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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 GENERATION APPARATUS**

(57) A heating assembly (10) and an aerosol generation apparatus. The heating assembly (10) comprises a heating body (11), an electrode (12) and an electrode connecting member (13). The heating body (11) is used for accommodating and heating an aerosol generation substrate when powered on; the electrode (12) is arranged on the heating body (11) and is electrically connected to the heating body (11); and the electrode connecting member (13) is electrically connected to the electrode (12), wherein the electrode connecting member (13) is flake-like and has a first end and a second end, which are arranged spaced apart from each other in a bending direction. The heating assembly (10) and the aerosol generation apparatus can prevent friction between the electrode connecting member (13) and the heating body (11) during assembly, thereby preventing the electrode connecting member (13) from scratching a heating film (114) or a heating coating layer on the surface of the heating body (11).

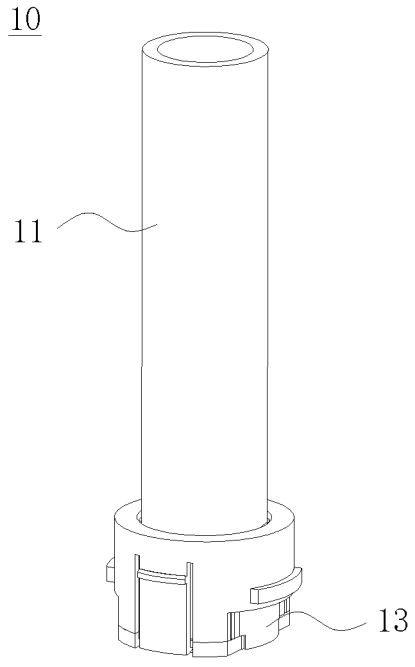

FIG. 1

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Description

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] The present disclosure claims priority to Chinese Patent Application No. 202122765750.6 filed November 11, 2021, which is herein incorporated by reference in its entirety.

TECHNICAL FIELD

[0002] The present disclosure relates to the technical field of electronic atomization devices, in particular to a heating assembly and an aerosol generation apparatus.

BACKGROUND

[0003] An aerosol generation apparatus heats an aerosol generation substrate in a baking mode of heat not burning (HNB), so as to generate aerosols that can be inhaled by a user. Compared with a mode of directly burning the substrate to produce aerosols, the baking mode of HNB may significantly reduce harmful components in the aerosols, in this way, the aerosol generation apparatus may have a relatively broad market demand.

[0004] The aerosol generation apparatus usually has a heating assembly. After the aerosol generation substrate is inserted into the aerosol generation apparatus, a heating element of the heating assembly is powered on and heated, then the aerosol generation substrate is heated. An electrode of the heating element may be welded with a leading wire, or be arranged with an electrode connecting element, and so on, so as to achieve electric connection. However, in the mode of achieving electric connection of the electrode by arranging the electrode connecting element, the electrode connecting element is difficult to be assembled, and is easy to scratch a heating film or a heating coating on the surface of the heating element.

SUMMARY

[0005] A heating assembly and an aerosol generation apparatus provided by some embodiments of the present disclosure may solve the problem that the electrode connecting element is difficult to be assembled and the heating element is easy to scratch the heating element during assembly.

[0006] To solve the aforesaid technical problems, some embodiments of the present disclosure provide a heating assembly. The heating assembly includes: a heating element, configured to receive and heat an aerosol generation substrate in response to being powered on; one or more electrodes, arranged on the heating element and electrically connected to the heating element; and one or more electrode connecting elements, electrically connected to the one or more electrodes, each of the one or more electrode connecting elements is sheet-shaped and includes a first endportion and a second end portion spaced apart from each other in a bending direction of each of the one or more electrode connecting elements.

[0007] In some embodiments, the heating element includes a first end and a second end opposite to each other, the one or more electrodes include two electrodes, the two electrodes include a first electrode and a second electrode spaced apart from each other, and a connecting portion of the first electrode and a connecting portion of the second electrode are both arranged on the first end of the heating element, the one or more electrode connecting elements include two electrode connecting elements, the two electrode connecting elements include a first electrode connecting element and a second electrode connecting element spaced apart from each other, the first electrode connecting element is arranged on the first end of the heating element and electrically connected to the connecting portion of the first electrode, and the second electrode connecting element is arranged on the first end of the heating element and electrically connected to the connecting portion of the second electrode.

[0008] In some embodiments, the heating assembly further includes a fixing base, the fixing base is arranged on an end of the heating element and fixes each of the one or more electrode connecting elements.

[0009] In some embodiments, the fixing base includes a base and an upper cover, the fixing base is sleeved on an end of the heating element with the one or more electrodes, each of the one or more electrode connecting elements is sandwiched between the upper cover and the base, a first portion of each of the one or more electrode connecting elements is exposed and abuts against a corresponding electrode of the one or more electrodes, and a second portion of each of the one or more electrode connecting elements is exposed and configured to be connected to an external power supply.

[0010] In some embodiments, the base includes a first annular sidewall, the first annular sidewall is sleeved on the end of the heating element with the one or more electrodes, the first annular sidewall defines one or more first openings configured to expose each of the one or more electrodes, the first portion of each of the one or more electrode connecting elements is exposed through a corresponding first opening of the one or more first openings and abuts against the corresponding electrode, the upper cover is sleeved on the outside of the base, and at least part of the upper cover cooperates with the base to sandwich each of the one or more electrode connecting elements.

[0011] In some embodiments, one end of the first annular sidewall is sleeved on the end of the heating element with the one or more electrodes, the other end of the first annular sidewall is suspended, and the second portion of each of the one or more electrode connecting elements is arranged on a suspended portion of the first annular sidewall.

[0012] In some embodiments, the heating element is

cylinder-shaped, a heating film is arranged on the surface of the heating element, each of the one or more electrodes is arranged on the outer surface of the heating element and electrically connected to the heating film, and each of the one or more electrode connecting elements is a curved metal sheet.

[0013] In some embodiments, the radian of the curved metal sheet is less than 180 degrees.

[0014] In some embodiments, the curved metal sheet includes a body portion and one or more first abutting portions connected to a first side edge of the body portion, an end of each of the one or more first abutting portions away from the body portion is bent towards the heating element to form an elastic contactor, and the elastic contactor is exposed through the corresponding first opening and abuts against the corresponding electrode.

[0015] In some embodiments, the curved metal sheet further includes a plurality of first extending portions connected to the first side edge of the body portion, the one or more first abutting portions include a plurality of first abutting portions, and the plurality of first extending portions and the plurality of first abutting portions are alternately arranged on the first side edge one by one.

[0016] In some embodiments, the curved metal sheet further includes a protruding portion connected to a second side edge of the body portion opposite to the first side edge of the body portion, the upper cover defines a second opening, and the protruding portion is exposed through the second opening.

[0017] To solve the aforesaid technical problems, some embodiments of the present disclosure provide an aerosol generation apparatus. The aerosol generation apparatus includes: a heating assembly, configured to heat an aerosol generation substrate after being powered on; and a power supply assembly, electrically connected to the heating assembly, and configured to power the heating assembly; the heating assembly is any one of the heating assemblies described above.

[0018] In some embodiments, the power supply assembly includes: a bracket; a control circuit board, arranged in the bracket; one or more conductive elements, fixed in the bracket, each of the one or more conductive elements is electrically connected to the control circuit board; and the heating assembly is arranged in the bracket, and each of the one or more conductive elements abuts against a corresponding electrode connecting element of the one or more electrode connecting elements.

[0019] In some embodiments, the heating assembly is any one of the heating assemblies described above; and each of the one or more conductive elements includes a main portion and a second abutting portion connected to each other, the main portion is fixedly connected to the bracket, and the second abutting portion abuts against the second portion of the corresponding electrode connecting element.

[0020] In some embodiments, the one or more conductive elements include two conductive elements spaced apart from each other, the second abutting portion of each of the two conductive elements is bent towards the corresponding electrode connecting element, a convex surface of the second abutting portion of each of the two conductive elements faces the corresponding electrode connecting element, and the second abutting portion of each of the two conductive elements is elastic.

[0021] In the heating assembly and the aerosol generation apparatus provided by some embodiments of the present disclosure, the heating assembly includes a heating element, one or more electrodes, and one or more electrode connecting elements. The heating element is configured to receive an aerosol generation substrate and heat the aerosol generation substrate when being powered on. The one or more electrodes are arranged on the heating element and electrically connected to the heating element. The one or more electrode connecting elements are electrically connected to the one or more electrodes, and each of the one or more electrode connecting elements is sheet-shaped and includes a first end portion and a second end portion spaced apart from each other in a bending direction of each of the one or more electrode connecting elements. Compared with the mode in which an annular electrode connecting element is sleeved on the heating element, in the heating assembly and the aerosol generation apparatus provided by some embodiments of present disclosure, each electrode connecting element is sheet-shaped, and has a first end portion and a second end portion spaced apart from each other along the bending direction of each electrode connecting element. That is, each electrode connecting element is in the shape of a non-annular sheet. When being assembled, each electrode connecting element may be electrically connected to the corresponding electrode on the heating element by the way of attaching to the heating element, instead of being sleeved on the heating element, in this way, the mounting process may be simplified, the friction between each electrode connecting element and the heating element may be avoided during assembly, thereby avoiding the heating film on the surface of the heating element from being scratched.

BRIEF DESCRIPTION OF THE DRAWINGS

[0022] To describe the technical solutions in embodiments of the present disclosure more clearly, the following briefly describes the accompanying drawings required for describing the embodiments of the present disclosure. Apparently, the accompanying drawings in the following description show only some embodiments of the present disclosure, and those skilled in the art may still derive other accompanying drawings from these accompanying drawings without paying any creative efforts.

FIG. 1 is a schematic structural view of a heating assembly according to some embodiments of the present disclosure.

FIG. 2 is a schematic structural view of a heating

element and an electrode according to some embodiments of the present disclosure.

FIG. 3 is a schematic structural view of a heating element and an electrode according to some embodiments of the present disclosure.

FIG. 4 is a schematic structural view of a heating assembly according to some embodiments of the present disclosure.

FIG. 5 is a schematic exploded structural view of FIG. 1.

FIG. 6 is a schematic structural view of a base according to some embodiments of the present disclosure.

FIG. 7 is a schematic structural view of an upper cover according to some embodiments of the present disclosure.

FIG. 8 is a schematic structural view of a curved metal sheet according to some embodiments of the present disclosure.

FIG. 9 is a schematic structural view of mounting an electrode connecting element shown in FIG. 5 on a base.

FIG. 10 is another schematic structural view of the heating assembly shown in FIG. 1 viewed from another angle.

FIG. 11 is a schematic structural view of an aerosol generation apparatus and an aerosol generation substrate according to some embodiments of the present disclosure.

FIG. 12 is a schematic structural view of some assemblies of an aerosol generation apparatus according to some embodiments of the present disclosure.

FIG. 13 is a schematic structural view of a conductive element according to some embodiments of the present disclosure.

FIG. 14 is a schematic structural view of a conductive element and a heating assembly according to some embodiments of the present disclosure.

DETAILED DESCRIPTIONS

[0023] The technical solutions in the embodiments of the present disclosure are clearly and completely described below with reference to the accompanying drawings in the embodiments of the present disclosure. Apparently, the described embodiments are merely some rather than all of the embodiments of the present disclosure. All other embodiments obtained by those skilled in the art based on the embodiments of the present disclosure without creative efforts shall fall within the protection scope of the present disclosure.

[0024] In the following descriptions, specific details, such as specific system structure, interface, technology, etc., are proposed for explanation rather than limitation, so as to thoroughly understand the present disclosure.

[0025] The terms "first", "second", and "third" in the embodiments of the present disclosure are only used for descriptive purposes, and cannot be understood as indicating or implying relative importance or implicitly indicating the number of indicated technical features. Thus, the features defined with "first", "second", and "third" may explicitly or implicitly include at least one of the features. In the description of the present application, "a plurality of' means at least two, e.g., two, three, etc., unless specifically defined otherwise. All directional indications (such as up, down, left, right, front, back) in the embodiments of the present disclosure are only configured to account for relative positional relationships, motion conditions, etc., between components in a particular orientation (as shown in the drawings), if the particular orientation changed, correspondingly changes the directional indications. In addition, the terms "including" and "having" and any variations thereof are intended to cover non-exclusive inclusions. 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 includes unlisted steps or units, or optionally also includes other steps or units inherent to these processes, methods, products or equipment.

[0026] Mentioning "embodiments" herein means that a specific feature, structure, or characteristic described in conjunction with the embodiments may be included in at least one embodiment of the present disclosure. The appearances of the phrase 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. It is explicitly and implicitly understood by those skilled in the art that the embodiments described herein may be combined with other embodiments.

[0027] The present disclosure will be described in detail below in combination with the drawings and embodiments.

[0028] As shown in FIG. 1, FIG. 1 is a schematic structural view of a heating assembly 10 according to some embodiments of the present disclosure. Some embodiments of the present disclosure provide a heating assembly 10. The heating assembly 10 is configured to receive an aerosol generation substrate and heat the aerosol generation substrate when being powered on. The aerosol generation substrate may be plant-leaf substrate or paste-like substrate. The aerosol generation substrate may be wrapped in and used together with aluminum foil, paper, and so on.

[0029] The heating assembly 10 includes a heating element 11, one or more electrodes 12 (which are not shown in FIG. 1), and one or more electrode connecting elements 13. In some embodiments, the heating element 11 is configured to receive the aerosol generation substrate, and the heating element 11 includes heating materials. The heating element 11 may not only support the aerosol generation substrate received therein, but also be heated when being powered on, and heat the aerosol generation substrate received therein, in this way, aerosols may be generated for a user.

[0030] As shown in FIGS. 2 and 3, FIG. 2 is a schematic structural view of the heating element 11 and the one or more electrodes 12 according to some embodiments of the present disclosure, and FIG. 3 is a schematic structural view of a heating element 11 and the one or more electrodes 12 according to some embodiments of the present disclosure. Each of the one or more electrodes 12 is arranged on the heating element 11 and is electrically connected to the heating element 11. The one or more electrodes 12 may be arranged on the outer side surface of the heating element 11 or may be arranged on the inner side surface of the heating element 11. In the following embodiments, the one or more electrodes 12 are arranged on the outer side surface of the heating element 11 as an example for description.

[0031] The one or more electrodes 12 include two electrodes, and the two electrodes include a first electrode 121 and a second electrode 122. The first electrode 121 and the second electrode 122 are spaced apart from each other on the heating element 11. The first electrode 121 may be configured to be electrically connected to a positive pole of an external power supply, and the second electrode 122 may be configured to be electrically connected to a negative pole of the external power supply. In some embodiments, the first electrode 121 may be configured to be connected to the negative pole of the external power supply, and the second electrode 122 may be configured to be connected to the positive pole of the external power supply. In this way, the heating assembly 10 may be powered by the external power supply, and the heating element 11 may be powered on and heated.

[0032] Each of the first electrode 121 and the second electrode 122 may be a conductive coating coated on the heating element 11. The conductive coating may be a metal coating, a conductive silver paste, a conductive tape, and so on, or may be metals deposited on the surface of the heating element 11, such as gold film, aluminum film, or copper film.

[0033] Each of the first electrode 121 and the second electrode 122 has a connecting portion 123. Each connecting portion 123 is configured to be electrically connected to a corresponding electrode connecting element 13 of the one or more electrode connecting elements 13, thereby being electrically connected to the external power supply. The connecting portion 123 of the first electrode 121 and the connecting portion 123 of the second electrode 122 may be spaced apart from each other on the same end of the heating element 11 (as shown in FIG. 2), or may be respectively arranged on two ends of the heating element 11 (as shown in FIG. 3).

[0034] In some embodiments, the heating element 11 has a first end 111 and a second end 112 opposite to each other. A plane perpendicular to the axial direction of the heating element 11 and passing through the center point of the heating element 11 is taken as a boundary, a portion of the heating element 11 located on one side of the plane is the first end 111 of the heating element 11, and the other portion of the heating element 11 located on the other side of the plane is the second end 112 of the heating element 11.

[0035] In the embodiments shown in FIG. 2, the heating element 11 is a hollow column. The connecting portion 123 of the first electrode 121 and the connecting portion 123 of the second electrode 122 are spaced apart from each other on the first end 111 of the heating element 11. Each of the first electrode 121 and the second electrode 122 also has a first extending portion 124 connected to the connecting portion 123 thereof. One end of the first extending portion 124 is connected to the connecting portion 123, and the other end of the first extending portion 124 is extended from the connecting portion 123 towards the second end 112 of the heating element 11. After the first electrode 121 and the second electrode 122 are powered on, there is a current flowing through a heating zone between the first extending portion 124 of the first electrode 121 and the first extending portion 124 of the second electrode 122, and the heating zone heats the aerosol generation substrate.

[0036] In the embodiments shown in FIG. 3, each of the first electrode 121 and the second electrode 122 only has the connecting portion 123, the connecting portion 123 of the first electrode 121 is arranged on the first end 111 of the heating element 11, and the connecting portion 123 of the second electrode 122 is arranged on the second end 112 of the heating element 11. The connecting portion 123 of the first electrode 121 and the connecting portion 123 of the second electrode 122 are both annular-shaped. After the first electrode 121 and the second electrode 122 are powered on, there is a current flowing through a heating zone between the first electrode 121 and the second electrode 122.

[0037] The heating element 11 may be formed by conductive materials as a whole, such as conductive ceramics, or may include an insulating base body 113 and a conductive heating film 114 arranged on the surface of the insulating base body 113. In some embodiments, the heating element 11 includes a base body 113 and a heating film 114.

[0038] The base body 113 may be made of insulating materials. The base body 113 may be insulating materials with high thermostability, such as quartz glass, ceramic, mica, and so on, so to prevent short circuit between the first electrode 121 and the second electrode 122. The base body 113 has a receiving chamber 1131. The receiving chamber 1131 is configured to receive the aerosol generation substrate. One end of the receiving chamber 1131 has an opening, in this way, the aerosol generation substrate may be inserted into or retreated from the receiving chamber 1131 through the opening. The base body 113 may be a hollow tube. In some embodiments, the base body 113 is a hollow column, and is cylinder-shaped.

[0039] The heating film 114 may generate heat when being powered on, so as to heat the aerosol generation substrate. The heating film 114 may be arranged around

the outer surface of the base body 113 and connected to each of the first electrode 121 and the second electrode 122. After the first electrode 121 and the second electrode 122 are powered on, there is a current flowing through the heating film 114 between the first electrode 121 and the second electrode 122, and heat is generated. The heating film 114 may be a metal layer, a conductive ceramic layer, or a conductive carbon layer. The heating film 114 may be a continuous film, may be porous mesh-shaped, or may be strip-shaped.

[0040] As shown in FIG. 4, FIG. 4 is a schematic structural view of a heating assembly 10 according to some embodiments of the present disclosure. The heating assembly 10 includes one or more electrode connecting elements 13. The one or more electrode connecting elements 13 are electrically connected to the one or more electrodes 12 (which are not shown in FIG. 4) on the heating element 11. In some embodiments, the one or more electrode connecting elements 13 include two electrode connecting elements 13, and the two electrode connecting elements 13 include a first electrode connecting element 131 and a second connecting element 132 spaced apart from each other. In some embodiments, the connecting portion 123 of the first electrode 121 and the connecting portion 123 of the second electrode 122 are both arranged on the first end 111 of the heating element 11. The first electrode connecting element 131 is arranged on the first end 111 of the heating element 11, and is electrically connected to the connecting portion 123 of the first electrode 121. The second electrode connecting element 132 is arranged on the first end 111 of the heating element 11, and is electrically connected to the connecting portion 123 of the second electrode 122.

[0041] In some embodiments, the connecting portion 123 of the first electrode 121 is arranged on the first end 111 of the heating element 11, and the connecting portion 123 of the second electrode 122 is arranged on the second end 112 of the heating element 11. The first electrode connecting element 131 is arranged on the first end 111 of the heating element 11, and is electrically connected to the connecting portion 123 of the first electrode 121. The second electrode connecting element 132 is arranged on the second end 112 of the heating element 11, and is electrically connected to the connecting portion 123 of the second electrode 122.

[0042] Each electrode connecting element 13 is sheet-shaped. Each electrode connecting element 13 has a first end portion and a second end portion spaced apart from each other. The first end portion and the second end portion of each electrode connecting element 13 are spaced apart from each other, and each electrode connecting element 13 is in the shape of a non-annular sheet. That is, each electrode connecting element 13 is not enclosed to form a ring. In some embodiments, the heating element 11 is cylinder-shaped, and each electrode connecting element 13 may be curved. That is, each electrode connecting element 13 is bent, and the bent shape of each electrode connecting element 13 is similar to the shape of the heating element 11. In this way, each curved electrode connecting element 13 may be attached to the surface of the heating element 11 and electrically connected to a corresponding electrode 12 of the electrodes 12 on the heating element 11. In some embodiments, the shape of the heating element 11 may be similar to a cylinder, or the heating element 11 may be prism-shaped, and so on. The shape of each electrode connecting element 13 may also be similar to the shape of the heating element 11, as long as each electrode connecting element 13 is in the shape of a non-annular sheet. Each electrode connecting element 13 may be made of conductive materials, for example, each electrode connecting element 13 may be a metal conductive sheet.

[0043] Compared with the mode in the related art in which an annular electrode connecting element is sleeved on the heating element 11, in the heating assembly 10 and the aerosol generation apparatus provided by some embodiments of present disclosure, each electrode connecting element 13 is sheet-shaped, and has a first end portion and a second end portion spaced apart from each other along the bending direction of each electrode connecting element 13. That is, each electrode connecting element 13 is in the shape of a non-annular sheet. When being assembled, each electrode connecting element 13 may be electrically connected to the corresponding electrode 12 on the heating element 11 by the way of attaching to the heating element 11, instead of being sleeved on the heating element 11, in this way, the friction between each electrode connecting element 13 and the heating element 11 may be avoided during assembly, thereby avoiding the heating film 114 on the surface of the heating element 11 from being scratched. In some embodiments, each electrode connecting element 13 is a curved metal sheet, and the radian of the curved metal sheet is less than 180 degrees. On one hand, the radian is less than 180 degrees, it is easy for each electrode connecting element 13 to be attached to the surface of the cylindrical heating element 11. On the other hand, when the two electrode connecting elements 13 are arranged on the same end of the cylindrical heating element 11, the two electrode connecting elements 13 may be arranged opposite to each other and spaced apart from each other, in this way, short circuit may be avoided.

[0044] As shown in FIG. 5, FIG. 5 is a schematic exploded structural view of FIG. 1. The heating assembly 10 also includes a fixing base 14. The fixing base 14 is arranged on the end of the heating element 11 which is provided with the electrodes 12 and is configured to fix the electrode connecting elements 13. In some embodiments, the first electrode 121 and the second electrode 122 on the heating element 11 are both arranged on the first end 111 of the heating element 11. The fixing base 14 is also arranged on the first end 111 of the heating element 11 and configured to fix the first electrode connecting element 131 and the second electrode connecting element 132. Each electrode connecting element 13

is non-annular, and therefore cannot be fixed by being sleeved on the heating element 11. Each electrode connecting element 13 is needed to be fixed through the fixing base 14, in this way, the first electrode connecting element 131 may be electrically connected to the first electrode 121, and the second electrode connecting element 132 may be electrically connected to the second electrode 122.

[0045] As shown in FIG. 5, the fixing base 14 may be sleeved on the end of the heating element 11 which is provided with the electrodes 12. The fixing base 14 includes a base 141 and an upper cover 142. The base 141 and the upper cover 142 are both sleeved on the end of the heating element 11. In some embodiments, the base 141 and the upper cover 142 are both sleeved on the first end 111 of the heating element 11, and each electrode connecting element 13 is sandwiched between the upper cover 142 and the base 141. During assembly, after the base 141 is sleeved on the first end 111 of the heating element 11, each electrode connecting element 13 is arranged on the outer side surface of the base 141, then the upper cover 142 is sleeved on the outer side of the heating element 11, the base 141, and each electrode connecting element 13. Each electrode connecting element 13 is sandwiched between the upper cover 142 and the base 141. Each electrode connecting element 13 is fixed by being sandwiched between the upper cover 142 and the base 141, the fixing mode is simple and stable. In some embodiments, the fixing base 14 may also fix each electrode connecting element 13 by other modes. For example, the fixing base 14 may be clamped or engaged with each electrode connecting element 13 to fix each electrode connecting element 13.

[0046] In some embodiments, as shown in FIG. 6, FIG. 6 is a schematic structural view of a base 141 according to some embodiments of the present disclosure. The base 141 includes a first annular sidewall 1411 and a mounting portion 1412. The mounting portion 1412 is arranged in the internal space of the first annular sidewall 1411 and forms an accommodating chamber in cooperation with the first annular sidewall 1411. The first end 111 of the heating element 11 is arranged in the accommodating chamber. The accommodating chamber may be an accommodating groove. The mounting portion 1412 defines a through hole 1413. The through hole 1413 is in communication with the receiving chamber 1131 of the heating element 11. In this way, after the heating element 11 is assembled with the base 141, the receiving chamber 1131 may also be in communication with the external air, and an air flow may enter the aerosol generation substrate in the receiving chamber 1131.

[0047] The upper cover 142 may be clamped or engaged with the base 141. As shown in FIGS. 6 and 7, FIG. 7 is a schematic structural view of an upper cover 142 according to some embodiments of the present disclosure. One or more protrusions 1414 are arranged on the outer surface of the first annular sidewall 1411 away from the second end 112 of the heating element 11. The one or more protrusions 1414 are configured to abut against the bottom surface of the upper cover 142. The one or more protrusions 1414 may include an annular protrusion or one or more curved protrusions 1414. In some embodiments, the one or more protrusions 1414 include two curved protrusions 1414. The outer edge of each curved protrusion 1414 defines a notch 1415. The upper cover 142 includes a second annular sidewall 1421, and one or more engaging portions 1422 are provided on the second annular sidewall 1421. Each of the one or more engaging portions 1422 is extended away from the second end 112 of the heating element 11 and is extended to the side of the bottom surface of the second annular sidewall 1421 away from the second end 112 of the heating element 11. In this way, when the bottom surface of the base 141 abuts against the one or more protrusions 1414, each engaging portion 1422 is clamped or engaged to a corresponding notch 1415. The engaging mode of the upper cover 142 and the base 141 is not limited to the engaging structure provided by these embodiments of the present disclosure.

[0048] As shown in FIGS. 6 and 8, FIG. 8 is a schematic structural view of a curved metal sheet according to some embodiments of the present disclosure. In some embodiments, each electrode connecting element 13 is a curved metal sheet, and the curved metal sheet may also abut against the one or more protrusions 1414 on the first annular sidewall 1411 to limit the position of the curved metal sheet. In some embodiments, each curved metal sheet has a body portion 133 and a protruding portion 134. The body portion 133 has a first side edge 1331 close to the second end 112 of the heating element 11 and a second side edge 1332 away from the second end 112 of the heating element 11. The protruding portion 134 is connected to the second side edge 1332 of the body portion 133. There may be a gap between two adjacent protrusions 1414 of the base 141. During assembly, the second side edge 1332 of the body portion 133 of the curved metal sheet abuts against the one or more protrusions 1414 of the base 141, and the protruding portion 134 of the curved metal sheet is clamped or engaged into the gap between the two protrusions 1414.

[0049] As shown in FIG. 5, a first portion 135 of each electrode connecting element 13 is exposed through the base 141 and abuts against a corresponding electrode 12 of the electrodes 12 on the heating element 11. In some embodiments, the first annular sidewall 1411 does not completely cover the electrodes 12 on the first end 111 of the heating element 11. Each electrode connecting element 13 is arranged on the outer side surface of the first annular sidewall 1411. A part of each electrode connecting element 13 is extended out of the first annular sidewall 1411 and is exposed, and the part of each electrode connecting element 13 extended out of the first annular sidewall 1411 is the first portion 135 of each electrode connecting element 13. The first portion 135 of each electrode connecting element 13 is connected to the corresponding electrode 12 on the first end 111 of the heat-

ing element 11. In some embodiments, as shown in FIG. 5, the first annular sidewall 1411 may define one or more first openings 1411a. Each of the one or more electrodes 12 on the first end 111 of the heating element 11 is exposed through a corresponding first opening 1411a of the one or more first openings 1411a. A part of each electrode connecting element 13 is exposed through a corresponding first opening 1411a of the one or more first openings 1411a, and the part of each electrode connecting element 13 exposed through the corresponding first opening 1411a is the first portion 135 of each electrode connecting element 13. The first portion 135 of each electrode connecting element 13 is connected to the corresponding electrode 12 on the first end 111 of the heating element 11 through the corresponding first opening 1411a. By the aforesaid modes, each electrode connecting element 13 may be electrically connected to the corresponding electrode 12 while each electrode connecting element 13 is fixed by the base 141.

[0050] In some embodiments, as shown in FIG. 8, each curved metal sheet may also include one or more first abutting portions 137. Each of the one or more first abutting portions 137 is connected to the first side edge 1331 of the body portion 133. An end of each first abutting portion 137 away from the body portion 133 is bent towards the heating element 11 to form an elastic contactor. The first portion 135 of each electrode connecting element 13 is the bending portion of each first abutting portion 137. The elastic contactor is exposed through a corresponding first opening 1411a and abuts against the corresponding electrode 12. When each first abutting portion 137 abuts against the corresponding electrode 12, an elastic force may be generated, in this way, each first abutting portion 137 may be well contacted with the corresponding electrode 12. The one or more first abutting portions 137 may include a plurality of first abutting portions. For example, in some embodiments, the one or more first abutting portions 137 may include two first abutting portions. The more the number of the one or more first abutting portions 137 is, the more stable the electrical connection between the one or more first abutting portions 137 and the corresponding electrode 12 is.

[0051] In some embodiments, the curved metal sheet may also include a plurality of second extending portions 138. Each second extending portion 138 is connected to the first side edge 1331 of the body portion 133. Each second extending portion 138 is arranged on the first annular sidewall 1411. The plurality of second extending portions 138 and the plurality of first abutting portions 137 are alternately arranged on the first side edge 1331. In some embodiments, the plurality of second extending portions 138 include two second extending portions 138, and the two second extending portions 138 and two first abutting portions 137 are alternately arranged one by one. The arrangement of the second extending portions 138 helps the structure of the curved metal sheet to be more stable.

[0052] As shown in FIG. 9, FIG. 9 is a schematic structural view of mounting an electrode connecting element 13 shown in FIG. 5 on a base 141. A second portion 136 of each electrode connecting element 13 is exposed through the upper base and is configured to be connected to the external power supply. As shown in FIG. 9, the second annular sidewall 1421 of the upper cover 142 defines one or more second openings 1421a. Another part of each electrode connecting element 13 is exposed through a corresponding second opening 1421a of the one or more second openings 1421a. The exposed another part is the second portion 136 of each electrode connecting element 13. In some embodiments, as shown in FIGS. 8 and 9, the protruding portion 134 and a part of the body portion 133 are the second portion 136 of each electrode connecting element 13 and are exposed through the corresponding second opening 1421a. In this way, the external power supply may be electrically connected to the protruding portion 134 and the part of the body portion 133 through the corresponding second opening 1421a, and thereby being electrically connected to the corresponding electrode 12 on the heating element 11. In some embodiments, a part of each electrode connecting element 13 may be extended out of the second annular sidewall 1421, and the part of each electrode connecting element 13 extended out of the second annular sidewall 1421 is the second portion 136 of each electrode connecting element 13.

[0053] As shown in FIGS. 9 and 10, FIG. 10 is another schematic structural view of the heating assembly 10 shown in FIG. 1 viewed from another angle. In some embodiments, one end of the base 141 close to the second end 112 of the heating element 11 and one end of the upper cover 142 close to the second end 112 of the heating element 11 are sleeved on the first end 111 of the heating element 11, and the other end of the base 141 away from the second end 112 of the heating element 11 and the other end of the upper cover 142 away from the second end 112 of the heating element 11 are suspended. The second portion 136 of each electrode connecting element 13 is arranged on the suspended portion of the first annular sidewall 1411 and is exposed through the corresponding second opening 1421a. By arranging the second portion 136 of each electrode connecting element 13 on the first annular sidewall 1411, when an external leading wire or an external elastic sheet is electrically connected to the second portion 136 of each electrode connecting element 13, force is not directly acted on the heating element 11 and is mainly acted on the first annular sidewall 1411 of the base 141. In this way, it may be avoided that force is directly acted on the heating element 11. When the force is directly acted on the heating element 11, the heating film 114 of the heating element 11 may be damaged. In some embodiments, the second portion 136 of each electrode connecting element 13 is arranged on the suspended portion of the first annular sidewall 1411, in this way, the force act on the heating element 11 may be further reduced, so as to avoid the heating element 11 from being damaged.

[0054] As shown in FIG. 11, FIG. 11 is a schematic structural view of an aerosol generation apparatus and an aerosol generation substrate according to some embodiments of the present disclosure. Some embodiments of the present disclosure provide an aerosol generation apparatus. The aerosol generation apparatus includes a housing 20, a heating assembly 10 (which is not shown in FIG. 11), and a power supply assembly 30 (which is not shown in FIG. 11). The heating assembly 10 and the power supply assembly 30 are both arranged in the housing 20. The top wall of the housing 20 defines a mounting hole 21. The mounting hole 21 faces a receiving chamber 1131 of the heating element 11 of the heating assembly 10, in this way, the aerosol generation substrate may be inserted or retreated out of the heating element 11 through the mounting hole 21.

[0055] The heating assembly 10 may be the heating assembly 10 involved in any of the aforesaid embodiments. The specific structure and function of the heating assembly 10 may be referred to the relevant description of the heating assembly 10 in the aforesaid embodiments, and the same or similar technical effects may be achieved, which will not be repeated herein.

[0056] In the aerosol generation apparatus provided by some embodiments of the present disclosure, a heating assembly 10 is provided. In the heating assembly 10, the electrode connecting element 13 is in the shape of a non-annular sheet. When being assembled, the electrode connecting element 13 may be electrically connected to the electrode 12 on the heating element 11 by the way of attaching to the heating element 11. The electrode connecting element 13 is not required to be sleeved on the heating element 11, so as to avoid the friction between the electrode connecting element 13 and the heating element 11 during assembly. In this way, the heating film 114 or heating coating on the surface of the heating element 11 may be avoided from being scratched.

[0057] As shown in FIG. 12, FIG. 12 is a schematic structural view of some assemblies of an aerosol generation apparatus according to some embodiments of the present disclosure. The power supply assembly 30 includes a bracket 31, a control circuit board (which is not shown in drawings), a battery 32, and an air intake pipe 33. The heating assembly 10, the control circuit board, and the battery 32 are all fixed in the bracket 31.

[0058] The control circuit board is electrically connected to the heating assembly 10 and the battery 32. The control circuit board is configured to control the battery 32 to power the heating assembly 10 and control the operation of the heating assembly 10 after receiving an enable signal. The control circuit board may also be configured to control the heating power, heating duration, and so on, of the heating assembly 10.

[0059] One end of the air intake pipe 33 is connected to the first end 111 of the heating element 11 and is in communication with the receiving chamber 1131 of the heating element 11. The other end of the air intake pipe 33 is in communication with external air. In this way, when the user inhales from the second end 112 of the heating element 11, the external air may enter the aerosol generation substrate in the receiving chamber 1131 of the heating element 11 and carry the atomized aerosols to flow out of the aerosol generation apparatus for the user.

[0060] As shown in FIGS. 12 to 14, FIG. 13 is a schematic structural view of a conductive element according to some embodiments of the present disclosure, and FIG. 14 is a schematic structural view of a conductive element 34 and a heating assembly 10 according to some embodiments of the present disclosure. In some embodiments, the power supply assembly 30 may also include one or more conductive elements 34. Each of the one or more conductive elements 34 is fixed on the bracket 31. Each of the one or more conductive elements 34 is electrically connected to the control circuit board, and abuts against a corresponding electrode connecting element 13 of the one or more electrode connecting elements 13, in this way, the control circuit board may be electrically connected to the one or more electrode connecting elements 13 through the one or more conductive elements 34.

[0061] Each of the one or more conductive elements 34 includes a main portion 341, a second abutting portion 342, and a fixing portion 343. The main portion 341 is fixed on the bracket 31. In some embodiments, the main portion 341 may be fixed on the bracket 31 through a screw. In some embodiments, the main portion 341 may be fixed on the bracket 31 by the mode of adhering, engaging, and so on. In some embodiments, each conductive element 34 is a metal sheet, and the main portion 341, the second abutting portion 342, and the fixing portion 343 are integrally formed.

[0062] The second abutting portion 342 and the fixing portion 343 are connected to the main portion 341 respectively. The fixing portion 343 may be configured to be welded with an external leading wire, and is electrically connected to the control circuit board through the external leading wire. The second abutting portion 342 abuts against the exposed second portion 136 of the corresponding electrode connecting element 13 of the heating assembly 10, so as to realize electric connection between each conductive element 34 and the corresponding electrode connecting element 13. The one or more conductive elements 34 include two conductive elements 34. One of the two conductive elements 34 abuts against the first electrode connecting element 131 and is connected to a positive leading wire, and the other of the two conductive elements 34 abuts against the second electrode connecting element 132 and is connected to a negative leading wire.

[0063] In some embodiments, the second abutting portion 342 is bent to the corresponding electrode connecting element 13, the convex face of the second abutting portion 342 faces the corresponding electrode connecting element 13, and the second abutting portion 342 is elastic. The convex surface of the second abutting portion 342 abuts against the second portion 136 of the cor-

responding electrode connecting element 13. By bending the second abutting portion 342, an elastic force may be generated when the second abutting portion 342 abuts against the corresponding electrode 12, in this way, the second abutting portion 342 may be well contacted with the corresponding electrode 12.

[0064] By arranging the one or more conductive elements 34 in the aerosol generation apparatus, the external leading wire may be welded to the one or more conductive elements 34 during assembly instead of being directly welded to the one or more electrode connecting elements 13, in this way, the force act on the heating element 11 may be further reduced during assembly, thereby preventing the heating film 114 on the heating element 11 from being damaged.

[0065] The foregoing is merely some preferred embodiments of the present disclosure and is not intended to limit the present disclosure. For those skilled in the art, the present disclosure may have various modifications and changes. Any modifications, equivalents, improvements, etc. that are within the spirit and principles of present disclosure are intended to be included within the scope of present disclosure.

Claims

1. A heating assembly, comprising:

a heating element, configured to receive and heat an aerosol generation substrate in response to being powered on;
one or more electrodes, arranged on the heating element and electrically connected to the heating element; and
one or more electrode connecting elements, electrically connected to the one or more electrodes, wherein each of the one or more electrode connecting elements is sheet-shaped and comprises a first end portion and a second end portion spaced apart from each other in a bending direction of each of the one or more electrode connecting elements.

2. The heating assembly according to claim 1, wherein the heating element comprises a first end and a second end opposite to each other, the one or more electrodes comprise two electrodes, the two electrodes comprise a first electrode and a second electrode spaced apart from each other, and a connecting portion of the first electrode and a connecting portion of the second electrode are both arranged on the first end of the heating element, the one or more electrode connecting elements comprise two electrode connecting elements, the two electrode connecting elements comprise a first electrode connecting element and a second electrode connecting element spaced apart from each other, the first electrode connecting element is arranged on the first end of the heating element and electrically connected to the connecting portion of the first electrode, and the second electrode connecting element is arranged on the first end of the heating element and electrically connected to the connecting portion of the second electrode.

3. The heating assembly according to claim 1, further comprising a fixing base, wherein the fixing base is arranged on an end of the heating element and fixes each of the one or more electrode connecting elements.

4. The heating assembly according to claim 3, wherein the fixing base comprises a base and an upper cover, the fixing base is sleeved on an end of the heating element with the one or more electrodes, each of the one or more electrode connecting elements is sandwiched between the upper cover and the base, a first portion of each of the one or more electrode connecting elements is exposed and abuts against a corresponding electrode of the one or more electrodes, and a second portion of each of the one or more electrode connecting elements is exposed and configured to be connected to an external power supply.

5. The heating assembly according to claim 4, wherein the base comprises a first annular sidewall, the first annular sidewall is sleeved on the end of the heating element with the one or more electrodes, the first annular sidewall defines one or more first openings configured to expose each of the one or more electrodes, the first portion of each of the one or more electrode connecting elements is exposed through a corresponding first opening of the one or more first openings and abuts against the corresponding electrode, the upper cover is sleeved on the outside of the base, and at least part of the upper cover cooperates with the base to sandwich each of the one or more electrode connecting elements.

6. The heating assembly according to claim 5, wherein one end of the first annular sidewall is sleeved on the end of the heating element with the one or more electrodes, the other end of the first annular sidewall is suspended, and the second portion of each of the one or more electrode connecting elements is arranged on a suspended portion of the first annular sidewall.

7. The heating assembly according to claim 6, wherein the heating element is cylinder-shaped, a heating film is arranged on the surface of the heating element, each of the one or more electrodes is arranged on the outer surface of the heating element and electrically connected to the heating film, and each of the

one or more electrode connecting elements is a curved metal sheet.

8. The heating assembly according to claim 7, wherein the radian of the curved metal sheet is less than 180 degrees.

9. The heating assembly according to claim 8, wherein the curved metal sheet comprises a body portion and one or more first abutting portions connected to a first side edge of the body portion, an end of each of the one or more first abutting portions away from the body portion is bent towards the heating element to form an elastic contactor, and the elastic contactor is exposed through the corresponding first opening and abuts against the corresponding electrode.

10. The heating assembly according to claim 9, wherein the curved metal sheet further comprises a plurality of first extending portions connected to the first side edge of the body portion, the one or more first abutting portions comprise a plurality of first abutting portions, and the plurality of first extending portions and the plurality of first abutting portions are alternately arranged on the first side edge one by one.

11. The heating assembly according to claim 9, wherein the curved metal sheet further comprises a protruding portion connected to a second side edge of the body portion opposite to the first side edge of the body portion, the upper cover defines a second opening, and the protruding portion is exposed through the second opening.

12. An aerosol generation apparatus, comprising:

a heating assembly, configured to heat an aerosol generation substrate after being powered on, wherein the heating assembly is the heating assembly according to any one of claims 1-11; and
a power supply assembly, electrically connected to the heating assembly, and configured to power the heating assembly.

13. The aerosol generation apparatus according to claim 12, wherein the power supply assembly comprises:

a bracket;
a control circuit board, arranged in the bracket;
one or more conductive elements, fixed in the bracket, wherein each of the one or more conductive elements is electrically connected to the control circuit board; and
wherein the heating assembly is arranged in the bracket, and each of the one or more conductive elements abuts against a corresponding electrode connecting element of the one or more electrode connecting elements.

14. The aerosol generation apparatus according to claim 13, wherein the heating assembly is the heating assembly according to any one of claims 5-11; and
wherein each of the one or more conductive elements comprises a main portion and a second abutting portion connected to each other, the main portion is fixedly connected to the bracket, and the second abutting portion abuts against the second portion of the corresponding electrode connecting element.

15. The aerosol generation apparatus according to claim 14, wherein the one or more conductive elements comprise two conductive elements spaced apart from each other, the second abutting portion of each of the two conductive elements is bent towards the corresponding electrode connecting element, a convex surface of the second abutting portion of each of the two conductive elements faces the corresponding electrode connecting element, and the second abutting portion of each of the two conductive elements is elastic.

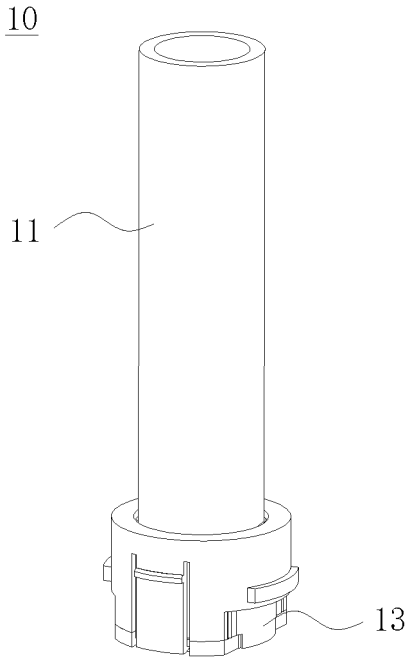


FIG. 1

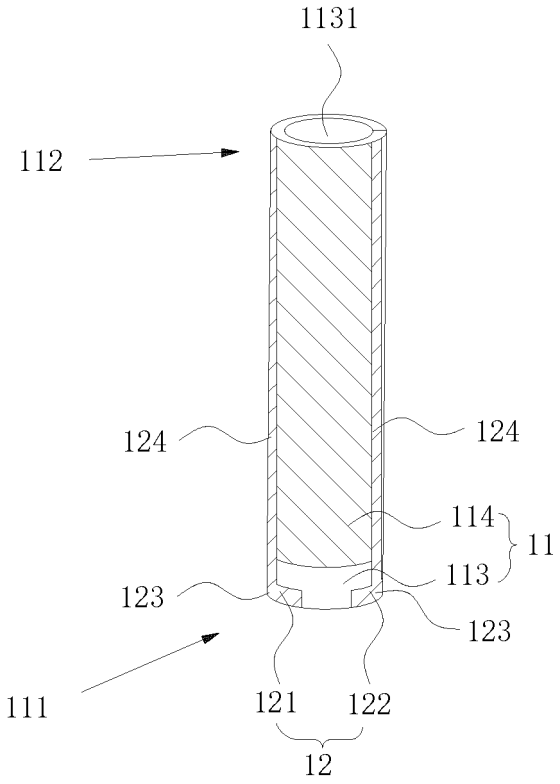


FIG. 2

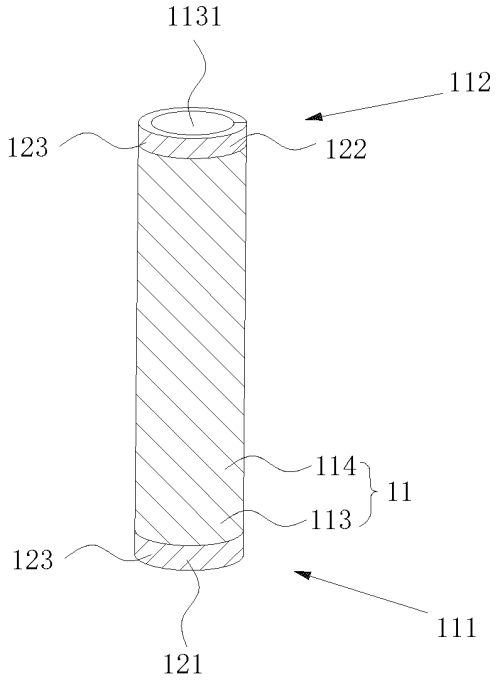


FIG. 3

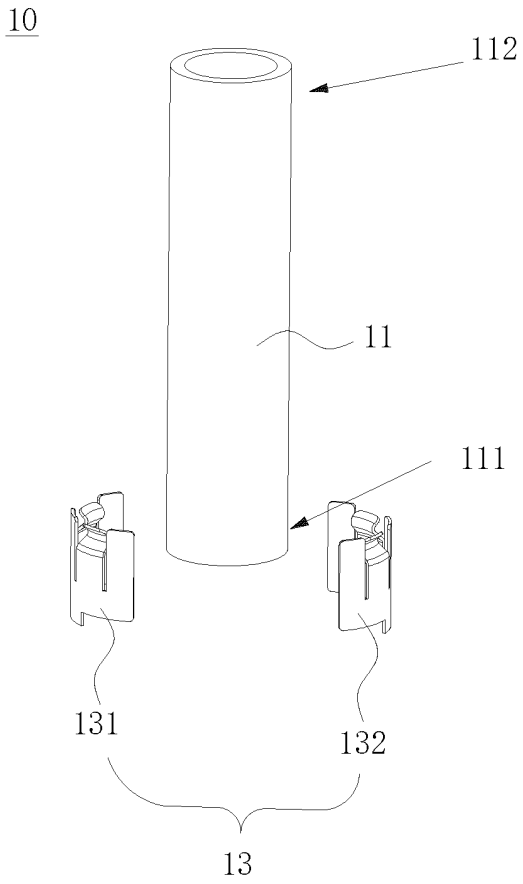


FIG. 4

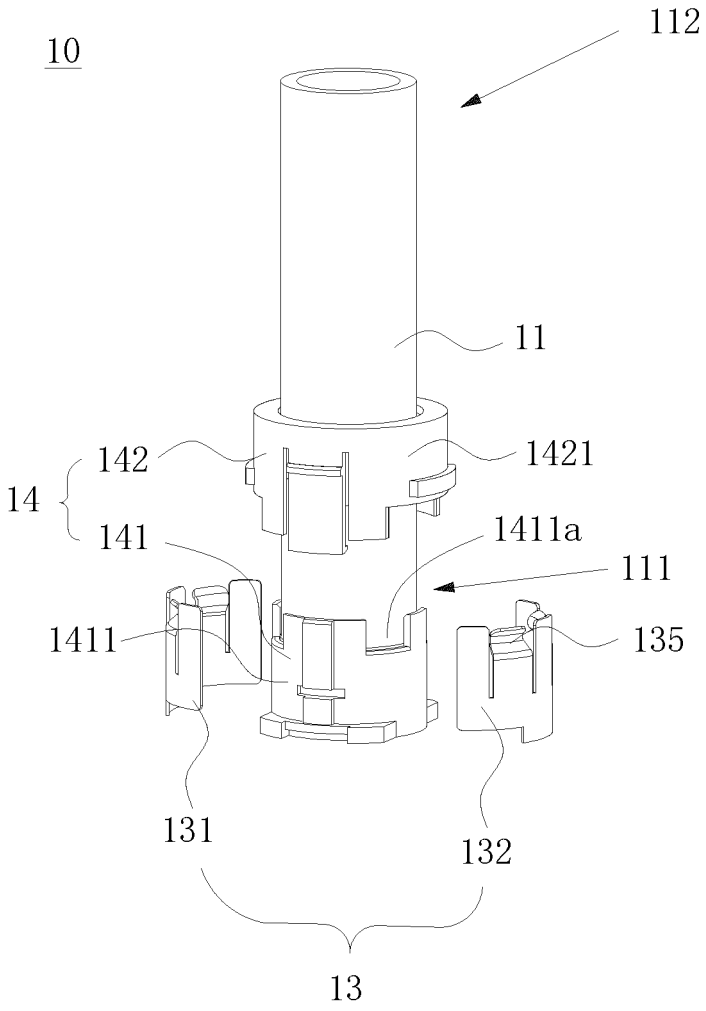

10
112
11
142
14
141
1421
1411a
111
1411
135
131
132
13

FIG. 5

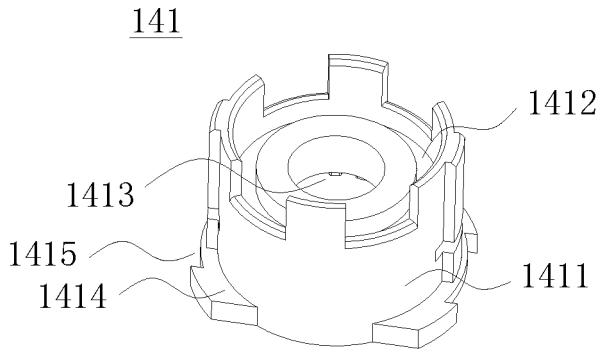

141
1412
1413
1415
1414
1411

FIG. 6

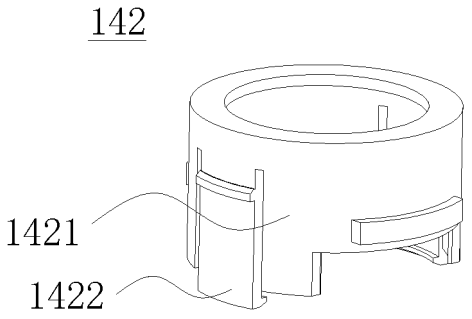


FIG. 7

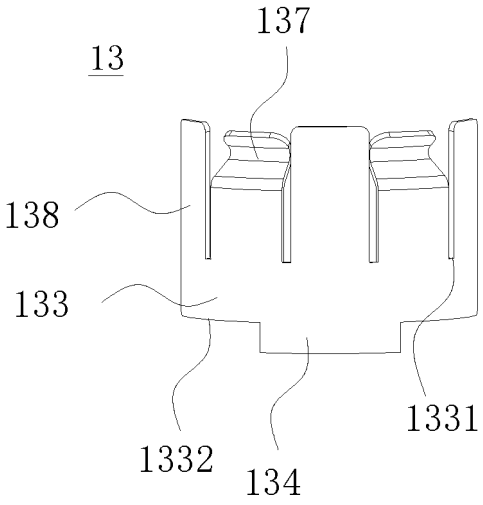
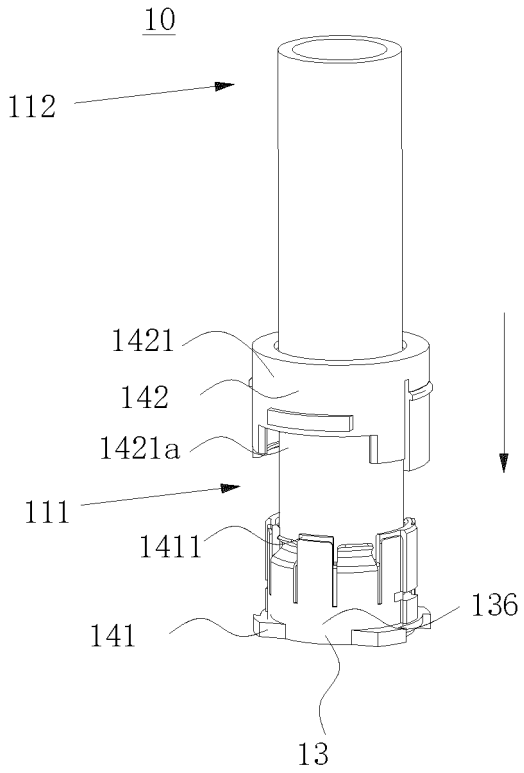


FIG. 8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136
141
13

FIG. 9

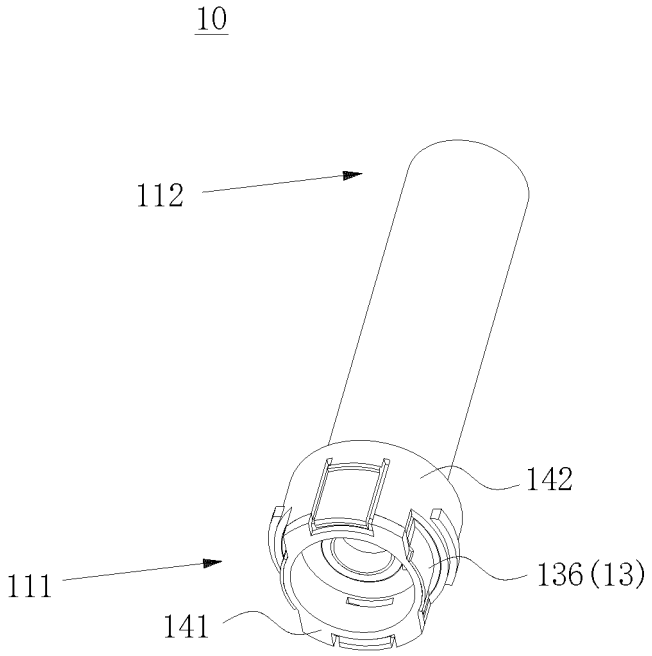
10
112
142
111
136(13)
141

FIG. 10

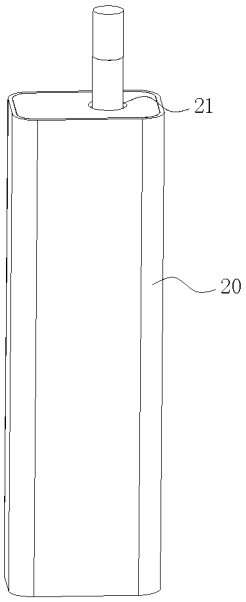

FIG. 11

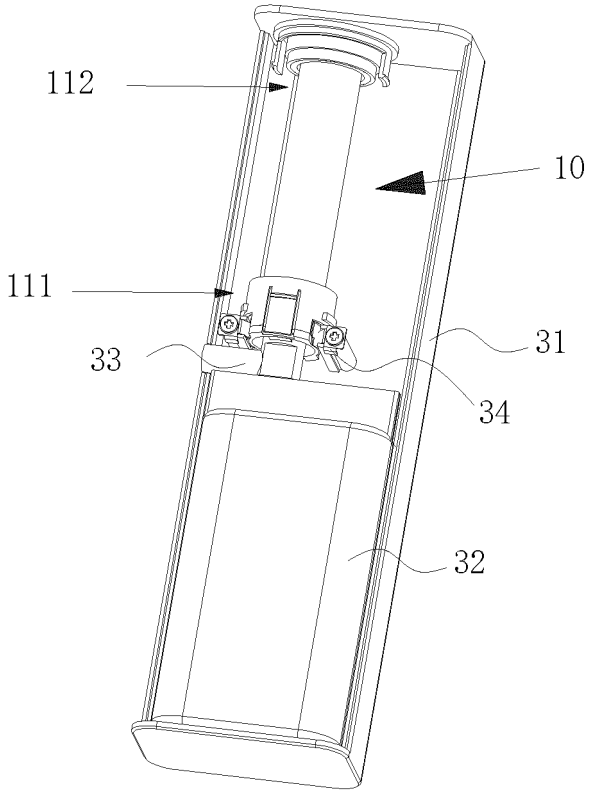

FIG. 12

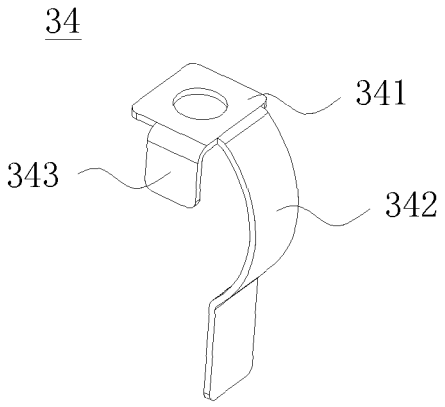

FIG. 13

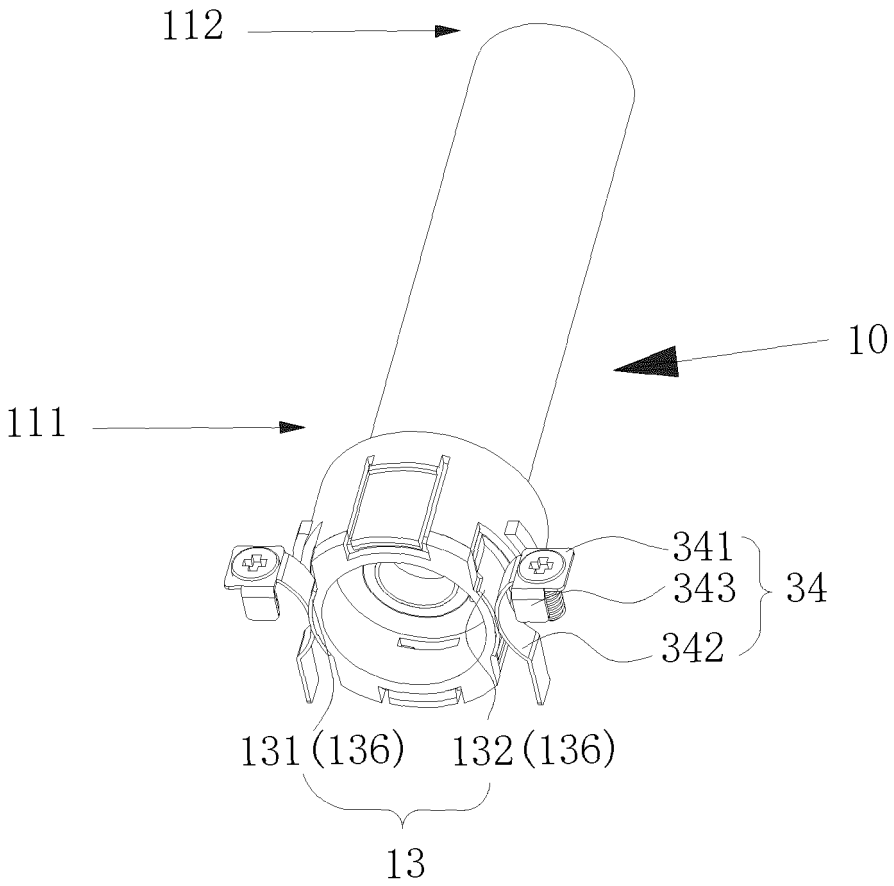

FIG. 14

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2022/128024

A. CLASSIFICATION OF SUBJECT MATTER

A24F 40/46(2020.01)i; A24F 40/40(2020.01)i; A24F 40/50(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)

A24F40,A61M11

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, ENTXT, WPABS, DWPI: 加热, 气溶胶, 烟, 电极, 连接结构, 连接件, heat+, aerosol, smoke?, electrode?, connecting structure?, connector?, connect+

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 216651324 U (SHENZHEN MAISHI TECHNOLOGY CO., LTD.) 03 June 2022 (2022-06-03) claims 1-15, and description, paragraphs 1-86, and figures 1-14	1-15
X	CN 213344347 U (SHENZHEN FIRST UNION TECHNOLOGY CO., LTD.) 04 June 2021 (2021-06-04) claims 1-15, and description, paragraphs 6-81, and figures 2-13	1-15
X	CN 213848764 U (SHENZHEN FIRST UNION TECHNOLOGY CO., LTD.) 03 August 2021 (2021-08-03) description, paragraphs 2-73, and figures 1-10	1-15
A	CN 113080520 A (SHENZHEN FIRST UNION TECHNOLOGY CO., LTD.) 09 July 2021 (2021-07-09) entire document	1-15
A	US 2021267277 A1 (CHANGZHOU PATENT ELECTRONIC TECHNOLOGY CO., LTD.) 02 September 2021 (2021-09-02) entire document	1-15
A	JP 2012200299 A (RIN KAGEN) 22 October 2012 (2012-10-22) entire document	1-15

☐ 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
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"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
	28 January 2023
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/CN2022/128024

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN 216651324 U	03 June 2022	None	
CN 213344347 U	04 June 2021	None	
CN 213848764 U	03 August 2021	None	
CN 113080520 A	09 July 2021	None	
US 2021267277 A1	02 September 2021	CN 209346094 U	06 September 2019
		EP 3881695 A1	22 September 2021
		WO 2020098513 A1	22 May 2020
JP 2012200299 A	22 October 2012	None	

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 202122765750 **[0001]**