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

(72) Inventors:
- **CHEN, Haichao**
  **Shenzhen, Guangdong 518105 (CN)**
- **GUO, Yubo**
  **Shenzhen, Guangdong 518105 (CN)**
- **CHEN, Junliang**
  **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 FORMATION DEVICE

(57) Disclosed in the present application are a heating assembly and an aerosol formation device. The heating assembly comprises a heating unit and at least two electromagnetic elements, wherein the heating unit is configured to generate heat by means of induction of a magnetic field and heat an aerosol generation substrate; the heating unit comprises at least two heating sub-units and a connecting portion, which is connected between the adjacent heating sub-units; each heating subunit has an accommodating cavity for accommodating a portion of the aerosol generation substrate; and the at least two electromagnetic elements are arranged corresponding to the at least two heating sub-units, and are configured to provide the magnetic field. By means of the above arrangement, control for the temperature of the heating unit portion by portion is achieved, which is further conducive to improving the usage experience of a user.

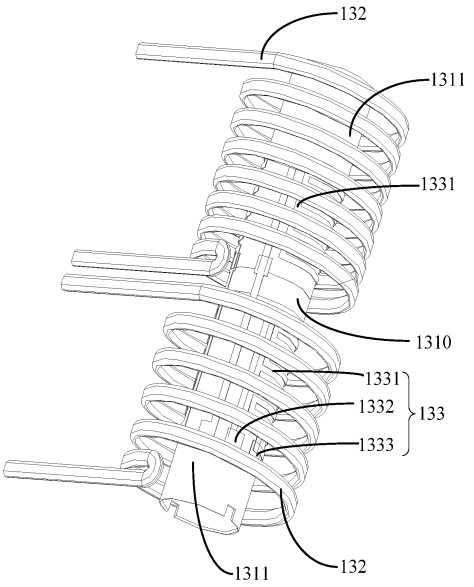



FIG. 4

EP 4 445 778 A1

## Description

### CROSS REFERENCE TO RELATED APPLICATIONS

**[0001]** The present application claims the priority of Chinese patent application No. 202111512133.3, filed on December 7, 2021, and contents of which are incorporated herein by its entireties.

### TECHNICAL FIELD

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

### BACKGROUND

**[0003]** A heat-not-burning aerosol-generating device is a type of atomizing device that heats an aerosol-generating substrate (such as products of treated plant leaves) without burning the aerosol-generating substrate. In this type of the aerosol-generating device, the aerosol-generating substrate is heated at a high temperature at which the aerosol-generating substrate is capable of generating aerosols but cannot be burned, such that the aerosol-generating substrate generates aerosols for a user.

**[0004]** In the heat-not-burning aerosol-generating device, a heater is a key element that determines quality of the generated aerosol. In the art, the heater generates heat electromagnetically, and when one portion of the aerosol-generating substrate is heated, a temperature of another portion increases rapidly due to heat conduction, resulting in a control system losing control of the temperature of the another portion.

### SUMMARY OF THE DISCLOSURE

**[0005]** The present disclosure provides a heating assembly and an aerosol-generating device, to solve the technical problem that the control system loses control of a temperature of a portion due to the temperature of the portion increasing rapidly based on heat conduction when another portion is heated.

**[0006]** In a first aspect, a heating assembly is provided and includes: a heater, configured to generate, by sensing a magnetic field, heat and heat an aerosol-generating substrate; wherein, the heater comprises at least two sub-heaters and a connecting portion that connects two adjacent sub-heaters of the at least two sub-heaters; each of the at least two sub-heaters has a receiving to receive a portion of the aerosol-generating substrate; and at least two electromagnetic members, arranged in correspondence with the at least two sub-heaters and configured to provide the magnetic field.

**[0007]** In some embodiments, the heater comprises two sub-heaters and the connecting portion that connects the two sub-heaters; the connecting portion and the two sub-heaters are configured as a one-piece and integral structure; the heater further comprises a partition structure defined in the connecting portion; the connecting portion is annular, and a side wall of the connecting portion defines openings to serve as the partition structure.

**[0008]** In some embodiments, the number of the openings is more than one, and the more than one openings are spaced apart from each other and are located along the circumference of the connecting portion.

**[0009]** In some embodiments, the heating assembly further comprises at least two temperature measuring traces. The at least two the temperature measuring traces are arranged in correspondence with the at least two sub-heaters; each of the at least two temperature measuring traces is configured to measure a temperature of a corresponding one of the at least two sub-heaters; and the at least two temperature measuring traces are arranged independently from each other.

**[0010]** In some embodiments, the temperature measuring trace is disposed on the outer side of the corresponding sub-heater; an insulating layer is disposed between the sub-heater and the temperature measuring trace; each temperature measuring trace comprises a temperature measuring trace layer, a positive electrode, and a negative electrode, and the positive electrode and the negative electrode are connected to the temperature measuring trace layer.

**[0011]** In some embodiments, the heater comprises a first sub-heater and a second sub-heater, the heating assembly comprises a first temperature measurement line arranged correspondingly to the first sub-heater and a second temperature measurement line arranged correspondingly to the second sub-heater, the first temperature measurement line comprises a first temperature measurement line layer, a first positive electrode, and a first negative electrode; and the second temperature measurement line comprises a second temperature measurement line layer, a second positive electrode, and a second negative electrode.

**[0012]** The first positive electrode and the first negative electrode are disposed at an end of the first sub-heater away from the second sub-heater; the second positive electrode and the second negative electrode are disposed at an end of the second sub-heater away from the first sub-heater.

**[0013]** Alternatively, the first positive electrode, the first negative electrode, the second positive electrode, and the second negative electrode are all disposed at an end of the second sub-heater away from the first sub-heater.

**[0014]** In some embodiments, the first positive electrode, the first negative electrode, the second positive electrode, and the second negative electrode are arranged independently from each other.

**[0015]** Alternatively, the first positive electrode and the second positive electrode share a common electrode, and the first negative electrode and the second negative electrode are provided independently from each other.

**[0016]** Alternatively, the first positive electrode and the

second positive electrode are provided independently from each other, and the first negative electrode and the second negative electrode share a common electrode.

**[0017]** In some embodiments, the first positive electrode, the first negative electrode, the second positive electrode, and the second negative electrode are all disposed at the end of the second sub-heater away from the first sub-heater.

**[0018]** The temperature measuring trace further comprises a lead, a first end of the lead of the first temperature measuring trace is connected to the first temperature measuring trace layer, a second end of the lead of the first temperature measuring trace passes through a region where the connecting portion and the second temperature measuring trace are located and is further connected to the first positive electrode or the first negative electrode of the first temperature measuring trace.

**[0019]** In some embodiments, the heater comprises two sub-heaters and the connecting portion that connects the two sub-heaters; and thermal conductivity of the connecting portion is lower than thermal conductivity of the sub-heater.

**[0020]** In some embodiments, the two sub-heaters are two hollow cylinders; the two sub-heaters are arranged coaxially with each other and are spaced apart from each other; the connecting portion is annular; the annular connecting portion is in cooperation with the two hollow cylindrical sub-heaters; each of two ends of the connecting portion is connected to a corresponding one of the two sub-heaters.

**[0021]** In a second aspect, an aerosol-generating device is provided and includes: the heating assembly according to the fist aspect and a power supply assembly. The power supply assembly is electrically connected to the electromagnetic members and is configured to supply power to the electromagnetic members.

**[0022]** According to the present disclosure, the heating assembly includes a heater and at least two electromagnetic members. The heater is configured to generate, by sensing a magnetic field, heat to heat the aerosol-generating substrate. The heater includes at least two sub-heaters and a connecting portion that connects two adjacent sub-heaters. Each sub-heater has a receiving cavity to receive a portion of the aerosol-generating substrate. The at least two electromagnetic members are arranged in one-to-one correspondence with the at least two sub-heaters and are configured to provide a magnetic field. In this way, the temperature of each portion of the heater is controlled respectively. Therefore, when the heater heats one portion of the aerosol-generating substrate, and the temperature of another portion may not increase due to heat conduction, such that the controller may not lose control of the temperature of the another portion, and usage experience may be improved.

## BRIEF DESCRIPTION OF THE DRAWINGS

**[0023]** In order to more clearly illustrate technical solutions in embodiments of the present disclosure, accompanying drawings for describing the embodiments of the present disclosure will be introduced briefly. Obviously, the accompanying drawings show only some of the embodiments of the present disclosure. Any ordinary skilled person in the art may obtain other drawings according to these drawings without making any creative work.

FIG. 1 is a structural schematic view of an aerosol-generating device according to an embodiment of the present disclosure.

FIG. 2 is a structural schematic view of an aerosol-generating substrate and the aerosol-generating device being assembled with each other according to an embodiment of the present disclosure.

FIG. 3 is a cross-sectional view of the aerosol-generating device, taken along a direction A-A, according to an embodiment of the present disclosure.

FIG. 4 is a structural schematic view of a portion of a heating assembly according to an embodiment of the present disclosure.

FIG. 5 is a structural schematic view of a portion of a heater of the heating assembly shown in FIG. 4.

FIG. 6 is a structural schematic view of the heater of the heating assembly shown in FIG. 4.

FIG. 7 is a structural schematic view of the heater of the heating assembly according to another embodiment of the present disclosure.

FIG. 8 is a structural schematic view of the heater in the heating assembly according to still another embodiment of the present disclosure.

## DETAILED DESCRIPTION

**[0024]** Technical solutions in the embodiments of the present disclosure will be described clearly and completely in the following by referring to the accompanying drawings in the embodiments of the present disclosure. Obviously, the described embodiments are only a part of, not all of, the embodiments of the present disclosure. All other embodiments, which are obtained by any ordinary skilled person in the art based on the embodiments in the present disclosure without making creative work, shall fall within the scope of the present disclosure.

**[0025]** In order to provide a thorough understanding of the present disclosure, the following description provides specific details, such as particular system structures, interfaces, and techniques, for purposes of illustration and not for limitation.

**[0026]** Terms "first", "second", and "third" herein are used for descriptive purposes only and shall not be interpreted as indicating or implying relative importance or implicitly specifying the number of technical features. Therefore, a feature defined as "first", "second", "third" may expressly 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, and so on, unless otherwise expressly and specifically limited. All

directional indications (such as up, down, left, right, front, rear .....) in the embodiments of the present disclosure are used only to explain relative positional relationships and movements between components in a particular attitude (the attitude shown in the drawing). The directional indications may be changed accordingly if the particular attitude is changed. Terms "include" and "have", and any variations thereof, in the embodiments of the present disclosure are intended to cover non-exclusive inclusion. For example, a process, a method, a system, a product or a device including a series of steps or units is not limited to the listed steps or units, but may further include steps or units that are not listed, or include steps or components that are inherently included in the process, the method, the system, the product or the device.

**[0027]** Reference to "embodiments" herein implies that particular features, structures, or properties described in embodiments may be included in at least one embodiment of the present disclosure. The presence of the term at various sections in the specification does not necessarily refer to a same embodiment, nor independent or alternative embodiments that are mutually exclusive of other embodiments. Any ordinary skilled person in the art shall understand that, both explicitly and implicitly, the embodiments described herein may be combined with other embodiments.

**[0028]** The present disclosure is described in detail below by referring to the accompanying drawings and embodiments.

**[0029]** As shown in FIG. 1 and FIG. 2, FIG. 1 is a structural schematic view of an aerosol-generating device according to an embodiment of the present disclosure; FIG. 2 is a structural schematic view of an aerosol-generating substrate and the aerosol-generating device being assembled with each other according to an embodiment of the present disclosure; and FIG. 3 is a cross-sectional view of the aerosol-generating device, taken along a direction A-A, according to an embodiment of the present disclosure.

**[0030]** The aerosol-generating device is configured to heat and bake the aerosol-generating substrate 100 and generate aerosols to be inhaled by a user. The aerosol-generating device has a receiving cavity 10, and the receiving cavity 10 is configured to receive the aerosol-generating substrate 100. The aerosol-generating substrate 100 is detachably connected to the receiving cavity 10 of the aerosol-generating device. The user may replace the aerosol-generating substrate 100 according to demands.

**[0031]** Specifically, the aerosol-generating device includes a housing 11, a heating switch 12, a heating assembly 13, and a power supply assembly 14.

**[0032]** In the present embodiment, the housing 11 is cylindrical. In other embodiments, the housing 11 may be in other shapes. The housing 11 may be made of one material or may be made of various materials, which may be determined based on demands. For example, the housing 11 includes a plastic outer layer and a metal inner layer. Only the plastic outer layer can be touched by the user while in use. Heat generated when the aerosol-generating device is operating is evenly distributed in the metal inner layer based on fast thermal conductivity of the metal. In this way, the plastic outer layer, which is contacted by the user, is prevented from being overheated to burn the user's hand, and the plastic outer layer is further prevented from softening.

**[0033]** The housing 11 has a mounting cavity 110, and the heating assembly 13 and the power supply assembly 14 are received in the mounting cavity 110. The heating assembly 13 may be fixedly arranged in the mounting cavity 110 (i.e., after the aerosol-generating device is released from the factory, the heating assembly 13 cannot be removed out of the device). Alternatively, the heating assembly 13 may be detachably arranged in the mounting cavity 110 (i.e., the heating assembly 13 is a replaceable structure after the aerosol-generating device is released from the factory). Connection between the heating assembly 13 and the mounting cavity 110 is determined based on demands. The power supply assembly 14 includes a battery (not shown in the drawing), an airflow sensor (not shown in the drawing), and a controller (not shown in the drawing), and so on. The battery is configured to supply power to the heating assembly 13. The airflow sensor is configured to detect a change in an airflow in the aerosol-generating device. The controller controls operation of the heating assembly 13 based on the change in the airflow detected by the airflow sensor. The heating assembly 13 has the receiving cavity 10. When the aerosol-generating substrate 100 is received in the receiving cavity 10, the power supply assembly 14 detects a change in the airflow and controls the heating assembly 13 to start operating to atomize the aerosol-generating substrate 100 to generate aerosols. The heating switch 12 is disposed on an exterior surface of the housing 11 and is electrically connected to a controller of the power supply assembly 14 to control the aerosol-generating device to be started and to be shut down.

**[0034]** The heating assembly 13 includes a heater 131 and at least two electromagnetic members 132. The heater 131 is configured to generate, by sensing a magnetic field, heat to heat the aerosol-generating substrate. The electromagnetic members 132 are configured to provide the magnetic field. The electromagnetic members 132 are electrically connected to the power supply assembly 14. The power supply assembly 14 is configured to supply power to the electromagnetic members 132 to enable the heater 131 to generate heat to bake the aerosol-generating substrate 100 to generate the aerosols. It is understood that the heater 13 further includes a fixation bracket (not shown in the drawing). The fixation bracket is configured to fix the heater 131 and the at least two electromagnetic members 132. A specific fixing method may be determined according to demands.

**[0035]** The heater 131 includes at least two sub-heaters 1311 and a connecting portion 1310 that connects two adjacent sub-generators of the at least two sub-heat-

ers 1311. Each sub-heater 1311 has a receiving cavity 1311a. The receiving cavity 1311a is configured to receive one portion of the aerosol-generating substrate 100. That is, at least two receiving cavities 1311a are communicated with each other to cooperatively form the receiving cavity 10.

**[0036]** It is understood that, in the art, the heater of the heating assembly is a one-piece tubular structure. When one portion of the heater generates heat due to the magnetic field, a temperature of another portion of the heater may be increased due to heat conduction, such that the controller may lose control of the temperature of the another portion of the heater, and therefore, an atomization effect may not be controlled optimally. The one-piece tubular heater in the art may not be easily controlled portion by portion, has high energy consumption, and may cause a temperature of the outer housing of the device to be excessively high. Compared to the heating assembly in the art, the heating assembly 13 provided in the present disclosure has the heater 131 including at least two sub-heaters 1311 and a connecting portion 1310 that connects two adjacent sub-heaters 1311. The connecting portion 1310 prevents temperatures of the two adjacent sub-heaters 1311 from affecting each other, and therefore, each portion of sub-heater 1311 is controlled independently. The temperature of each portion may not be out of control, or a time length of the temperature being out of control may be minimized, such that energy consumption is reduced, and the usage experience is improved.

**[0037]** As shown in FIG. 4, FIG. 4 is a structural schematic view of a portion of the heating assembly according to an embodiment of the present disclosure.

**[0038]** In an embodiment, as shown in FIG. 4, the two adjacent sub-heaters 1311 are hollow columns that are coaxially arranged with each other and are spaced apart from each other. The two adjacent sub-heaters 1311 are connected to each other by the connecting portion 1310. A thermal conductivity of the connecting portion 1310 is lower than that of the sub-heaters 1311. That is, a plurality of sub-heaters 1311 are coaxially arranged with each other and are spaced apart from each other, and every two adjacent sub-heaters 1311 of the plurality of sub-heaters 1311 are connected to each other by the connecting portion 1310. Each sub-heater 1311 is surrounded by one electromagnetic member 132. That is, the sub-heater 1311 and the electromagnetic member 132 are provided in one-to-one correspondence with each other. The sub-heater 1311 is made of a ferromagnetic material, such as 403 stainless steel.

**[0039]** The sub-heater 1311 is a hollow cylinder or a hollow column of other shapes. The sub-heater 1311 may be arranged cooperatively with other elements of the heating assembly 13, as long as the aerosol-generating matrix 100 is capable of being inserted into the receiving cavity 10 defined by the at least two sub-heaters 1311. Detailed structure of the sub-heater may be determined based on demands.

**[0040]** The connecting portion 1310 may be an annular structure, such as a ring. The annular structure of the connecting portion 1310 is arranged to be adapted with the hollow columnar structure of the sub-heater 1311, such that each end of the connecting portion 1310 is connected to one sub-heater 1311, and therefore, the at least the two sub-heaters 1311 cooperatively form a one-piece heater 131. In some embodiments, each end of the connecting portion 1310 is socketed to an outer side of the respective sub-heater 1311. An inner surface of the connecting portion 1310 is aligned with an inner surface of the heater 131 to ensure that the heater has a smooth inner surface (as shown in FIG. 5, FIG. 5 is a structural schematic view of a portion of the heater of the heating assembly shown in FIG. 4). In this way, the aerosol-generating substrate 100 may be easily inserted into the receiving cavity 10 defined by the heater 131. The connecting portion 1310 may alternatively be connected to the sub-heater 1311 in other ways, as long as temperatures of the two adjacent sub-heater 1311 do not affect each other, and insertion of the aerosol-generating substrate 100 into the receiving cavity 10 is not affected.

**[0041]** The connecting portion 1310 may alternatively be at least two blocks. For each block, two ends are connected to the two adjacent sub-heaters 1311, respectively. The at least two blocks are spaced apart from each other along a circumferential direction of the sub-heater 1311. In this way, temperature interference between the two adjacent sub-heaters 1311 is further reduced. The block may be fixed to the sub-heater 1311 by adhesive or the like to enable the at least two sub-heaters 1311 to cooperatively form a one-piece heater 131. It is understood that the one-piece structure herein refers not to a one-piece molding, but rather to an overall structure.

**[0042]** In a specific embodiment, the heater 131 includes two sub-heaters 1311 and a connecting portion 1310 that connects the two sub-heaters 1311.

**[0043]** As shown in FIG. 6, FIG. 6 is a structural schematic view of the heater of the heating assembly shown in FIG. 4.

**[0044]** The heating assembly 13 further includes at least two temperature measuring traces 133. The at least two temperature measuring traces 133 and the at least two sub-heaters 1311 are arranged in one-to-one correspondence with each other. That is, one temperature measuring trace 133 is arranged on one sub-heater 1311. The temperature measuring trace 133 is configured to measure the temperature of the corresponding sub-heater 1311, facilitating the controller of the power supply assembly 14 to control the temperature of each sub-heater 1311. The at least two temperature measuring traces 133 are arranged independently from each other. The independent arrangement of the at least two temperature measuring traces 133 ensures accuracy of the temperature measurement, preventing the at least two temperature measuring traces 133 from affecting each other. For example, the at least two temperature measurement lines 133 are connected to different circuit

boards. In another example, the at least two temperature measurement lines 133 are connected in parallel with each other and then connected to a same circuit board.

**[0045]** Specifically, the temperature measurement line 133 is arranged on an outer side of the sub-heater 1311, and an insulating layer (not shown in the drawing) is disposed between the sub-heater 1311 and the temperature measurement line 133. In the present embodiment, the temperature measurement line 133 includes a temperature measurement line layer 1331, a positive electrode 1332 and a negative electrode 1333, and the positive electrode 1332 and the negative electrode 1333 are connected to the temperature measurement line layer 1331. In other embodiments, a temperature sensor may be arranged to sense the temperature of the sub-heater 1311, which may be determined based on demands.

**[0046]** In an embodiment, the positive electrode 1332 and the negative electrode 1333 of the temperature measuring traces 133 are arranged in close proximity to each other. For example, the heating generator 131 includes a first sub-heater (not shown) and a second sub-heater (not shown). The heating assembly 13 includes a first temperature measuring trace (not shown) arranged in correspondence with the first sub-heater and a second temperature measuring trace (not shown) arranged in correspondence with the second sub-heater. The first temperature measuring trace includes a first temperature measuring trace layer (not shown), a first positive electrode (not shown), and a first negative electrode (not shown). The second temperature measuring trace includes a second temperature measuring trace layer (not shown), a second positive electrode 1332, and a second negative electrode 1333 (not shown). The first positive electrode and the first negative electrode are disposed at an end portion of the first sub-heater away from the second sub-heater. The second positive electrode and the second negative electrode are disposed at an end portion of the second sub-heater away from the first sub-heater.

**[0047]** In an embodiment, the positive electrodes 1332 and the negative electrodes 1333 of the at least two temperature measurement lines 133 are disposed at an end of the heater 131. That is, the positive electrodes 1332 and the negative electrodes 1333 of the at least two temperature measurement lines 133 are disposed at an end of an uppermost or a lowermost sub-heater 1311. For example, the heater 131 includes a first sub-heater (not shown) and a second sub-heater (not shown). The heating assembly 13 includes the first temperature measuring trace (not shown) arranged in correspondence with the first sub-heater and the second temperature measuring trace (not shown) arranged in correspondence with the second sub-heater. The first temperature measuring trace includes the first temperature measuring trace layer (not shown), the first positive electrode (not shown) and the first negative electrode (not shown). The second temperature measurement line includes the second temperature measurement line layer (not shown), the second positive electrode (not shown), and the second negative electrode (not shown). The first positive electrode, the first negative electrode, the second positive electrode, and the second negative electrode are all disposed at the end portion of the second sub-heater away from the first sub-heater. The first positive electrode, the first negative electrode, the second positive electrode, and the second negative electrode are disposed along a circumferential direction of the end portion of the heater 131 (i.e., the end portion of the second sub-heater away from the first sub-heater). In this way, the temperature measuring trace layer 1331 of each of the two temperature measuring traces 133 is enabled to be electrically connected to the power supply assembly 14. In some embodiments, the first positive electrode, the first negative electrode, the second positive electrode, and the second negative electrode are arranged independently from each other. That is, the positive electrode 1332 and the negative electrode 1333 of one of the at least two temperature measurement line layers 1331 are independent from the positive electrodes 1332 and the negative electrode 1333 of another one of the at least two temperature measurement line layers 1331, i.e., the at least two temperature measurement line layers 1331 do not share the positive electrode 1332 and the negative electrode 1333.

**[0048]** In some embodiments, since the end portion of the heater 131 has a limited space, the at least two temperature measuring trace layers 1331 may share the positive electrode 1332 or the negative electrode 1333. That is, the at least two temperature measuring trace layers 1331 use one positive electrode, and the first negative electrode and the second negative electrode are arranged independently from each other. Alternatively, the first positive electrode and the second positive electrode are arranged independently from each other, the at least two temperature measuring trace layers 1331 use one negative electrode. In the present embodiment, the two temperature measurement line layers 1331 use one negative electrode 1333 (as shown in FIG. 6).

**[0049]** It is understood that, in order to accurately measure the temperature of the sub-heater 1311, the temperature measuring trace layer 1331 is disposed only on the outer side of the corresponding sub-heater 1311. When positive electrodes 1332 and negative electrodes 1333 of at least two temperature measurement line layers 1331 are disposed at a first end of the heater 131, the positive electrode 1332 and negative electrode 1333 of the temperature measurement line 133 corresponding to the sub-heater 1311 extend from the sub-heater 1311 to the first end. In this way, the temperature measurement line layer 1331 is arranged only on the outer side of the corresponding sub-heater 1311, preventing the same temperature measurement line layer 1331 from measuring temperatures inaccurately.

**[0050]** In a specific embodiment, as shown in FIG. 6, the heater 131 includes a first sub-heater 1311b and a second sub-heater 1311c. It is understood that the first sub-heater 1311b and the second sub-heater 1311c

have a same function as the sub-heater 1311 described in the above. In order to facilitate description of the sub-heater 1311 in FIG. 6, the sub-heater is labeled as above. Each sub-heater 1311 is respectively arranged with one temperature measurement line 133. That is, the heating assembly 13 includes a first temperature measurement line 133a and a second temperature measurement line 133b. It is understood that the first temperature measurement line 133a and the second temperature measurement line 133b have a same function as the temperature measurement line 133 described in the above and are labeled as such to facilitate description of the temperature measurement line 133 in FIG. 6. The first temperature measuring trace 133a includes the first temperature measuring trace layer 1331a, the first positive electrode 1332a, and the negative electrode 1333. The first temperature measuring trace layer 1331a is arranged in correspondence with the first sub-heater 1311b, and the first temperature measuring trace layer 1331a is disposed in a region corresponding to the first sub-heater 1311b only. The second temperature measuring trace 133b includes the second temperature measuring trace layer 1331b, the second positive electrode 1332b, and the negative electrode 1333. The second temperature measuring trace layer 1331b is arranged in correspondence with the second sub-heater 1311c, and the second temperature measuring trace layer 1331b is disposed in the region corresponding to the second sub-heater 1311c only. The first temperature measurement line 133a and the second temperature measurement line 133b use one negative electrode 1333.

**[0051]** Positive electrodes 1332 and negative electrodes 1333 of the first temperature measurement line 133a and the second temperature measurement line 133b are all disposed at the end portion of the second sub-heater 1311c away from the first sub-heater 1311b. That is, the first positive electrode 1332a and the first negative electrode 1333 of the first temperature measurement line 133a and the second positive electrode 1332b and the second negative electrode 1333 of the second temperature measurement line 133b are all disposed at the end portion of the second sub-heater 1311c away from the first sub-heater 1311b.

**[0052]** As shown in FIG. 6, the first positive electrode 1332a, the second positive electrode 1332b, and the negative electrode 1333 are successively arranged front the left to the right along the circumferential direction to surround the sub-heater 1311. The first positive electrode 1332a is connected to an end portion of the first temperature measurement line layer 1331a through a lead 1334. The other end portion of the first temperature measurement line layer 1331a is connected to the negative electrode 1333 through the lead 1334. An end portion of the second temperature measurement line layer 1331b is connected to the second positive electrode 1332b, and the end portion of the second temperature measurement line layer 1331b is connected to the negative electrode 1333. The temperature measurement line 133 further includes the lead 1334. A first end of the lead 1334 of the first temperature measurement line 133a is connected to the first temperature measurement line layer 1331a of the first temperature measurement line 133a. A second end of the lead 1334 of the first temperature measurement line 133a passes through a region where the connecting portion 1310 and the second measurement line layer 1331b are located to be connected to the first positive electrode 1332a or the first negative electrode 1333 of the first measurement line 133a. A first end of the lead 1334 of the second temperature measurement line 133b is connected to the second temperature measurement line layer 1331b of the second temperature measurement line 133b. A second end of the lead 1334 of the second temperature measurement line 133b is directly connected to the second positive electrode 1332b or the second negative electrode 1333 of the second temperature measurement line 133b. Arrangement of the lead may be determined based on demands. It is understood that the end portion of the temperature measurement line layer 1331 that is disposed closer to the negative electrode 1333 is connected to the negative electrode 1333.

**[0053]** As shown in FIG. 7 and FIG. 8, FIG. 7 is a structural schematic view of the heater of the heating assembly according to another embodiment of the present disclosure; and FIG. 8 is a structural schematic view of the heater in the heating assembly according to still another embodiment of the present disclosure.

**[0054]** In yet another embodiment, the connecting portion 1310 is integrally formed with the at least two sub-heaters 1311. The heater 131 further includes a partition structure defined in the connecting portion 1310. The connecting portion 1310 is annular. A side wall of the connecting portion 1310 defines openings 1313 to form the partition structure. In a specific embodiment, the heater 131 includes two sub-heaters 1311 and the connecting portion 1310 that connects the two sub-heaters 1311. The connecting portion 1310 is integrally molded with the two sub-heaters 1311 (as shown in FIG. 7 and FIG. 8).

**[0055]** Further, in order to minimize the temperature interference between adjacent sub-heaters 1311, the number of openings 1313 defined between the adjacent sub-heaters 1311 is more than one. The more than one openings 131 are spaced apart from each other are disposed along a circumference of the connecting portion 1310.

**[0056]** In some embodiments, the openings 1313 may be through holes. A cross section of each through hole may be circular (as shown in FIG. 7). The openings 1313 may alternatively be cutouts (as shown in FIG. 8). Compared to the openings 1313 in FIG. 7, the openings 1313 in FIG. 8 allows a connecting area between the adjacent sub-heaters 1311 to be smaller, further reducing heat conduction between the adjacent sub-heaters 1311.

**[0057]** The electromagnetic members 132 of the heating assembly 13 provided in FIG. 7 and FIG. 8 are provided in the same manner as the electromagnetic members 132 of the heating assembly 13 provided in FIG. 4,

which will not be repeated herein.

**[0058]** The heating assembly 13 provided in FIG. 7 and FIG. 8 further includes at least two temperature measurement lines 133. The temperature measurement lines 133 is provided in a same manner as the temperature measurement lines 133 of the heating assembly 13 provided in FIG. 4, which will not be repeated herein.

**[0059]** In yet another embodiment, the connecting portion 1310 of the heating assembly 13 may be air. That is, the at least two sub-heaters 1311 are spaced apart from each other. Both of the at least two sub-heaters 1311 are fixed to the fixation bracket. A fixing method may be determined according to demands. Other elements of the heating assembly 13 are provided in the same manner as those of the heating assembly 13 provided in FIGS. 4, 7, and 8.

**[0060]** The heating assembly includes the heater and at least two electromagnetic members. The heater is configured to generate, by sensing a magnetic field, heat to heat the aerosol-generating substrate. The heater includes at least two sub-heaters and a connecting portion that connects two adjacent sub-heaters. Each sub-heater has a receiving cavity to receive a portion of the aerosol-generating substrate. The at least two electromagnetic members are arranged in one-to-one correspondence with the at least two sub-heaters and are configured to provide a magnetic field. In this way, the temperature of each portion of the heater is controlled respectively. Therefore, when the heater heats one portion of the aerosol-generating substrate, and the temperature of another portion may not increase due to heat conduction, such that the controller may not lose control of the temperature of the another portion, and usage experience may be improved.

**[0061]** The above describes only the implementation of the present disclosure, but does not limit the scope of the present disclosure. Any equivalent structure or equivalent process transformation, which is performed based on the specification and the accompanying drawings of the present disclosure, applied directly or indirectly in other related fields, shall be equivalently included in the scope of the present disclosure.

## Claims

**1.** A heating assembly, comprising:

a heater, configured to generate, by sensing a magnetic field, heat and heat an aerosol-generating substrate; wherein, the heater comprises at least two sub-heaters and a connecting portion that connects two adjacent sub-heaters of the at least two sub-heaters; each of the at least two sub-heaters has a receiving cavity to receive a portion of the aerosol-generating substrate;
at least two electromagnetic members, arranged in correspondence with the at least two sub-heaters and configured to provide the magnetic field.

**2.** The heating assembly according to claim 1, wherein, the heater comprises two sub-heaters and the connecting portion that connects the two sub-heaters; the connecting portion and the two sub-heaters are configured as a one-piece and integral structure; the heater further comprises a partition structure defined in the connecting portion; the connecting portion is annular, and a side wall of the connecting portion defines openings to serve as the partition structure.

**3.** The heating assembly according to claim 2, wherein, the number of the openings is more than one, and the more than one openings are spaced apart from each other and are located along the circumference of the connecting portion.

**4.** The heating assembly according to claim 1, further comprising at least two temperature measuring traces, wherein, the at least two temperature measuring traces are arranged in correspondence with the at least two sub-heaters; each of the at least two temperature measuring traces is configured to measure a temperature of a corresponding one of the at least two sub-heaters; and the at least two temperature measuring traces are arranged independently from each other.

**5.** The heating assembly according to claim 4, wherein, the temperature measuring trace is disposed on the outer side of the corresponding sub-heater; an insulating layer is disposed between the sub-heater and the temperature measuring trace; each temperature measuring trace comprises a temperature measuring trace layer, a positive electrode, and a negative electrode, and the positive electrode and the negative electrode are connected to the temperature measuring trace layer.

**6.** The heating assembly according to claim 5, wherein, the heater comprises a first sub-heater and a second sub-heater, the heating assembly comprises a first temperature measurement line arranged correspondingly to the first sub-heater and a second temperature measurement line arranged correspondingly to the second sub-heater, the first temperature measurement line comprises a first temperature measurement line layer, a first positive electrode, and a first negative electrode; and the second temperature measurement line comprises a second temperature measurement line layer, a second positive electrode, and a second negative electrode;

the first positive electrode and the first negative electrode are disposed at the end of the first sub-heater away from the second sub-heater; the

second positive electrode and the second negative electrode are disposed at an end of the second sub-heater away from the first sub-heater;
or
the first positive electrode, the first negative electrode, the second positive electrode, and the second negative electrode are all disposed at the end of the second sub-heater away from the first sub-heater.

**7.** The heating assembly according to claim 6, wherein, the first positive electrode, the first negative electrode, the second positive electrode, and the second negative electrode are arranged independently from each other;
or

the first positive electrode and the second positive electrode share a common electrode, and the first negative electrode and the second negative electrode are provided independently from each other;
or
the first positive electrode and the second positive electrode are provided independently from each other, and the first negative electrode and the second negative electrode share a common electrode.

**8.** The heating assembly according to claim 6, wherein, the first positive electrode, the first negative electrode, the second positive electrode, and the second negative electrode are all disposed at the end of the second sub-heater away from the first sub-heater; and
the temperature measuring trace further comprises a lead, a first end of the lead of the first temperature measuring trace is connected to the first temperature measuring trace layer, a second end of the lead of the first temperature measuring trace passes through a region where the connecting portion and the second temperature measuring trace are located and is further connected to the first positive electrode or the first negative electrode of the first temperature measuring trace.

**9.** The heating assembly according to claim 1, wherein, the heater comprises two sub-heaters and the connecting portion that connects the two sub-heaters; and the thermal conductivity of the connecting portion is lower than the thermal conductivity of the two sub-heaters .

**10.** The heating assembly according to claim 9, wherein, the two sub-heaters are two hollow cylinders; the two sub-heaters are arranged coaxially with each other and are spaced apart from each other; the connecting portion is annular; the connecting portion is in cooperation with the two hollow cylindrical sub-heaters; each of two ends of the connecting portion is connected to a corresponding one of the two sub-heaters.

**11.** An aerosol-generating device, comprising: the heating assembly according to any one of claims 1 to 10 and a power supply assembly; the power supply assembly is electrically connected to the electromagnetic members and is configured to supply power to the electromagnetic members.

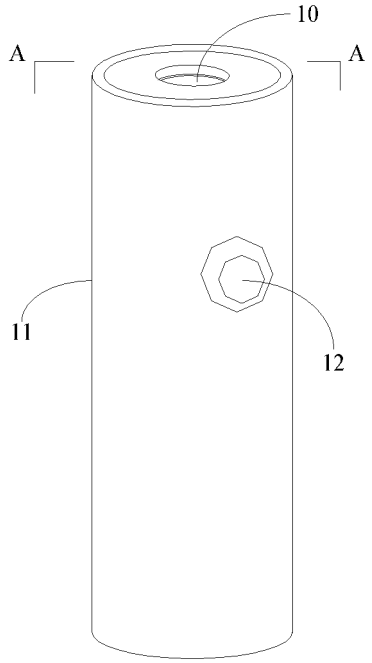



FIG. 1

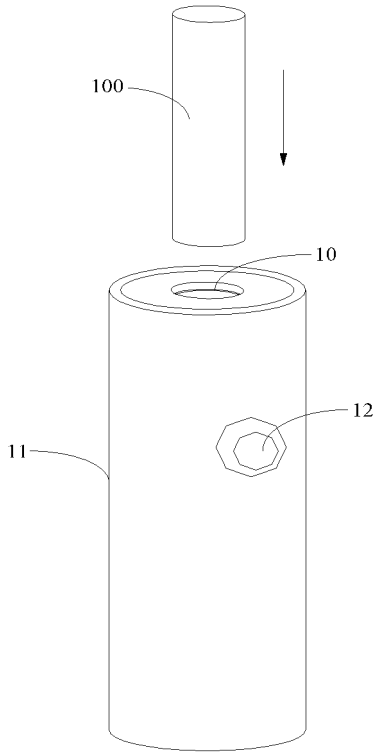



FIG. 2

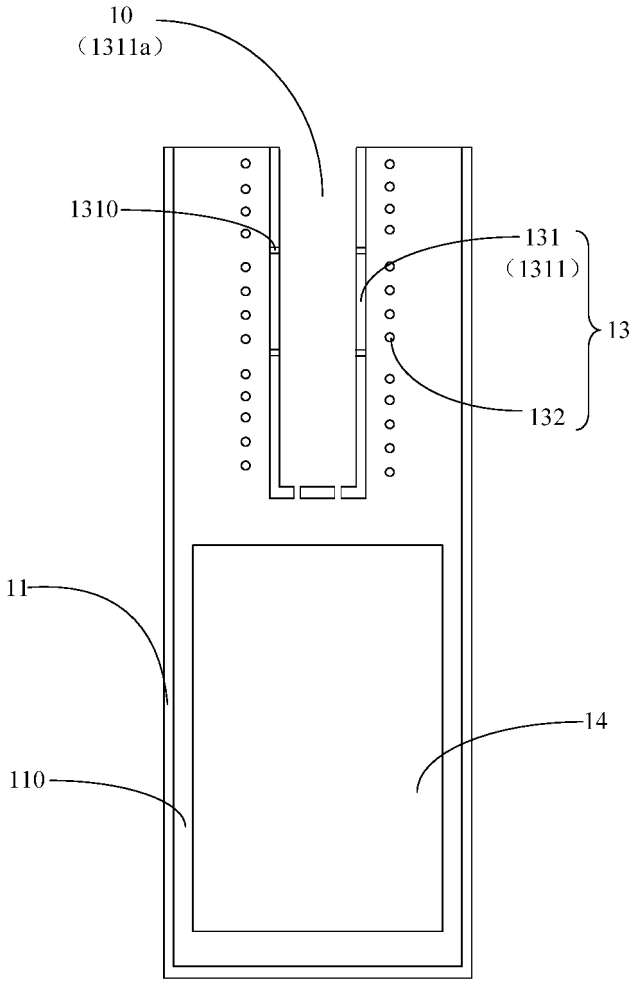



FIG. 3

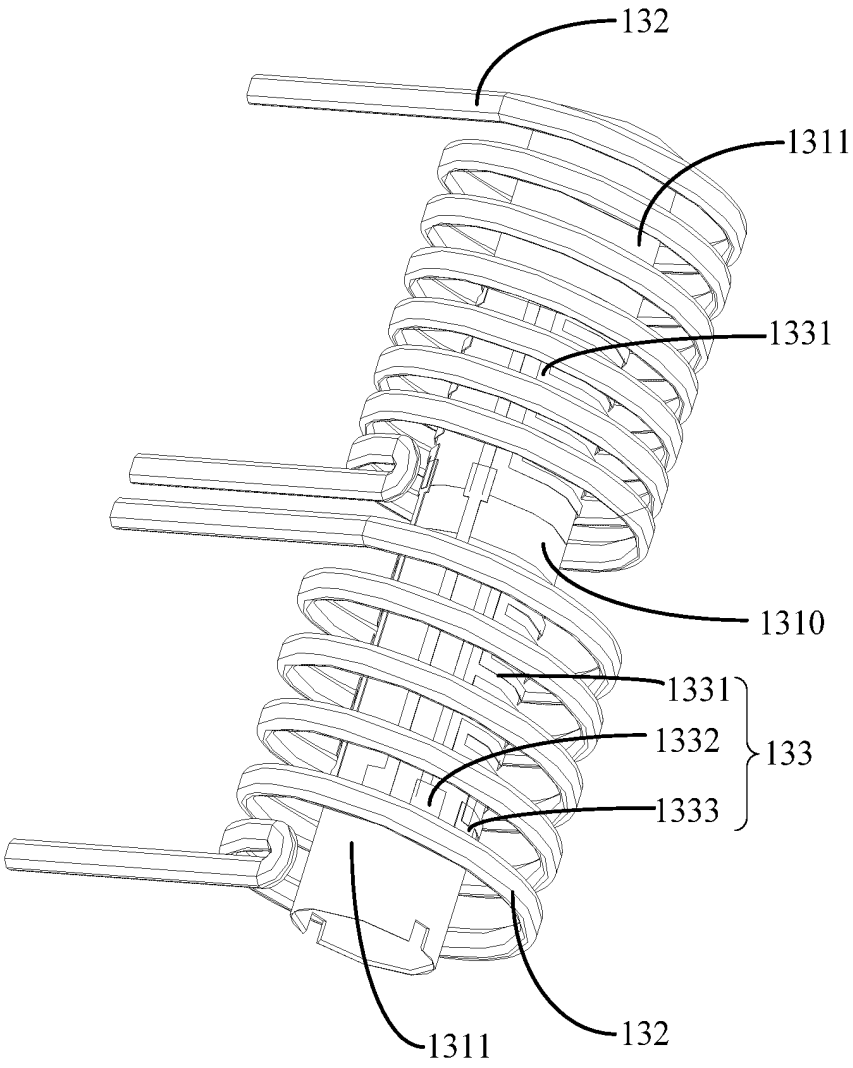



FIG. 4

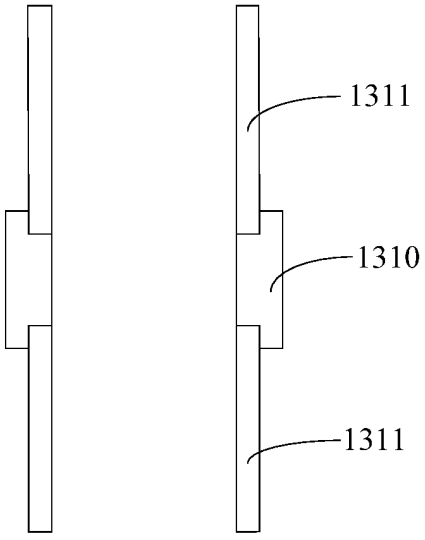



FIG. 5

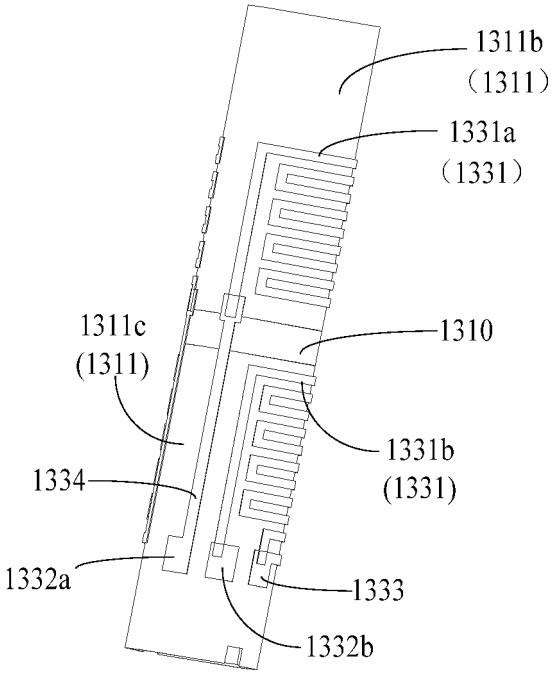
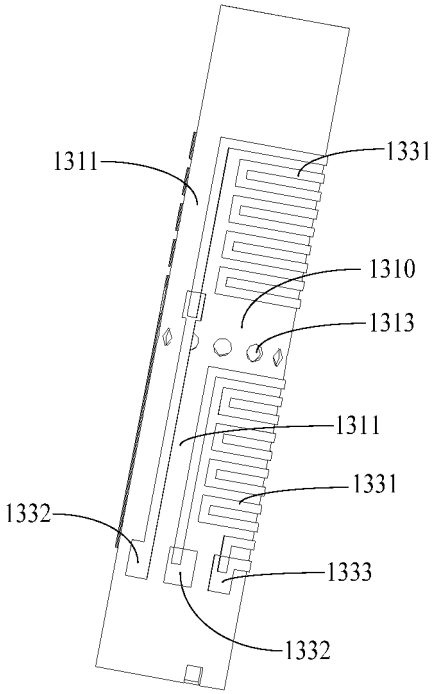

1311b
(1311)
1331a
(1331)
1311c
(1311)
1310
1331b
(1331)
1334
1332a
1333
1332b

FIG. 6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1331
1310
1313
1311
1331
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1333
1332

FIG. 7

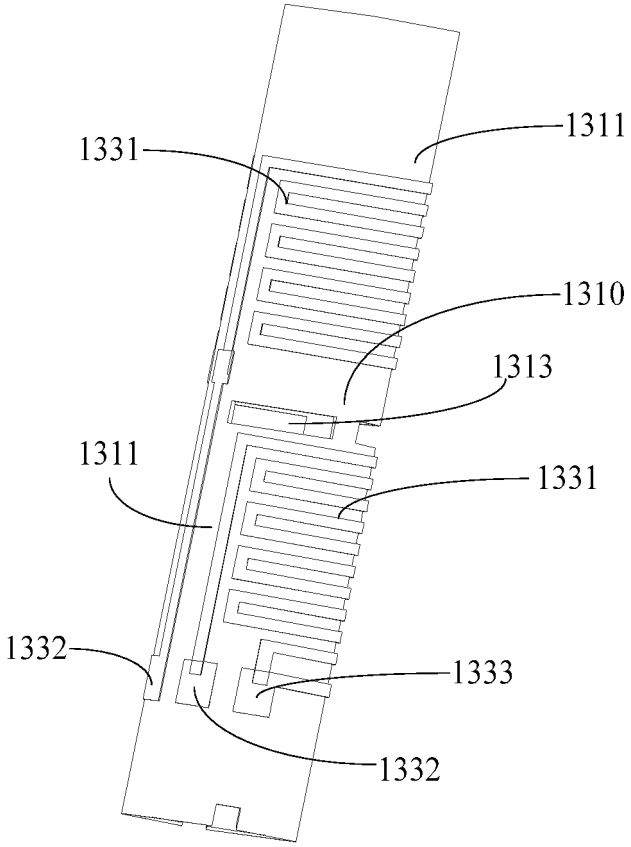


FIG. 8

## INTERNATIONAL SEARCH REPORT

International application No.
**PCT/CN2022/129350**

**A. CLASSIFICATION OF SUBJECT MATTER**

A24F 40/465(2020.01)i; A24F 40/57(2020.01)i; A24F 40/20(2020.01)i; A24F 47/00(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, 电磁, 磁场, 线圈, 发热, 加热, 第一, 第二, 测温, 正极, 正电极, 负极, 负电极, magnetic field, electromagnetic, coil, heat+, first, second, positive, negative, pole, electrode, temperature

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

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| X | CN 112752520 A (PHILIP MORRIS PRODUCTS S.A.) 04 May 2021 (2021-05-04)<br>description, paragraphs [0089], [0123], [0125]-[0127], [0129], [0137], [0139] and [0150], and figures 2, 3, 5, 7 and 8 | 1-11 |
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☐ Further documents are listed in the continuation of Box C. ☑ See patent family annex.

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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
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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 |
|---|---|
| **28 December 2022** | **18 January 2023** |
| Name and mailing address of the ISA/CN<br>**China National Intellectual Property Administration (ISA/CN)**<br>**No. 6, Xitucheng Road, Jimenqiao, Haidian District, Beijing 100088, China**<br>Facsimile No. **(86-10)62019451** | Authorized officer<br><br>Telephone No. |

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

**INTERNATIONAL SEARCH REPORT**
**Information on patent family members**

International application No.
**PCT/CN2022/129350**

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