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(71) Applicant: **Shenzhen Merit Technology Co., Ltd.**
Shenzhen, Guangdong 518105 (CN)

(72) Inventors:
- **LIU, Xiaoli**
  Shenzhen, Guangdong 518105 (CN)
- **LIANG, Feng**
  Shenzhen, Guangdong 518105 (CN)
- **GUO, Yu**
  Shenzhen, Guangdong 518105 (CN)

(74) Representative: **Herrero & Asociados, S.L.**
Edificio Aqua - Agustín de Foxá, 4-10
28036 Madrid (ES)

(54) **HEATING ASSEMBLY AND AEROSOL GENERATING DEVICE**

(57) Disclosed in the present invention are 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 used for accommodating and heating an aerosol generating substrate during power-on; the first electrode is arranged on an outer side surface of the heating body and has a first connection portion; and the second electrode is arranged, spaced apart from the first electrode, on the outer side surface of the heating body and has a second connecting portion, wherein the first connecting portion and the second connecting portion are located at the same end of the heating body. By means of the heating assembly and the aerosol generating device, a wiring path of a wire can be greatly simplified, the length of the wire can be shortened, and the manufacturing cost and difficulty can be effectively reduced.

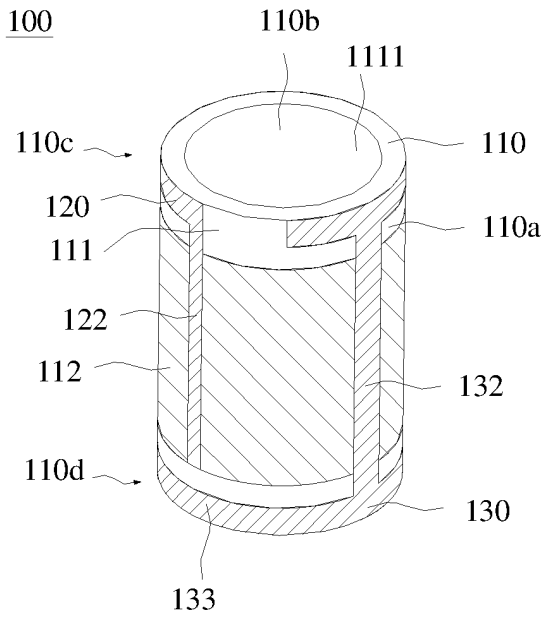

FIG. 6

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Description

CROSS-REFERENCES TO RELATED APPLICATIONS

[0001] The present application claims priority to Chinese patent application No. 2021108393386 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 and atomize an aerosol-forming substrate 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 heater, a conductive first electrode and a conductive second electrode. The heater is configured to receive an aerosol-forming substrate and heat the aerosol-forming substrate when energized. The conductive first electrode is arranged on the outer surface of the heater and includes a first connecting part. The conductive second electrode is spaced apart from the first electrode, arranged on the inner surface of the heater and includes a second connecting part. The first connecting part and the second connecting part are located at a same end of the heater.

[0008] In some embodiments, the heater includes a first end and a second end opposite to each other, and the first connecting part and the second connecting part are both arranged at the first end of the heater. The first electrode further includes at least one first extending part connected to the first connecting part, and the first extending part extends from the first connecting part toward the second end of the heater. The second electrode further includes at least one second extending part connected to the second connecting part, and the second extending part extends from the second connecting part toward the second end of the heater. A heating area is formed between the adjacent first extending part and the second extending part.

[0009] In some embodiments, the first extending part and/or the second extending part extend along the axial direction of the heater and are linear.

[0010] 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 heater to form an even number of heating areas.

[0011] In some embodiments, the distance between any adjacent first extending part and the second extending part is the same.

[0012] In some embodiments, the second electrode further includes a third connecting part, and the third connecting part is arranged on the second end and is connected to at least one second extending part.

[0013] In some embodiments, the quantity of the first extending part and the quantity of the second extending part are both one, the first extending part extends from the first connecting part to the second end, and the second extending part extends from the second connecting part to the second end, so as to form two heating areas.

[0014] In some embodiments, the quantity of the first extending part and the quantity of the second extending part are both two, and the two first extending parts are located at two ends of the first connecting part, so as to form four heating areas.

[0015] In some embodiments, the second electrode further includes a third connecting part. One of the two extending parts is connected to the third connecting part. The third connecting part is connected to the two second extending parts.

[0016] In some embodiments, the first extending part and the second extending part extend along the circumferential direction of the heater and are spiral.

[0017] In some embodiments, the extending path of the first extending part is consistent with the extending path of the second extending part.

[0018] In some embodiments, the first connecting part and the second connecting part are spaced apart from a heating layer of the heater.

[0019] In some embodiments, the first connecting part

and the second connecting part are spaced apart from a heating layer of the heater.

[0020] In some embodiments, the heater is in the shape of a hollow tube.

[0021] In some embodiments, the heater includes a base and a heating layer. The base includes a receiving cavity configured to receive the aerosol-forming substrate. The heating layer is arranged on the outer surface of the base and connected to the first electrode and the second electrode respectively, and configured to generate heat when energized to heat the aerosol-forming substrate.

[0022] In some embodiments, the base is in the shape of a hollow cylinder, and the material of the base is quartz or glass.

[0023] In some embodiments, the heating layer is an infrared heating layer.

[0024] In some embodiments, the heater further includes at least one 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 the outer surface of the aerosol-forming substrate and an inner surface of the receiving cavity.

[0025] In some embodiments, the first connecting part extends along the circumferential direction of the heater and has a notch.

[0026] In some embodiments, the second connecting part is located at the notch and the height of the second connecting part along the axial direction of the heater is consistent with the height of the first connecting part.

[0027] 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-forming substrate when energized; and the heating assembly is the heating assembly described above. The power supply assembly is electrically connected to the first connecting part and second connecting part, and configured to supply power to the heating assembly.

[0028] The heating assembly and aerosol-generating device are provided by the present disclosure. The heating assembly disposes the first connecting part for connecting with the positive electrode lead and the second connecting part for connecting with the negative electrode lead at the same end of the inner surface of the heater, 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 connecting the positive electrode lead and negative electrode lead at both ends, it greatly simplifies the wiring path of the wire, reduces the length of the wire, and production cost and manufacturing difficulty are effectively reduced.

BRIEF DESCRIPTION OF THE DRAWINGS

[0029] 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 an embodiment of the present disclosure.

FIG. 2 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. 3 is a schematic structural view of an overall structure of a heating assembly provided by an embodiment of the present disclosure.

FIG. 4 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. 5 is a schematic structural view of the outer side wall of a heating assembly unfolded along its axial direction provided by an embodiment of the present disclosure.

FIG. 6 is a schematic structural view of an overall structure of a heating assembly provided by an embodiment of the present disclosure.

FIG. 7 is a schematic structural view of the outer side wall of a heating assembly unfolded along its axial direction provided by an embodiment of the present disclosure.

FIG. 8 is a schematic structural view of an overall structure of a heating assembly provided by an embodiment of the present disclosure.

FIG. 9 is a schematic structural view of the outer side wall of the heating assembly shown in FIG. 8 unfolded along its axial direction provided an embodiment of the present disclosure.

FIG. 10 is a schematic structural view of an aerosol-generating device provided by an embodiment of the present disclosure.

DETAILED DESCRIPTION

[0030] 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.

[0031] 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.

[0032] 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 quantity 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.

[0033] 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 specification 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.

[0034] The present disclosure will be described in detail below with reference to the drawings and embodiments.

[0035] As illustrated in FIG. land FIG. 2, FIG. 1 shows a schematic structural view of a heating assembly 100 provided by an embodiment, FIG. 2 is a schematic structural view of the unfolded heating assembly 100 shown in FIG. 1. The present embodiment provides a heating assembly 100, and the heating assembly 100 is configured to receive and heat an aerosol-forming substrate when energized. The aerosol-forming substrate may be a plant grass substrate or a paste substrate. etc. 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 heater 110, a first electrode 120 and a second electrode 130.

[0037] The heater 110 is configured to accommodate the aerosol-forming substrate, and the heater 110 includes a heating material. The heater 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 use.

[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 source, thereby energizing the heater 110 to generate heat. The heater 110 has the outer surface 110a and an inner surface 110b. The conductive first electrode 120 and the conductive second electrode 130 are arranged on the outer surface 110a of the heater 110 at intervals and are electrically connected through a conductive heating layer.

[0039] The first electrode 120 includes a first connecting part 121, and the first connecting part 121 is configured to connect to the positive electrode lead. The second electrode 130 has a second connecting part 131, and the second connecting part 131 is configured to connect to the negative electrode lead. The first connecting part 121 and the second connecting part 131 are spaced apart from each other and arranged at the same end of the heater 110. The same end of the heater 110 refers to a first end of the heater 110 or a second end of the heater 110. In some embodiments, taking a plane which is perpendicular to the axial direction of the heater 110 and passes through a center point of the heater 110 as a boundary, a part of the heater 110 located on one side of the plane is the first end 110c of the heater 110, and a part of the heater 110 located on another side of the plane is the second end 110d of the heater 110. In the present embodiment, the heater 110 is in the shape of a hollow column and has the first end 110c and the second end 110d opposite to each other. The first connecting part 121 and the second connecting part 131 are spaced apart from each other and arranged at the first end 110c of the heater 110. Therefore, both the positive electrode lead and the negative electrode lead may be connected to the first connecting part 121 and the second connecting part 131 respectively at the same end of the heater 110. In other embodiments, the first connecting part 121 may be connected to the negative electrode lead, and the second connecting part 131 may be connected to the positive electrode lead.

[0040] The first electrode 120 and the second electrode 130 may be a conductive coating coated on the outer surface 110a of the heater 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 outer surface 110a of the heater 110 or a metal deposited on the outer surface 110a of the heater

110.

[0041] The heating assembly 100 provided by the present embodiment disposes the first connecting part 121 for connecting with the positive electrode lead and the second connecting part 131 for connecting with the negative electrode lead at the same end of the outer surface 110a of the heater 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 part 121 and the second connecting part 131 at opposite ends of an outer side wall of the heater 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 heater 110 may be entirely made of a conductive material, such as conductive ceramics, or may include an insulating base and a conductive heating layer disposed on a surface of the insulating base. In the present embodiment, the heater 110 includes a base 111 and a heating layer 112. The base 111 may be made of an insulating material, such as quartz glass, ceramics, mica or other high-temperature resistant materials, to prevent the first electrode 120 and the second electrode 130 from being short-circuited. When the substrate is quartz glass, quartz glass with a transparency of 80% or above may be adopted. The base 111 has a receiving cavity 1111, and the receiving cavity 1111 is configured to receive the aerosol-forming substrate. The receiving cavity 1111 has an opening at one end, to allow the aerosol-forming substrate to be inserted into or withdraw from the opening of the receiving cavity 1111. The base 111 may be in the shape of a hollow tube. In the present 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 heater 110 may evenly heat the aerosol-forming substrate. The first connecting part 121 and the second connecting part 131 both extend in an arc shape along the circumferential direction of the base 111. In some embodiments, the first connecting part 121 and the second connecting part 131 have the same length and are located axially along the base 111 at the same height.

[0043] In an embodiment, as illustrated in FIG. 3, a limiting member 113 may be arranged at an end of the base 111 and is configured to limit displacement of the aerosol-forming substrate, such that there is an airway formed between the aerosol-forming substrate and the inner surface of the receiving cavity 1111 during the process of the aerosol-forming substrate of being inserted into the receiving cavity 1111 from the opening. The airway may serve as a thermal-insulating layer, preventing the side wall of the base 111 from absorbing heat of the aerosol-forming substrate.

[0044] In some embodiment, the limiting member 113 defines a limiting opening 1131 in communication with the opening of the receiving cavity 1111, and the caliber of the limiting opening 1131 is smaller than the inner diameter of the receiving cavity 1111. The center of the limiting opening 1131 may be arranged on the axis of the receiving cavity 1111, so as to limit the aerosol-forming substrate in the middle of the heater 110.

the quantity of the limiting member 113 may be one. For example, in the embodiment as shown in FIG. 3, the limiting member 113 may be a convex ring close to the inner wall surface of one end of the receiving cavity 1111. The limiting member 113 may also be multiple. The multiple limiting members 113are 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 limiting members 113 along 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.

[0045] 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 form the limiting opening 1131 at the first end 110c of the base 111.

[0046] The heating film 111 may generate heat when energized, so as to heat the aerosol-forming substrate. The heating layer 112 is arranged around the outer surface 110a of the substrate 111, and is 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 heating layer 112 between the first electrode 120 and the second electrode 130, thereby generating heat. The heating layer 112 may be a metal layer, a conductive ceramic layer, or a conductive carbon layer. The shape of the heating layer 112 may be a continuous film, a porous mesh or a strip. In the present embodiment, the heating layer 112 is an infrared heating film. When the infrared heating film is energized, it radiates infrared waves to heat the aerosol-forming substrate in the receiving cavity 1111. The infrared heating wavelength is 2.5um~20um. Due to the characteristics of the aerosol-forming substrate, the heating temperature usually needs to be 350°Cor above, and the extreme value of energy radiation is mainly in the 3-5um band.

[0047] In other embodiments, the first electrode 120, the second electrode 130, and the heating layer 112 may also be located on the inner surface 110b of the heater 110, which is not limited to being located only on the outer surface 110a of the heater 110.

[0048] In an embodiment, as shown in FIG. 4, the first connecting part 121 is annular, extends along the circumferential direction of the heater 110 and has a notch 1211. In other words, the first connecting part 121 does not form a closed loop in the circumferential direction. The second connecting part 131 is located at a position of the first connecting part 121 away from an end surface of the first end 110c, such that the negative electrode lead may be connected to the second connecting part 131 without the need to be connected to the first connecting part 121, preventing being short-circuited due to the negative electrode lead contacting with the first connecting part 121, and facilitating wiring.

[0049] FIG. 4 shows three longitudinal positional relationships between the first connecting part 121 and the second connecting part 131. When the second electrode 130 is at position a, the second connecting part 131 is completely staggered with the notch 1211 along the axial direction of the heater 110. When the second electrode 130 is at position b, the second connecting part 131 and the notch 1211 are arranged facing each other in the axial direction of the heater 110. When the second electrode 130 is at position c, the second connecting part 131 is partially staggered with the notch 1211 along the axial direction of the heater 110. When the second electrode 130 is disposed at position b, the wiring is more easily connected to the second connecting part 131 through the notch 1211, and the wiring path of the wire is simpler.

[0050] In an embodiment, as illustrated in FIG. 2, both the first connecting part 121 and the second connecting part 131 may be regarded as circular rings with notches. One of the first connecting part 121 and the second connecting part 131 is arranged at the notch of the other of the first connecting part 121 and the second connecting part 131. For example, the entire second connecting part 131 is exposed through the notch 1211 along the axial direction of the heater 110, the second connecting part 131 is located at the position of the notch 1211, and its height is consistent with that of the first connecting part 121 in the axial direction of the heater 110. Further, the first connecting part 121 and the second connecting part 131 are flush with an end surface of the first end 110c of the heater 110. Therefore, the positive electrode lead and the negative electrode lead may be directly connected to the first connecting part 121 and the second connecting part 131. Thus, the wiring path of the wires is simpler, and the wiring way of the heating assembly 100 is simplified.

[0051] In the present embodiment, 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 part 121, and another end of the first extending part 122 extend from the first connecting part 121 toward the second end 110d of the heater 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 part 131, and another end extends from the second connecting part 131 toward the second end 110 d of the heater 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 heating layer 112. The first extending part 122 and the second extending part 132 are spaced apart, and the 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 part 121 and the first extending part 122 may be made of the same material and integrated together by printing or deposition. The second connecting part 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 part and the extending part is that the connecting part may be larger in size than the extending part, so as to facilitate welding or bonding with external wires.

[0052] The 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. The extending path 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.

[0053] In an embodiment, the first extending part 122 and the second extending part 132 are parallel, both extend along the axial direction of the heater 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. In the present embodiment, the extending parts are perpendicular to the connecting parts. In the embodiment shown in FIG. 1 and FIG. 2, the first connecting part 121 and the second connecting part 131 are evenly distributed circumferentially on the first end 110c of the base 111. The quantity 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 part 121, and another end extends to an end surface of the second end 110 d of the base 111. In other embodiments, the other end may extend to a position close to the end surface. One end of the second extending part 132 is located in the middle of the second connecting part 131, and another end extends to an end surface of the second end 110d of the base 111. In other embodiments, the other end may extend to a position close to the end surface. 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 heater 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 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.

[0054] As illustrated in FIG. 5, which is an unfolded schematic structural view of another heating assembly. In an embodiment, the second electrode 130 also includes a third connecting part 133, and third connecting part 133 is configured to connect to the negative electrode lead. The third connecting part 133 is arranged at the second end 110d of the heater 110 and is connected to the second extending part 132. The third connecting part 133 may extend circumferentially along the second end 110d of the heater 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 part 121 on the first end 110c, and the negative electrode lead may be connected to the second connecting part 131 on the first end 110c or the third connecting part 133 on the second end 110d. Therefore, the arranging of the third connecting part 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 part 133, and the third connecting part 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.

[0055] In an embodiment, at least one of the first connecting part 121, the second connecting part 131 and the third connecting part 133 is spaced apart from the heating layer 112 of the heater 110. When the heating layer 112 is connected to at least one of the first connecting part 121, the second connecting part 131 and the third connecting part 133, a part of the current may flow from the first connecting part 121 to the second extending part 132, or from the first extending part 122 to the second connecting part 131, or from the first extending part 122 to the third connecting part 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 part 121, the second connecting part 131 and the third connecting part 133 are all spaced apart from the heating layer 112 of the heater 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 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 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 part 133, both the first connecting part 121 and the second connecting part 131 are spaced apart from the heating layer 112 of the heater 110, and have the same distance from the heating layer 112 of the heater 110.

[0056] In an embodiment, as illustrated in FIG. 6 and FIG. 7, FIG. 6 is a schematic structural view of another heating assembly 100 and FIG. 7 is an unfolded schematic view of the heating assembly 100 shown in FIG.6. The first electrode 120 includes a plurality of first extending parts 122 connected to the first connecting part 121, and the second electrode 130 includes a plurality of second extending parts 132 connected to the second connecting part 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 heating layer 112 to form an even number of heating areas, with each heating area having a part of the heating layer 112.

[0057] When the quantity of the first extending parts 122 and the quantity 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 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 quantity of the first extending parts 122 and the quantity 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 heating layer 112 is not able to be fully utilized. Therefore, when

the quantity of the first extending parts 122 and the quantity 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 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 heating layer 112 may be avoided.

[0058] 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 heater 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.

[0059] 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 part 133. The first connecting part 121 is configured to connect to the positive electrode lead and also to connect the plurality of first extending parts 122. The third connecting part 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 part 133 is connected to each second extending part 132, and the third connecting part 133 forms a closed ring shape at the second end 110d of the heater, such that each heating area may be powered on.

[0060] In the embodiment as illustrated in FIG. 6 and FIG. 7, the quantity of the first extending part 122 and the second extending part 132 are both two. The two first extending parts 122 are respectively located at two ends of the first connecting part 121. One second extending part 132 is connected to the second connecting part 131 and the third connecting part 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 part 133. The third connecting part 133 is annularly arranged at the second end 110d of the heater 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 heater 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 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 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.

[0061] As illustrated in FIG. 8 and FIG. 9, which is a schematic structural view of another heating assembly 100 and FIG. 9 is an unfolded schematic view of the heating assembly 100 shown in FIG.8. In the embodiment shown in FIG. 8 and FIG. 9, the quantity of the first extending part 122 and the second extending part 132 are both one. The first extending part 122 and the second extending part 132 all extend spirally along the circumferential direction of the heater 110 and extend from the first end 110 c to the second end 110 d of the heater 110.

[0062] The 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 path of the first extending part 122 is consistent with that of the second extending part 132, and a separation distance between the first extending part 122 and the second extending part 132 is equal everywhere. The first extending part 122, the second extending part 132 and the heating layer 112 are evenly distributed on the outer surface 110a of the heater 110, such that the heating layer 112 may evenly heat the aerosol-forming substrate.

[0063] As first extending part 122, the second extending part 132 spirally extend to the second end 110d of the heater 110, both ends of the first extending part 122 may be served as the first connecting part 121, and two ends of the second extending part 132 may be served as the second connecting part 131. Alternatively, the first connecting part 121 and the second connecting part 131 are arranged at both the first end 110c and the second end 110d, and the first connecting part 121 is connected to one end of the first extending part 122, and the second connecting part 131 is connected to one end of the extending 132.

[0064] FIG. 10 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.

[0065] 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.

[0066] 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, and the heating assembly 100 is inserted into the through hole 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, 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 heater 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.

[0067] 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.

[0068] The power supply assembly 230 is connected to the first connecting part 121 and the second connecting part 131 of 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.

[0069] 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 part 121 for connecting to the positive electrode lead and a second connecting part 131 for connecting to the negative electrode lead. The first connecting part 121 and second connecting part 131 are arranged at the same end on the outer surface 110a of the heater 110, such that the positive electrode lead and the negative electrode may be connected at the same end of the heater 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 part 121 and the second connecting part 131 at the opposite ends of the outer side wall of the heater 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.

[0070] 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 heater, configured to receive an aerosol-forming substrate and heat the aerosol-forming substrate when energized;
a conductive first electrode, arranged on the outer surface of the heater and comprising a first connecting part; and
a conductive second electrode, spaced apart from the first electrode, arranged on the outer surface of the heater and comprising a second connecting part, wherein the first connecting part and the second connecting part are located at a same end of the heater.

2. The heating assembly according to claim 1, wherein the heater comprises a first end and a second end opposite to each other, and the first connecting part and the second connecting part are both arranged at the first end; the first electrode further comprises at least one first extending part connected to the first connecting part, the first extending part extends from the first connecting part toward the second end; the second electrode further comprises at least one second extending part connected to the second connecting part, the second extending part extends from the second connecting part toward the second end, and a heating area is formed between the adjacent first extending part and the second extending part.

3. The heating assembly according to claim 2, wherein the first extending part and/or the second extending part extend along the axial direction of the heater and are linear.

4. The heating assembly according to claim 3, 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 heater to form an even number of heating areas.

5. The heating assembly according to claim 4, wherein the distance between any adjacent first extending part and the second extending part is the same.

6. The heating assembly according to claim 2, wherein the second electrode further comprises a third connecting part arranged on the second end and connected to at least one second extending part.

7. The heating assembly according to claim 2, wherein the quantity of the first extending part and the quantity of the second extending part are both one, the first extending part extends from the first connecting part to the second end, and the second extending

part extends from the second connecting part to the second end, so as to form two heating areas.

8. The heating assembly according to claim 6, wherein the quantity of the first extending part and the quantity of the second extending part are both two, the two first extending parts are located at two ends of the first connecting part, so as to form four heating areas, and the third connecting part is connected to the two second extending parts.

9. The heating assembly according to claim 2, wherein the first extending part and the second extending part extend along the circumferential direction of the heater and are spiral.

10. The heating assembly according to claim 9, wherein the quantity of the first extending part and the quantity of the second extending part are both one, the heating area is located between the first extending part and the second extending part, and the shape of the heating area is spiral.

11. The heating assembly according to claim 9, wherein the extending path of the first extending part is consistent with the extending path of the second extending part.

12. The heating assembly according to claim 1, wherein the first connecting part and the second connecting part are spaced apart from a heating layer of the heater.

13. The heating assembly according to claim 6, wherein the first connecting part, the second connecting part and the third connecting part are spaced apart from a heating layer of the heater.

14. The heating assembly according to claim 1, wherein the heater is in the shape of a hollow tube.

15. The heating assembly according to claim 1, wherein the heater comprises:

a base, comprising a receiving cavity configured to receive the aerosol-forming substrate; and
a heating layer, arranged on the outer surface of the base and connected to the first electrode and the second electrode respectively, and configured to generate heat when energized to heat the aerosol-forming substrate.

16. The heating assembly according to claim 15, wherein the base is in the shape of a hollow cylinder, and the material of the base is quartz or glass.

17. The heating assembly according to claim 15, wherein the heating layer is an infrared heating layer.

18. The heating assembly according to claim 15, wherein the heater further comprises at least one 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 the outer surface of the aerosol-forming substrate and an inner surface of the receiving cavity.

19. The heating assembly according to claim 1, wherein the first connecting part extends along the circumferential direction of the heater and has a notch.

20. The heating assembly according to claim 19, wherein the second connecting part is located at the notch and the height of the second connecting part along the axial direction of the heater is consistent with the height of the first connecting part.

21. An aerosol-generating device, **characterized by** comprising:

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

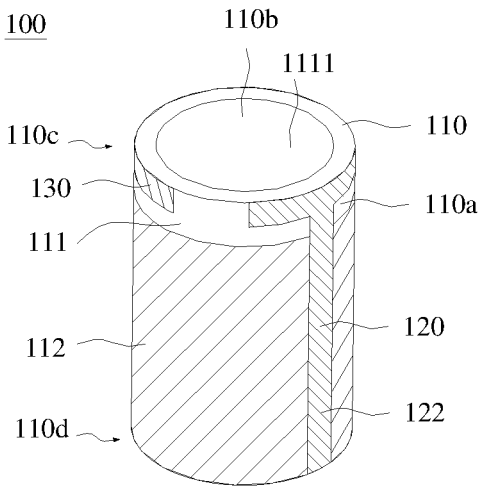
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FIG. 1

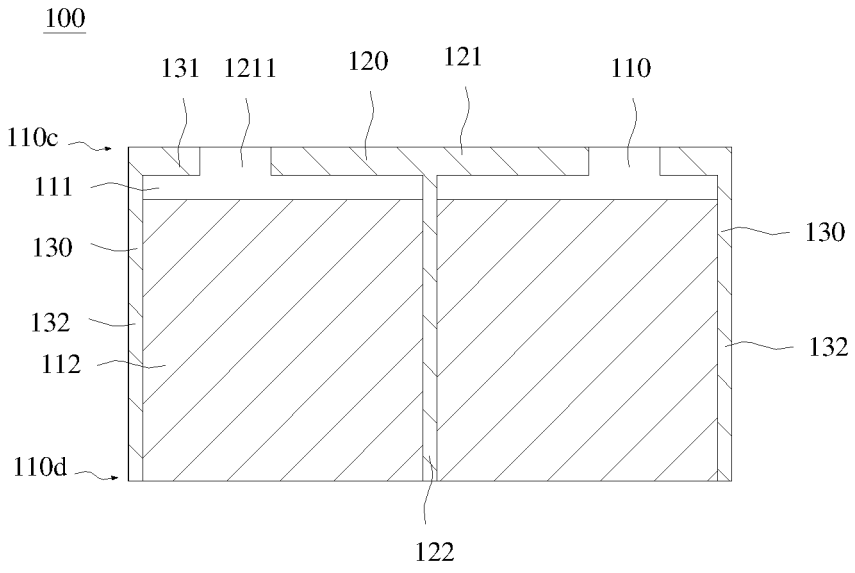
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FIG. 2

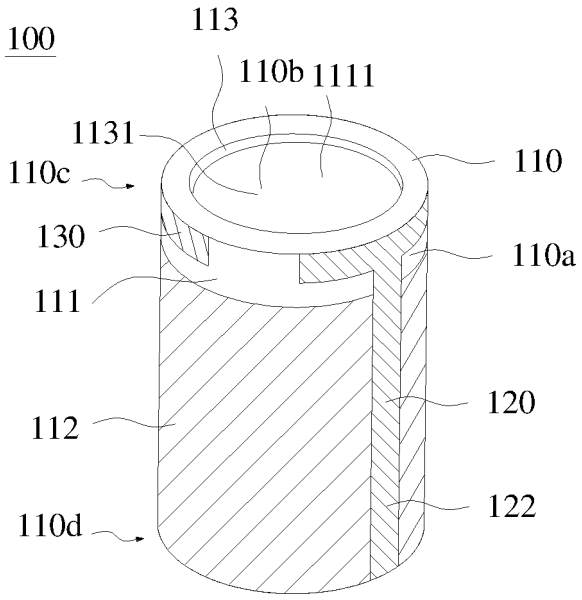
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FIG. 3

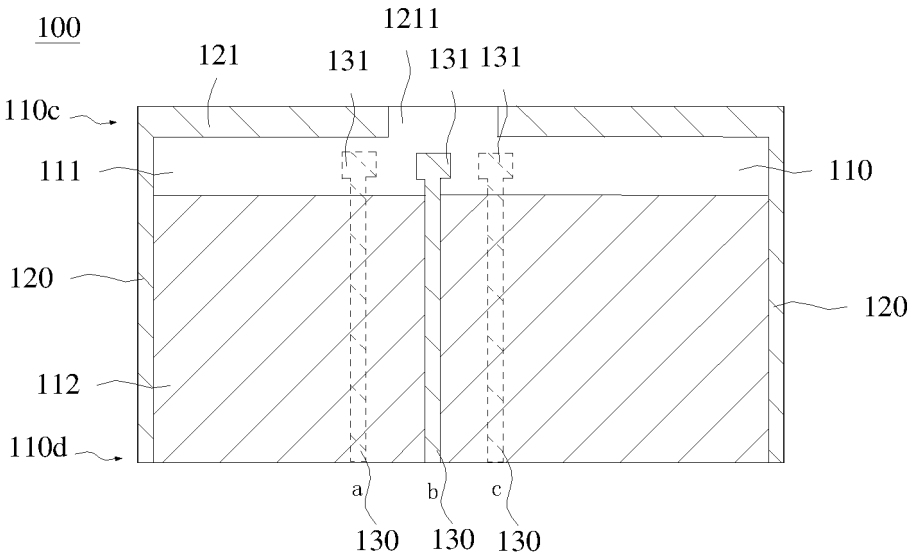
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FIG. 4

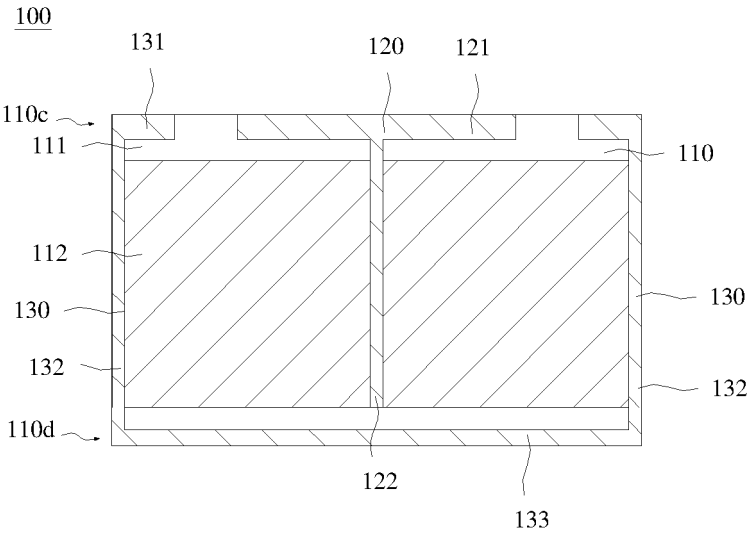
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FIG. 5

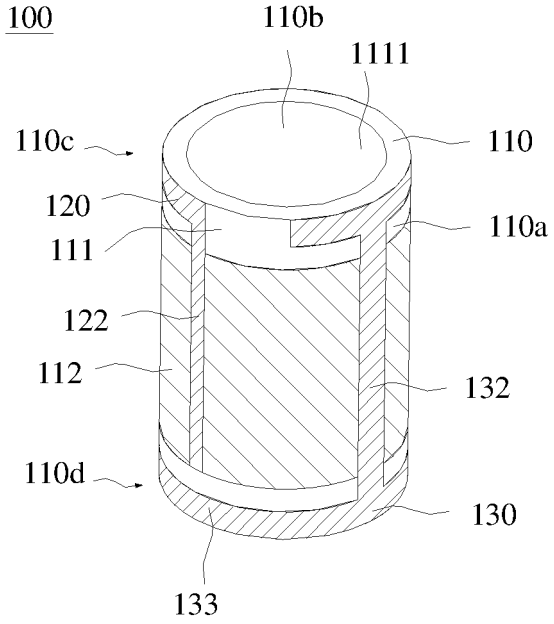
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FIG. 6

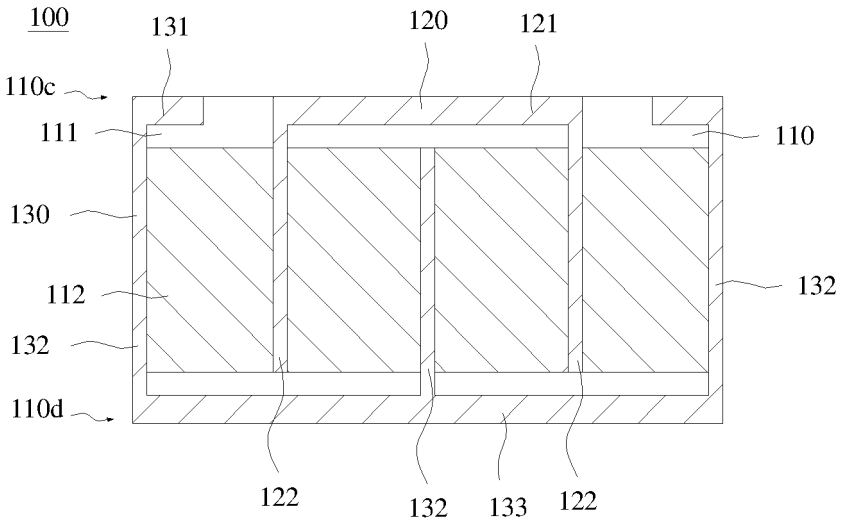
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FIG. 7

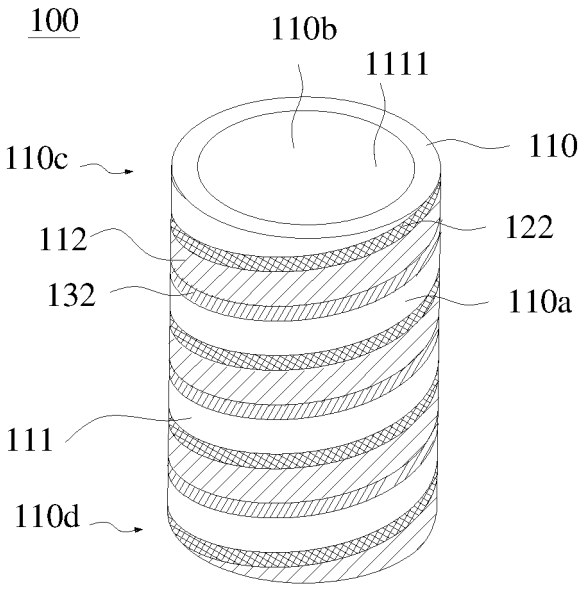
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FIG. 8

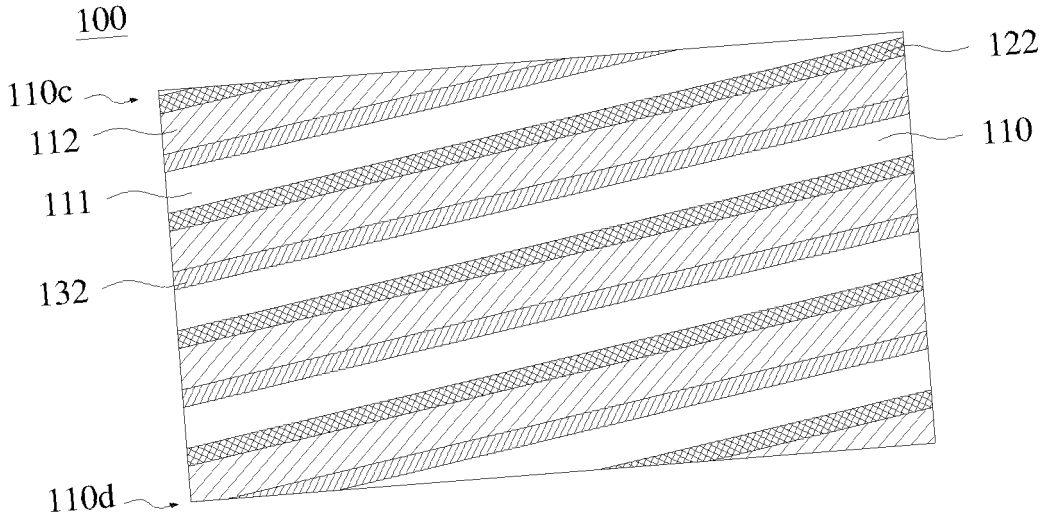

FIG. 9

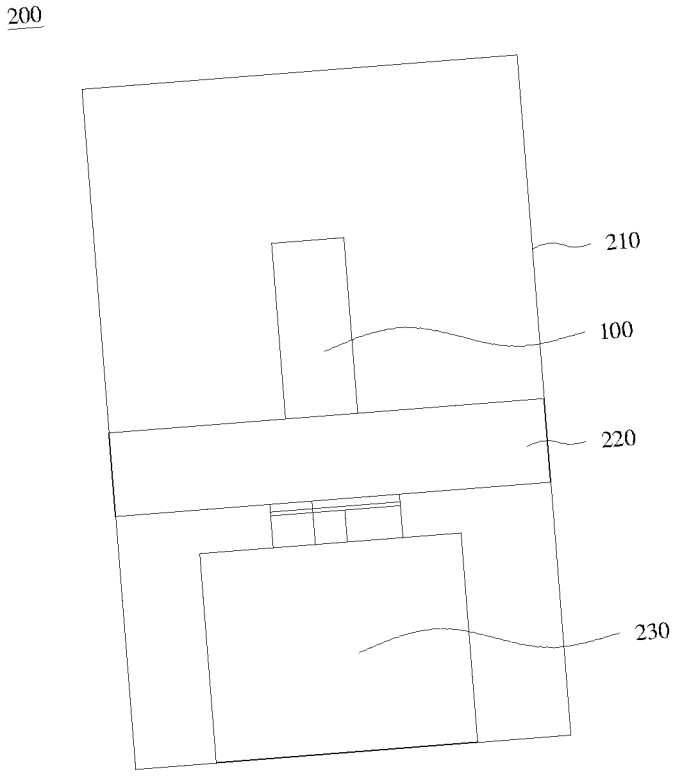

FIG. 10

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2022/097723

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; CNKI; WPABSC; ENTXTC; WPABS; ENTXT: 深圳麦时科技有限公司, 电极, 第一电极, 第二电极, 正极, 负极, 红外, 同一端, 同侧, 螺旋, heater, electrode, positive pole, positive electrode, negative electrode, negative pole, infrared

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 113647691 A (SHENZHEN MAISHI TECHNOLOGY CO., LTD.) 16 November 2021 (2021-11-16) claims 1-21	1-21
X	CN 213344347 U (SHENZHEN FIRST UNION TECHNOLOGY CO., LTD.) 04 June 2021 (2021-06-04) description, paragraphs [0015] and [0032]-[0062], and figures 2-7	1-21
A	CN 113080519 A (SHENZHEN FIRST UNION TECHNOLOGY CO., LTD.) 09 July 2021 (2021-07-09) entire document	1-21
A	CN 112841741 A (SHENZHEN FIRST UNION TECHNOLOGY CO., LTD.) 28 May 2021 (2021-05-28) entire document	1-21
A	CN 113080520 A (SHENZHEN FIRST UNION TECHNOLOGY CO., LTD.) 09 July 2021 (2021-07-09) entire document	1-21

☐ Further documents are listed in the continuation of Box C. ☑ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
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"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
"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
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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
04 July 2022	**20 July 2022**
Name and mailing address of the ISA/CN **China National Intellectual Property Administration (ISA/CN)** **No. 6, Xitucheng Road, Jimenqiao, Haidian District, Beijing 100088, China** Facsimile No. **(86-10)62019451**	Authorized officer Telephone No.

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

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2022/097723

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN 113647691 A	16 November 2021	CN 216220207 U	08 April 2022
CN 213344347 U	04 June 2021	WO 2022012678 A1	20 January 2022
CN 113080519 A	09 July 2021	WO 2021129675 A1	01 July 2021
CN 112841741 A	28 May 2021	WO 2021104471 A1	03 June 2021
CN 113080520 A	09 July 2021	WO 2021129679 A1	01 July 2021
		CN 212279891 U	05 January 2021

Form PCT/ISA/210 (patent family annex) (January 2015)

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- CN 2021108393386 **[0001]**