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(54) **HEAT GENERATING BODY, HEAT GENERATING BODY ASSEMBLY AND HEATING DEVICE**

(57) A heat generating body (100, 200), a heat generating assembly (10, 20) and a heating device. The heat generating body (100, 200) comprises a base body (110, 210), a heat generating circuit (130, 230) and a temperature measuring circuit (150, 250). The base body (110, 210) is provided with a bottom surface (115), the base body (110, 210) is provided with a heat generating area (119, 319) and an electrode arrangement area (117) adjacent to the heat generating area (119, 319), and the electrode arrangement area (117) is close to the bottom surface (115) compared with the heat generating area (119, 319); the heat generating circuit (130, 230) is located on the base body (110, 210), and the heat generating circuit (130, 230) comprises a heat generating part (131, 231) and a heat generating electrode (133, 233) electrically connected to the heat generating part (131, 231), the heat generating part (131, 231) being located in the heat generating area (119, 319), and the heat generating electrode (133, 233) being located in the electrode arrangement area (117); the temperature measuring circuit (150, 250) is located on the base body (110, 210), the temperature measuring circuit (150, 250) and the heat generating circuit (130, 230) are arranged spaced apart, and the temperature measuring circuit (150, 250) comprises a temperature measuring part (151, 251, 351) and a temperature measuring electrode (153, 253) electrically connected to the temperature measuring part (151, 251, 351); and the heat generating area (119, 319) comprises a high-temperature area (119a), and the temperature measuring part (151, 251, 351) is located in the high-temperature area (119a). In an initial heating stage of the heat generating body (100, 200), the deviation between an actual temperature and a planned temperature is small.

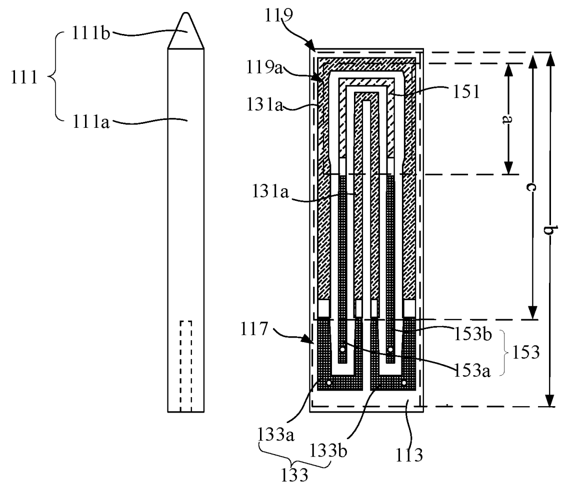

FIG. 3

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Description

CROSS-REFERENCES TO RELATED APPLICATIONS

[0001] This application claims priority to Chinese Patent Application No. 202011066148.7, entitled "HEAT GENERATING BODY, HEAT GENERATING BODY ASSEMBLY AND HEATING DEVICE" and filed with the Chinese Patent Office on September 30, 2020, the entire contents of which are incorporated herein by reference.

TECHNICAL FIELD

[0002] The present application relates generally to the technical field of heat-not-burn cigarette devices, and more particularly, to a heat generating body, a heat generating assembly and a heating device.

BACKGROUND

[0003] A heat-not-burn cigarette device mainly bakes tobacco at low a temperature ranging from 200 °C to 400 °C, so as to produce smoke without a large number of harmful substances brought by pyrolysis. Currently, the heat-not-burn cigarette device mainly generates heat through a heat generating body to heat tobacco or a cartridge. However, during actual use, in an initial heating stage of a conventional heat generating body, a temperature is prone to a large deviation from a planned temperature, resulting in a mismatch with a baking temperature of the tobacco or cartridge and poor smoking experience.

SUMMARY

[0004] Based on the above, there is a need to provide a heat generating body that can reduce the deviation between an actual temperature in an initial heating stage and a planned temperature.

[0005] A heat generating body is provided, including:

a base body having a bottom surface, the base body being provided with a heat generating area and an electrode arrangement area adjacent to the heat generating area, the electrode arrangement area being close to the bottom surface;

a heat generating circuit arranged on the base body, the heat generating circuit including a heat generating part and a heat generating electrode electrically connected to the heat generating part, the heat generating part forming the heat generating area on the base body, the heat generating electrode being arranged in the electrode arrangement area; and

a temperature measuring circuit located on the base body, the temperature measuring circuit and the heat generating circuit being arranged spaced apart, the temperature measuring circuit including a temperature measuring part and a temperature measuring electrode electrically connected to the temperature measuring part, the heat generating area including a high-temperature area, the temperature measuring part being located in the high-temperature area.

[0006] In the above heat generating body, the heat generating circuit and the temperature measuring circuit are arranged independently of each other, and the temperature measuring part of the heat generating body is arranged in the high-temperature area of the heat generating area, so that the temperature measuring part can more accurately reflect an overall temperature of the heat generating body, so as to control a temperature in an initial heating stage more accurately, and the deviation between an actual temperature and a planned temperature in the initial heating stage is smaller.

[0007] In one embodiment, the high-temperature area and the electrode arrangement area are arranged spaced apart, and the temperature measuring electrode extends from the heat generating area to the electrode arrangement area; or the high-temperature area is arranged adjacent to the electrode arrangement area, and the temperature measuring electrode is entirely arranged in the electrode arrangement area.

[0008] In one embodiment, the base body is in a shape of a column or a strip sheet, the electrode arrangement area and the heat generating area are arranged in a length direction of the base body, and the ratio of the length of the high-temperature area in the length direction of the base body to the sum of lengths of the heat generating area and the electrode arrangement area in the length direction of the base body is 1: (2 to 5).

[0009] In one embodiment, the ratio of the length of the high-temperature area in the length direction of the base body to the length of the heat generating area in the length direction of the base body is 1: (5 to 4).

[0010] In one embodiment, the heat generating electrode includes a first electrode and a second electrode spaced from the first electrode, and the temperature measuring electrode includes a third electrode and a fourth electrode spaced from the third electrode, the first electrode, the second electrode, the third electrode and the fourth electrode being all connected to lead wires, and the lead wires being spaced from one another.

[0011] In one embodiment, the heat generating part is U-shaped, an end of the heat generating part is electrically connected to the first electrode, another end of the heat generating part is electrically connected to the second electrode, the temperature measuring part is close to a U-shaped bottom of the heat generating part, and the temperature measuring part is away from an opening formed by the two ends of the heat generating part; and/or the temperature measuring part is U-shaped, an end of the temperature measuring part is electrically connected to the third electrode, and another end of the temperature measuring part is electrically connected to the fourth electrode.

[0012] In one embodiment, the heat generating part includes a plurality of heat generating wires arranged spaced apart, an end of each of the heat generating wires being electrically connected to the first electrode, and another end of each of the heat generating wires being electrically connected to the second electrode, and the temperature measuring part is located in a space between U-shaped bottoms of the adjacent heat generating wires and is spaced from the heat generating wires.

[0013] In one embodiment, the heat generating part includes two heat generating wires arranged spaced apart, and the first electrode and the second electrode are both U-shaped; and part of the third electrode is located on an inner side of the first electrode, and part of the fourth electrode is located on an inner side of the second electrode.

[0014] In one embodiment, the heat generating part includes a heat generating wire, and the heat generating area includes a high-temperature area and a non-high-temperature area. The heat generating wire is arranged in both the high-temperature area and the non-high-temperature area. The width of the heat generating wire in the high-temperature area is less than the width of the heat generating wire in the non-high-temperature area.

[0015] In one embodiment, the heat generating wire includes an electrode section, a middle section, and a top section connected successively. The electrode section is close to the heat generating electrode, the top section is close to the temperature measuring part, and each of the widths of the electrode section and the top section is greater than the width of the middle section.

[0016] In one embodiment, the base body is in a shape of a column or a strip sheet. The base body includes a body and an insulating layer located on the body. The body includes a base part and a tip part connected to the base part, the tip part extends in a direction away from the base part, the width of the cross section of the tip part gradually decreases in a direction away from the base part, the insulating layer is wound on the base part, and the heat generating circuit and the temperature measuring circuit are located on the insulating layer.

[0017] In one embodiment, the base part is a ceramic base part or a stainless steel base part, and the insulating layer is a glass ceramic insulating layer or a low-temperature ceramic insulating layer; and/or

the insulating layer has a thickness ranging from 0.02 mm to 0.5 mm.

[0018] In one embodiment, at room temperature, the resistance of the heat generating part ranges from 0.5 Q to 2 Q; and/or

at the room temperature, the resistance of the temperature measuring part ranges from 1.5 Ω to 20 Ω.

[0019] In one embodiment, the heat generating part is a positive temperature coefficient thermistor; and/or

the temperature measuring part is a positive temperature coefficient thermistor; and/or

the sheet resistance of the heat generating part ranges from 20 mΩ/□ to 200 mΩ/□; and/or

the sheet resistance of the temperature measuring part ranges from 20 mΩ/□ to 200 mΩ/□; and/or

the heat generating part includes at least one of nickel (Ni), silver (Ag), palladium (Pd), platinum (Pt) and ruthenium (Ru); and/or

the temperature measuring part includes at least one of Ni, Ag, Pd, Pt and Ru.

[0020] In one embodiment, the resistance temperature coefficient of the heat generating part is less than that of the temperature measuring part.

[0021] In one embodiment, the material of the heat generating part is selected from at least one of a nickel-chromium alloy, a tantalum alloy, a gold-chromium alloy and a nickel-phosphorus alloy; and/or

the material of the temperature measuring part is selected from at least one of copper (Cu), Ni, manganese (Mn) and Ru.

[0022] In one embodiment, the sheet resistance of the heat generating part is no more than 5 mΩ/□, and the sheet resistance of the temperature measuring part is no more than 5 mΩ/□.

[0023] In one embodiment, the heat generating body further includes a protective layer, the protective layer covering the heat generating part, the temperature measuring part and part of the temperature measuring electrode.

[0024] A heat generating assembly is also provided, including a mounting seat and a heat generating body mounted on the mounting seat, the heat generating body being the heat generating body described above.

[0025] A heating device is further provided, including a housing and the heat generating assembly described above.

BRIEF DESCRIPTION OF THE DRAWINGS

[0026]

FIG. 1 is a perspective view of a heat generating assembly according to an implementation.

FIG. 2 is an exploded view of the heat generating assembly shown in FIG. 1.

FIG. 3 is an exploded view of a heat generating body of the heat generating assembly shown in FIG. 1.

FIG. 4 is another exploded view of the heat generating body of the heat generating assembly shown in FIG. 1.

FIG. 5 is a structural diagram illustrating the heat generating assembly shown in FIG. 1 after a sealing member and a mounting cover are hidden.

FIG. 6 is a front view of the heat generating assembly shown in FIG. 1.

FIG. 7 is a sectional view of the heat generating assembly shown in FIG. 6 along a line A-A.

FIG. 8 is a perspective view of a heat generating assembly according to another implementation.

FIG. 9 is an exploded view of the heat generating assembly shown in FIG. 8.

FIG. 10 is another exploded view of the heat generating assembly shown in FIG. 8.

FIG. 11 is a structural diagram illustrating a heat generating body of the heat generating assembly shown in FIG. 8 after a protective layer is hidden.

FIG. 12 is a structural diagram illustrating the heat generating assembly shown in FIG. 8 after a mounting cover is hidden.

FIG. 13 is a temperature control curve of a heat generating assembly according to Embodiment 1.

FIG. 14 is a structural diagram illustrating a temperature measuring circuit and a heat generating circuit of a heat generating assembly according to Comparative Example 1.

FIG. 15 is a temperature control curve of the heat generating assembly according to Comparative Example 1.

Reference numerals:

[0027]

10. heat generating assembly; 100. heat generating body; 110. base body; 111. body; 113. insulating layer; 111a. base part; 111b. tip part; 115. bottom surface; 119. heat generating area; 117. electrode arrangement area; 119a. high-temperature area; 130. heat generating circuit; 131. heat generating part; 133. heat generating electrode; 131a. heat generating wire; 133a. first electrode; 133b. second electrode; 150. temperature measuring circuit; 151. temperature measuring part; 153. temperature measuring electrode; 153a. third electrode; 153b. fourth electrode; 170. protective layer; 101. mounting seat; 101a. mounting base; 101b. mounting cover; 103. sealing member; 105. clamping member; 140. lead wire;

20. heat generating assembly; 200. heat generating body; 210. base body; 211. body; 211c. first protrusion; 211d. second protrusion; 213. insulating layer; 230. heat generating circuit; 231. heat generating part; 233. heat generating electrode; 233a. first electrode; 233b. second electrode; 250. temperature measuring circuit; 251. temperature measuring part; 253. temperature measuring electrode; 253a. third electrode; 253b. fourth electrode; 270. protective layer; 201. mounting seat; 201a. mounting base; 201c. chute; 201d. slider; 201f. clamping slot; 201b. mounting cover; 203. sealing member;

319. heat generating area; and 351. temperature measuring part.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0028] To facilitate understanding of the present application, a more comprehensive description of the present application will be given below. The present application may be implemented in many different forms and is not limited to the embodiments described herein. Rather, these embodiments are provided to make the contents disclosed in the present application more fully understood.

[0029] It is to be noted that, when an element is referred to as "fixed to" another element, it may be directly on the another element or one or more intermediate element may exist therebetween. When one element is referred to as "connected to" another element, it may be directly on the another element or one or more intermediate element may exist therebetween. The orientation or position relationship, when indicated by the terms "vertical", "horizontal", "left", "right", "upper", "lower", "inner", "outer", "bottom", etc., is based on the orientation or position relationship shown in the accompanying drawings and are intended to facilitate the description only, rather than indicating or implying that the device or element referred to must have a particular orientation or be constructed and operated in a particular orientation, and therefore cannot be interpreted as limiting the present application. In addition, the terms "first" and "second" are used for descriptive purposes only, which cannot be construed as indicating or implying a relative importance.

[0030] Unless otherwise defined, all technical and scientific terms used herein have the same meaning as commonly understood by those of ordinary skill in the art to which the present application belongs. The terms used in the specification of the present application are intended only to describe particular embodiments and are not intended to limit the present application.

[0031] Referring to FIG. 1 and FIG. 2, an implementation of the present application provides a heat generating assembly 10. The heat generating assembly 10 includes a mounting seat 101 and a heat generating body 100 mounted on the mounting seat 101.

[0032] Specifically, referring to FIG. 3 and FIG. 4, the heat generating body 100 includes a base body 110 and a heat generating circuit 130 and a temperature measuring circuit 150 that are arranged on the base body 110. The heat generating circuit 130 and the temperature measuring circuit 150 are independent of each other.

[0033] The base body 110 is configured to provide support for the heat generating circuit 130 and the temperature measuring circuit 150. The base body 110 has a bottom surface 115. The base body 110 includes a body 111 and an insulating layer 113. The heat generating circuit 130 and the temperature measuring circuit 150 are located on the insulating layer 113. The body 111 includes a base part 111a and a tip part 111b connected to the base part 111a. The base part 111a is in a shape of a column, the tip part 111b extends in a direction away from the base part 111a, and the width of the cross section of the tip part 111b gradually decreases in a direction away from the base part 111a. The base part 111a serves as a support for the insulating layer 113. The arrangement of the tip part 111b facilitates insertion of the heat generating body 100 into a to-be-heated object (e.g., tobacco). In an optional specific example, the base part 111a is in a shape of a cylinder, a triangular prism, or a quadrangular prism. Certainly, in some other embodiments, the base part 111a is not limited to the above shapes, which may also be in other shapes. In the embodiment shown in FIG. 3, a longitudinal section of the base part 111a is in a shape of a rectangle, and a longitudinal section of the tip part 111b is in a shape of an isosceles triangle. Certainly, in other embodiments, the longitudinal section of the tip part 111b is not limited to the shape of the isosceles triangle, which may also be in a shape of another triangle.

[0034] In some embodiments, the base part 111a has a hollow structure. The base part 111a having the hollow structure can reduce a weight of the heat generating body 100. Meanwhile transfer of heat to an electrode arrangement area 117 can be reduced, and the utilization rate of the heat can be increased.

[0035] In some embodiments, a region of the base part 111a away from the tip part 111b is provided with a blind hole. Further, the blind hole is close to the mounting seat 101. The arrangement of the blind hole on the base part 111a close to the mounting seat 101 can also reduce transfer of the heat to the mounting seat 101, increase the utilization rate of the heat, and prolong the service life of the mounting seat 101 and other components in the mounting seat 101.

[0036] Specifically, the body 111 is a ceramic body 111, for example, a zirconia ceramic body 111, an alumina ceramic body 111, or the like. Further, the base part 111a is a ceramic base part 111a, and the tip part 111b is a ceramic tip part 111b. Certainly, in some other embodiments, the material of the base part 111a is not limited to ceramic, which may also be other materials, such as stainless steel. The material of the tip part 111b is not limited to ceramic, either, which may also be other materials, such as stainless steel.

[0037] The insulating layer 113 is wound on the base part 111a. The insulating layer 113 provides support for the heat generating circuit 130 and the temperature measuring circuit 150, and it also has an insulation effect. Specifically, the insulating layer 113 is wound on an outer surface of the body 111. In the embodiment shown in FIG. 3, the insulating layer 113 is wound on an outer surface of the base part 111a. In some embodiments, firstly, the heat generating circuit 130 and the temperature measuring circuit 150 are prepared on the insulating layer 113 by silk screen printing. Then, the insulating layer 113 is wound (e.g., tape-cast) on the base part 111a and sintered together with the base part. This operation can improve the efficiency of preparation of the heat generating circuit 130 and the temperature measuring circuit 150 on the columnar base part 111a, and prevent the problem that it is difficult to operate the columnar body 111 due to small sizes of the heat generating circuit 130 and the temperature measuring circuit 150.

[0038] Specifically, the insulating layer 113 is a glass ceramic insulating layer 113 or a low-temperature ceramic insulating layer 113. The glass ceramic insulating layer 113 is made of microcrystalline glass. The low-temperature ceramic insulating layer 113 is made of low-temperature ceramic. In an optional specific example, the insulating layer 113 is a glass ceramic insulating layer 113, and the insulating layer 113 is filled with calcium borosilicate glass-silicon oxide. In another optional specific example, the insulating layer 113 is a barium tin borate ceramic insulating layer 113 or a barium zirconate borate ceramic insulating layer 113, and the insulating layer 113 is made of barium tin borate ceramic or barium zirconate borate ceramic. Certainly, it may be understood that the material of the insulating layer 113 is not limited to the above, which may also be other materials that can serve as the insulating layer 113 and can be wound on the body 111. Herein, the low-temperature ceramic is ceramic at sintering temperatures below 1000 °C. Further, the material of the base part 111a is different from that of the insulating layer 113. For example, a material with higher ductility than the base part 111a is selected for the insulating layer 113, and a material with higher hardness than the insulating layer 113 is selected for the base part 111a.

[0039] In this implementation, the insulating layer 113 has a thickness ranging from 0.02 mm to 0.5 mm. Optionally, the thickness of the insulating layer 113 is 0.02 mm, 0.05 mm, 0.1 mm, 0.2 mm, 0.3 mm, 0.4 mm or 0.5 mm.

[0040] It may be understood that, in some embodiments, the insulating layer 113 may be omitted, provided that the body 111 is made of an insulating material when the insulating layer 113 is omitted.

[0041] Referring to FIG. 3 or FIG. 4, the base body 110 is columnar, the base body 110 is provided with a heat generating area 119 and an electrode arrangement area 117 adjacent to the heat generating area 119, the electrode arrangement area 117 and the heat generating area 119 are arranged in a length direction of the base body 110, and the electrode arrangement area 117 is closer to the bottom surface 115 than the heat generating area 119. The heat generating area 119 is a heat generating region of the heat generating body 100, and the heat generating circuit 130 is located in the heat generating area 119. The electrode arrangement area 117 is a region where the heat generating body 100 is mounted on the mounting seat 101. Further, the heat generating area 119 includes a high-temperature area 119a. The high-temperature area 119a is a region where the heat generating body 100 is operating at a relatively high temperature. In one embodiment, the high-temperature area 119a is spaced from the electrode arrangement area 117. In another embodiment, the high-temperature area 119a is adjacent to the electrode arrangement area 117.

[0042] Specifically, for the heat generating body 100 with the base body 110 in a shape of a column or a strip sheet, the ratio of the length (a in FIG. 3) of the high-temperature area 119a in the length direction of the base body 110 to the sum (b in FIG. 3) of the lengths of the heat generating area 119 and the electrode arrangement area 117 in the length direction of the base body 110 is 1: (2 to 5). Further, the ratio of the length of the high-temperature area 119a in the length direction of the base body 110 to the length (c in FIG. 3) of the heat generating area 119 in the length direction of the base body 110 is 1: (1.5 to 4). In the embodiment shown in FIG. 3, the ratio of the length of the high-temperature area 119a in the length direction of the base body 110 to the sum of the lengths of the heat generating area 119 and the electrode arrangement area 117 in the length direction of the base body 110 is 1:3. The ratio of the length of the high-temperature area 119a in the length direction of the base body 110 to the length of the heat generating area 119 in the length direction of the base body 110 is 1:2.

[0043] Referring to FIG. 3, the heat generating circuit 130 is attached to the insulating layer 113. The heat generating circuit 130 is a heat producing part of the heat generating body 100. The heat generating circuit 130 includes a heat generating part 131 and a heat generating electrode 133 electrically connected to the heat generating part 131. The heat generating electrode 133 is a component configured to connect the heat generating part 131 with a power supply. The heat generating part 131 is attached to a surface on one side of the insulating layer 113 away from the body 111. The heat generating part 131 forms the heat generating area 119 on the insulating layer 113. The heat generating electrode 133 is also attached to the surface of the insulating layer 113. The heat generating electrode 133 includes a first electrode 133a and a second electrode 133b. The first electrode 133a and the second electrode 133b are also located on a surface of the base body 110 and close to the mounting seat 101. The first electrode 133a is electrically connected to an end of the heat generating part 131, and the second electrode 133b is electrically connected to another end of the heat generating part 131. Certainly, the first electrode 133a and the second electrode 133b are arranged spaced apart to connect two electrodes (anode and cathode) of the power supply respectively. In other implementations, the heat generating circuit 130 and the temperature measuring circuit 150 are arranged on a same surface of the insulating layer 113, and the heat generating circuit 130 and the temperature measuring circuit 150 are attached to the outer surface of the base part 111a.

[0044] Specifically, the heat generating part 131 includes a heat generating wire 131a. The heat generating wire 131a has one end electrically connected to the first electrode 133a and another end connected to the second electrode 133b. Further, the heat generating wire 131a is connected to the first electrode 133a and the second electrode 133b by silk screen printing. In an optional specific example, the heat generating part 131 includes a U-shaped heat generating wire 131a. The heat generating wire 131a is attached to a surface of the insulating layer 113 away from the body 111. The heat generating wire 131a has one end electrically connected to the first electrode 133a and another end connected to the second electrode 133b. In the embodiment shown in FIG. 3, the heat generating part 131 is two heat generating wires 131a spaced on the insulating layer 113. The two heat generating wires 131a are both U-shaped. One of the heat generating wires 131a is located on an inner side of the other of the heat generating wires 131a. The first electrode 133a and the second electrode 133b are both U-shaped. Two ends of the first electrode 133a are electrically connected to an end of the two heat generating wires 131a respectively. Two ends of the second electrode 133b are electrically connected to another end of the two heat generating wires 131a respectively. It may be understood that, in other embodiments, the number of the heat generating wire 131a is not limited to the above, which may also be other numbers. When a plurality of heat generating wires 131a are provided, the plurality of heat generating wires 131a are spaced, and each heat generating wire has one end electrically connected to the first electrode 133a and another end connected to the second electrode 133b. Certainly, the heat generating wire 131a is not limited to the U shape, which may also be in other shapes, such as a V shape, an S shape, and the like. The first electrode 133a and the second electrode 133b are not limited to the U shape, which may also be in a strip shape or an L shape.

[0045] In one embodiment, the heat generating area 119 includes a high-temperature area 119a and a non-high-temperature area. The width of the heat generating wire 131a in the high-temperature area 119a is less than that of the heat generating wire 131a in the non-high-temperature area. The base body 110 is in a shape of a column or a strip sheet. The length of the high-temperature area 119a is the length of the heat generating wire 131a with a relatively small width in the length direction of the base body 110. The width of the high-temperature area 119a is the width of the base body 110.

[0046] Specifically, the heat generating wire 131a includes an electrode section, a middle section, and a top section connected successively. The electrode section is close to the heat generating electrode 133, and the top section is close to the temperature measuring part 151. In an optional specific example, the width of the middle section is less than each of the widths of the electrode section and the top section (the width of the middle section is minimum). The width of the middle section of the heat generating wire 131a is set to less than the each of the widths of the electrode section and the top section, so that the heat generated by the heat generating body 100 is more concentrated in the middle section and diffuses to the top section and the electrode section, which is in line with smoke taste during the heating, and a region close to the heat generating electrode 133 is at a relatively low temperature, preventing influence on or damage to the mounting seat due to a high temperature. That is, when the width of the middle section of the heat generating wire 131a is less than the each of the widths of the electrode section and the top section, the high-temperature area 119a is a region where the middle section is located. The length of the high-temperature area 119a is the length of the middle section in the length direction of the base body 110, and the width of the high-temperature area 119a is the width of the base body 110. In this case, the high-temperature area 119a is spaced from the electrode arrangement area 117.

[0047] In another optional specific example, the width of the top section of the heat generating wire 131a is less than the widths of the electrode section and the middle section, so that the heat generated by the heat generating body 100 is concentrated in the top section. The high-temperature area 119a is a region where the top section is located. The length of the high-temperature area 119a is the length of the top section in the length direction of the base body 110, and the width of the high-temperature area 119a is the width of the base body 110. In this case, the high-temperature area 119a is spaced from the electrode arrangement area 117.

[0048] In another optional specific example, the width of the electrode section of the heat generating wire 131a is less than each of the widths of the middle section and the top section, so that the heat generated by the heat generating body 100 is concentrated in the electrode section. The high-temperature area 119a is a region where the electrode section is located. The length of the high-temperature area 119a is the length of the electrode section in the length direction of the base body 110, and the width of the high-temperature area 119a is the width of the base body 110. In this case, the high-temperature area 119a is adjacent to the electrode arrangement area 117.

[0049] Specifically, the heat generating part 131 is prepared from a high-resistivity resistance paste. Specifically, the heat generating wire 131a is prepared from the high-resistivity resistance paste. The heat generating part 131 may be formed by transferring the high-resistivity resistance paste onto the insulating layer 113 by silk-screen printing a thick-film paste, and then sintering. Specifically, the high-resistivity resistance paste for preparing the heat generating part 131 includes at least one of Ni, Ag, Pd, Pt and Ru. Further, the resistance paste for preparing the heat generating part 131 includes Ni, an AgPd alloy, an AgPt alloy or an Ag-Ru alloy. Certainly, the high-resistivity resistance paste for preparing the heat generating part 131 further includes a binder, for example, an inorganic binder. It may be understood that the binder accounts for a small proportion in the high-resistivity resistance paste. Certainly, the preparation method for the heat generating part 131 is not limited thereto, which may also be other common methods in the art.

[0050] In one embodiment, the sheet resistance of the heat generating part 131 ranges from 20 mΩ/□ to 200 mΩ/□. Further, the sheet resistance of the heat generating part 131 is 20 mΩ/□, 50 mΩ/□, 80 mΩ/□, 100 mΩ/□, 120 mΩ/□, 150 mΩ/□, 180 mΩ/□, or 200 mΩ/□.

[0051] In one embodiment, at room temperature, the resistance of the heat generating part 131 ranges from 0.5 Ω to 2 Ω. Further, at the room temperature, the resistance of the heat generating part 131 ranges from 1 Ω to 2 Ω. Certainly, in other embodiments, the resistance of the heat generating part 131 at the room temperature is not limited to the above. The resistance of the heat generating part 131 may be set by adjusting the material of the resistance paste for preparing the heat generating part 131, the length of the heat generating part 131, the width of the heat generating part 131, a thickness of the heat generating part 131, and a pattern of the heat generating part 131 as required.

[0052] In one embodiment, the heat generating part 131 is a positive temperature coefficient thermistor. By setting the heat generating part 131 as the positive temperature coefficient thermistor, the heat generating part 131 can be rapidly heated, and after the temperature reaches a certain value, the resistance of the heat generating part 131 rises sharply due to the rise of the temperature, so that almost no current flows through the heat generating part 131 and the heat generating part 131 stops generating heat, thereby preventing the continuous excessively high temperature of the heat generating area 119.

[0053] Specifically, the heat generating electrode 133 is made of a low-resistivity resistance paste. More specifically, the first electrode 133a and the second electrode 133b are made of the low-resistivity resistance paste. Similarly, the heat generating electrode 133 may be formed by transferring the low-resistivity resistance paste onto the insulating layer 113 by silk-screen printing a paste, and then sintering. Specifically, the low-resistivity resistance paste for preparing the heat generating electrode 133 includes at least one of Ag and gold (Au). In an optional specific example, the resistance paste for preparing the heat generating electrode 133 includes Ag, Au, an Au alloy or an Ag alloy. Certainly, the low-resistivity resistance paste for preparing the heat generating electrode 133 further includes a binder, for example, an inorganic binder. It may be understood that the binder accounts for a larger proportion in the low-resistivity resistance paste than in the high-resistivity resistance paste. Certainly, the preparation method for the heat generating electrode 133 is not limited thereto, which may also be other common methods in the art.

[0054] In this implementation, the sheet resistance of the heat generating electrode 133 is no more than 5 mΩ/□. Further, the sheet resistance of the heat generating electrode 133 ranges from 1 mΩ/□ to 5 mΩ/□. The resistance of the heat generating electrode 133 is much less than that of the heat generating part 131. For example, the resistance of the heat generating electrode 133 ranges from 0.1 Ω to 0.5 Ω. In this way, the heat generating electrode 133 produces almost no heat when energized, reducing the temperature of the mounting seat 101 and saving energy consumption.

[0055] Referring to FIG. 3, the temperature measuring circuit 150 is configured to feed back a temperature of the heat generating body 100. The temperature measuring circuit 150 is attached to a surface on one side of the insulating layer 113 away from the body 111. The temperature measuring circuit 150 and the heat generating circuit 130 are arranged spaced apart, so that the heat generating circuit 130 and the temperature measuring circuit 150 are independent of each other. When the heat generating circuit 130 and the temperature measuring circuit 150 are arranged independently of each other, the temperature measuring circuit 150 has less spontaneous heat and fewer miscellaneous signals introduced by current heating, which is conducive to accurate control of electronic components over the temperature.

[0056] Specifically, the temperature measuring circuit 150 includes a temperature measuring part 151 and a temperature measuring electrode 153 electrically connected to the temperature measuring part 151. The temperature measuring part 151 is a part of the temperature measuring circuit 150 configured for temperature measurement. The temperature measuring part 151 is within the high-temperature area 119a. The temperature measuring electrode 153 is a component configured to connect the temperature measuring part 151 with the power supply. The temperature measuring electrode 153 is attached to the insulating layer 113. When the high-temperature area 119a is spaced from the electrode arrangement area 117, the temperature measuring electrode 153 extends from the heat generating area 119 into the electrode arrangement area 117. When the high-temperature area 119a is adjacent to the electrode arrangement area 117, the temperature measuring electrode 153 is entirely located in the electrode arrangement area 117. In an optional specific example, an end of the temperature measuring electrode 153 close to the temperature measuring part 151 is flush with an end of the heat generating electrode 133 close to the heat generating part 131. The temperature measuring part 151 has resistance TCR characteristics. That is, a specific correspondence exists between temperatures and resistance. When a voltage is applied to the temperature measuring part 151 through the power supply and an electronic control device, a specific current value is obtained, so as to obtain a resistance value of the temperature measuring part 151, and then the temperature of the heat generating body 100 is obtained through the resistance value measured. More specifically, the temperature measuring electrode 153 includes a third electrode 153a and a fourth electrode 153b. The third electrode 153a and the fourth electrode 153b extend from the heat generating area 119a to the electrode arrangement area 117. An end of the temperature measuring part 151 is electrically connected to the third electrode 153a, and another end of the temperature measuring part 151 is electrically connected to the fourth electrode 153b. In an optional specific example, the temperature measuring part 151 is connected to the third electrode 153a and the fourth electrode 153b by soldering.

[0057] On the heat generating body 100, the temperature of the heat generating body 100 generally decreases from the heat generating area 119 to the electrode arrangement area 117 gradually, mainly because airflow flows from the electrode arrangement area 117 to the heat generating area 119 when a user smokes. That is, the electrode arrangement area 117 is cooled first. On the other hand, due to the characteristics of heat conduction, the heat at a relatively high position may be slightly more than that at a low position. The temperature of the heat generating area 119 away from the electrode arrangement area 117 is often higher than that of the heat generating area 119 close to the electrode arrangement area 117. Therefore, the arrangement of the temperature measuring part 151 in the heat generating area 119 away from the electrode arrangement area 117 can more accurately reflect the temperature of the heat generating body 100, so as to facilitate more accurate control over a temperature in an initial heating stage, so that the deviation between the temperature in the initial heating stage and a planned temperature is smaller. Further, the temperature measuring part 151 is located in the high-temperature area 119a. When the temperature measuring part 151 is located in the high-temperature area 119a, a maximum temperature of the heat generating body 100 can be more accurately reflected, it is easier to control a voltage of a heat generation circuit of the heat generating body 100, and heat generated by the heat generating circuit 130 is reduced. Therefore, the deviation between an actual temperature in the initial heating stage and a planned temperature is smaller, improving consistency between the actual temperature in the initial heating stage and the planned temperature.

[0058] More specifically, the temperature measuring part 151 includes a temperature measuring wire. In an embodiment in which the heat generating part 131 is a U-shaped heat generating wire 131a, the temperature measuring part 151 is a temperature measuring wire. The temperature measuring wire is away from the connection point between the heat generating wire 131a and the first electrode 133a, the second electrode 133b (i.e., an opening formed by two ends of the U-shaped heat generating wire 131a) and close to the bottom of the U-shaped heat generating wire 131a, and the temperature measuring wire is on an inner side of the U-shaped heat generating wire 131a. In an embodiment in which the heat generating part 131 is provided with a plurality of heat generating wires 131a, one or more temperature measuring wires may be provided. Optionally, when one temperature measuring wire is provided, the temperature measuring wire is arranged in a high-temperature area 119a formed by the plurality of heat generating wires 131a. When a plurality of temperature measuring wires are provided, the temperature measuring wires are arranged spaced apart in the high-temperature area 119a formed by the plurality of heat generating wires 131a.

[0059] In the embodiment shown in FIG. 3, the temperature measuring wire is also U-shaped. The high-temperature area 119a formed by the heat generating wires 131a is the heat generating area 119 whose distance to the bottom surface 115 of the base body 110 is greater than 2/3 of the length of the base body. In the high-temperature area 119a, the temperature measuring wire is located between two U-shaped heat generating wires 131a, and the temperature measuring wire is spaced from the two U-shaped heat generating wires 131a. The third electrode 153a and the fourth electrode 153b on the surface on the side of the insulating layer 113 away from the body 111 are strip-shaped. Part of the third electrode 153a is located on an inner side of the first electrode 133a, and part of the fourth electrode 153b is located on an inner side of the second electrode 133b.

[0060] Certainly, in other embodiments, the temperature measuring wire is not limited to the U shape, which may also be in other shapes, such as a V shape, an S shape, and the like. The third electrode 153a and the fourth electrode 153b are not limited to the strip shape, which may also be in other shapes, such as an L shape.

[0061] Specifically, the temperature measuring part 151 is prepared from a high-resistivity resistance paste. More specifically, the temperature measuring wire may also be prepared from the high-resistivity resistance paste. The temperature measuring part 151 may be formed by transferring the high-resistivity resistance paste onto the insulating layer 113 by silk-screen printing a thick-film paste, and then sintering. In this implementation, the high-resistivity resistance paste for preparing the temperature measuring part 151 includes at least one of Ni, Ag, Pd, Pt, and Ru. Further, the resistance paste for preparing the temperature measuring part 151 includes Ni, an AgPd alloy, an AgPt alloy or an Ag-Ru alloy. Certainly, the high-resistivity resistance paste for preparing the temperature measuring part 151 further includes a binder, for example, an inorganic binder. It may be understood that the binder accounts for a small proportion in the high-resistivity resistance paste. Certainly, the preparation method for the temperature measuring part 151 is not limited thereto, which may also be other common methods in the art.

[0062] In one embodiment, the sheet resistance of the temperature measuring part 151 ranges from 20 mΩ/□ to 200 mΩ/□. Further, the sheet resistance of the temperature measuring part 151 is 20 mΩ/□, 50 mΩ/□, 80 mΩ/□, 100 mΩ/□, 120 mΩ/□, 150 mΩ/□, 180 mΩ/□, or 200 mΩ/□.

[0063] Since the temperature measuring part 151 does not generate heat, initial resistance thereof is generally larger than the resistance of the temperature measuring part 151. In one embodiment, at room temperature, the resistance of the temperature measuring part 151 ranges from 1.5 Ω to 20 Ω. Further, at the room temperature, the resistance of the temperature measuring part 151 ranges from 10 Ω to 20 Ω. Certainly, in other embodiments, the resistance of the temperature measuring part 151 at the room temperature is not limited to the above. The resistance of the temperature measuring part 151 may be set by adjusting the material of the resistance paste for preparing the temperature measuring part 151, the length of the temperature measuring part 151, the width of the temperature measuring part 151, a thickness of the temperature measuring part 151, and a pattern of the temperature measuring part 151 as required.

[0064] In one embodiment, the temperature measuring part 151 is a positive temperature coefficient thermistor. By providing the temperature measuring part 151 as the positive temperature coefficient thermistor, the resistance value varies with temperature over a larger span, and a temperature of a surrounding environment can be more accurately reflected. Further, the resistance temperature coefficient of the heat generating part 131 is less than that of the temperature measuring part 151. The resistance temperature coefficient of the heat generating part 131 being less than that of the temperature measuring part 151 enables heat generating and temperature measuring functions to be separated, and the heat generating circuit 130 has relatively low energy consumption and low costs. In an optional specific example, the material of the heat generating part 131 is selected from at least one of a nickel-chromium alloy, a tantalum alloy, a gold-chromium alloy and a nickel-phosphorus alloy. By use of the above materials, the resistance temperature coefficient of the heat generating part 131 can be relatively low. In this case, the resistance value of the heat generating part 131 varies slightly with temperature, the resistance value is stable and reliable, and the heat generation is stable. The material of the temperature measuring part 151 is selected from at least one of copper (Cu), Ni, manganese (Mn), and Ru. Further, the material of the temperature measuring part 151 is selected from one of Cu, Ni, Mn, and Ru. According to the TCR characteristics, internal resistance of the temperature measuring part 151 increases as the temperature increases. The larger the resistance temperature coefficient of the temperature measuring part 151 is, the more obvious the internal resistance increases. A current in a temperature measuring circuit is more easily measured by a current sensor when changing more, and a measurement result is more accurate.

[0065] Specifically, the temperature measuring electrode 153 is also made of a low-resistivity resistance paste. More specifically, the third electrode 153a and the fourth electrode 153b are also made of low-resistivity resistance pastes. The temperature measuring electrode 153 may be formed by transferring the low-resistivity resistance paste onto the insulating layer 113 by silk-screen printing a paste, and then sintering. Specifically, the low-resistivity resistance paste for preparing the temperature measuring electrode 153 includes at least one of Ag and Au. In an optional specific example, the resistance paste for preparing the temperature measuring electrode 153 includes Ag, Au, an Au alloy or an Ag alloy. Certainly, the low-resistivity resistance paste for preparing the temperature measuring electrode 153 further includes a binder, for example, an inorganic binder. It may be understood that the binder accounts for a larger proportion in the low-resistivity resistance paste than in the high-resistivity resistance paste. Certainly, the preparation method for the temperature measuring electrode 153 is not limited thereto, which may also be other common methods in the art.

[0066] In this implementation, the sheet resistance of the temperature measuring electrode 153 is no more than 5 mΩ/□. Further, the sheet resistance of the temperature measuring electrode 153 ranges from 1 mΩ/□ to 5 mΩ/□. Resistance of the temperature measuring electrode 153 is much less than that of the temperature measuring part 151. For example, the resistance of the temperature measuring electrode 153 ranges from 0.1 Ω to 0.5 Ω. In this way, the temperature measuring electrode 153 generates almost no heat when energized, reducing a temperature of the mounting seat 101 and saving energy consumption. Referring to FIG. 2, the temperature measuring electrode 153 is further provided with a lead wire 140. The lead wire 140 on the temperature measuring electrode 153 is configured to electrically connect the power supply with the temperature measuring electrode 153. The heat generating electrode 133 is also provided with a lead wire 140. The lead wire 140 on the heat generating electrode 133 is configured to electrically connect the power supply with the heat generating electrode 133. The lead wire 140 on the temperature measuring electrode 153 and the lead wire 140 on the heat generating electrode 133 are arranged spaced apart.

[0067] Specifically, the heat generating electrode 133 is soldered with a lead wire 140, the temperature measuring electrode 153 is also soldered with a lead wire 140, and a soldering point between the temperature measuring electrode 153 and the lead wire 140 and a soldering point between the heat generating electrode 133 and the lead wire 140 are both located in the mounting seat 101. A plane where the lead wire 140 on the temperature measuring electrode 153 is located is not coplanar with a plane where the lead wire 140 on the heat generating electrode 133 is located. The soldering point between the temperature measuring electrode 153 and the lead wire 140 is closer to the bottom surface 115 of the base body 110 than the soldering point between the heat generating electrode 133 and the lead wire 140. In the embodiment shown in FIG. 2, the lead wire 140 of the temperature measuring electrode 153 and the heat generating electrode 133 are located on different surfaces on the side of the insulating layer 113 away from the body 111. The temperature measuring electrode 153 has one part located on the side of the insulating layer 113 away from the body 111 and the other part located on the side of the insulating layer 113 close to the body 111. The temperature measuring electrode 153 is connected to the lead wire 140 through an electrode located on the side of the insulating layer 113 close to the body 111. In this implementation, two heat generating electrodes 133 are provided, two temperature measuring electrodes 153 are provided, four lead wires are provided, and the two heat generating electrodes 133 and the two temperature measuring electrodes 153 are each connected to one lead wire.

[0068] In some embodiments, the heat generating body 100 further includes a protective layer 170. The protective layer 170 is configured to protect the heat generating part 131, the temperature measuring part 151, and the temperature measuring electrode 153 located in the heat generating area 119. Specifically, the protective layer 170 is located in the heat generating area 119. The protective layer covers the heat generating part 131, the entire temperature measuring part 151, and part of the temperature measuring electrode 153. In this implementation, the protective layer 170 is a glaze layer. When the protective layer 170 is a glaze layer, since the glaze layer has a smooth surface, the protective layer 170 enables the heat generating body 100 to have an effect of resisting adhesion of tobacco oil while protecting components in the heat generating area 119, so that the to-be-heated object can be removed and inserted more smoothly. In other embodiments, the material of the protective layer 170 is not limited to glaze, which may also be other materials.

[0069] In an optional specific example, the protective layer 170 has a thickness ranging from 0.1 mm to 0.5 mm. Certainly, when the thickness of the protective layer 170 is greater than 0.5 mm, it is not conducive to transferring the heat of the heat generating part 131 to the to-be-heated object. When the thickness of the protective layer 170 is less than 0.1 mm, the protective layer 170 may be damaged or easily detached.

[0070] In this implementation, the base part is in a shape of a cylinder, the base part 111a has a diameter ranging from 2 mm to 5 mm, the base part 111a has a length ranging from 15 mm to 25 mm, and the body 111 has a length ranging from 18 mm to 30 mm. The heat generating part 131 has a length ranging from 8 mm to 12 mm in a length direction of the base part 111a, and the heat generating part 131 has a width ranging from 0.5 mm to 1.5 mm. In an optional specific example, the diameter of the base part 111a is 3 mm, the length of the base part 111a is 16 mm, and the length of the body 111 is 20 mm. The length of the heat generating part 131 in the length direction of the base part 111a is 10 mm, and the width of the heat generating part 131 is 0.8 mm. Certainly, in other implementations, dimensions of the body 111, the base part 111a, and the heat generating wire 131a are not limited to the above, which may also be adjusted as required.

[0071] Referring to FIG. 3, a region from one side of the heat generating electrode 133 close to the heat generating part 131 to the bottom surface 115 of the base body 110 is the electrode arrangement area 117. The mounting seat 101 is located in the electrode arrangement area 117. Referring to FIG. 4 to FIG. 7, the mounting seat 101 is fixed to the heat generating body 100, the mounting seat 101 has a hollow structure, the mounting seat 101 is fixedly connected to the base body 110 of the heat generating body 100, and the connection point between the mounting seat 101 and the base body 110 is located on one side of the heat generating electrode 133 close to the bottom surface 115. The connection point between the mounting seat 101 and the base body 110 is arranged on the side of the heat generating electrode 133 close to the bottom surface 115, so that a part of the mounting seat 101 in contact with the base body 110 is away from the heat generating part 131 and closer to the bottom surface 115, thereby reducing the influence of the heat of the heat generating part 131 on the mounting seat 101 and prolonging the service life of the mounting seat 101.

[0072] More specifically, the connection point between the mounting seat 101 and the base body 110 is located between the heat generating electrode 133 and the bottom surface 115, and the connection point between the mounting seat 101 and the base body 110 is spaced from the heat generating electrode 133 and the bottom surface 115. Alternatively, the connection point between the mounting seat 101 and the base body 110 is on one side close to the bottom surface 115 and adjacent to the heat generating electrode 133. Further, the clamping point or abutting point between the mounting seat 101 and the base body 110 is located between the heat generating electrode 133 and the bottom surface 115, and the clamping point or abutting point between the mounting seat 101 and the base body 110 is spaced from the heat generating electrode 133 and the bottom surface 115. Alternatively, the clamping point or abutting point between the mounting seat 101 and the base body 110 is on one side close to the bottom surface 115 and adjacent to the heat generating electrode 133.

[0073] Referring to FIG. 7, the heat generating assembly 10 further includes a clamping member 105. The clamping member 105 is arranged outside the base body 110 and is fixed to the base body 110. The clamping member 105 is located in the mounting seat 101 and clamped with an inner wall of the mounting seat 101. The heat generating body 100 is fixed in the mounting seat 101 through cooperation between the clamping member 105 and the mounting seat 101. In the embodiment shown in FIG. 7, the clamping member 105 is located between the connection point between the heat generating electrode 133 and the lead wire and the connection point between the temperature measuring electrode 153 and the lead wire. Part of the temperature measuring electrode 153 is housed in the mounting seat. Certainly, in other embodiments, the clamping member 105 may be further at another position in the mounting seat 101. For example, the clamping member 105 is located between the temperature measuring electrode 153 and the bottom surface 115. Certainly, the clamping member 105 is provided with a through hole or slot for the lead wire 140 to pass through. Optionally, the clamping member 105 is a flange. In some embodiments, the clamping member 105 is integrally formed with the base body 110 of the heat generating body 100. Certainly, in other embodiments, the clamping member 105 may be omitted. When the clamping member 105 is omitted, the heat generating body 100 may be mounted on the mounting seat 101 by interference fit. Certainly, a contact part between the base body 110 and the mounting seat 101 during the interference fit is located on the side of the heat generating electrode 133 close to the bottom surface.

[0074] Certainly, in other embodiments, the temperature measuring electrode 153 may also be entirely housed in the mounting seat 101. It may be understood that, in some other embodiments, the connection point between the mounting seat 101 and the base body 100 may also be located on the side of the heat generating electrode 133 close to the heat generating part 131 or on the heat generating electrode 133. In this case, the mounting seat 101 is closer to the heat generating part 131, which is easily affected by heat and has a shortened service life.

[0075] Referring to FIG. 4 and FIG. 5, the mounting seat 101 includes a mounting base 101a and a mounting cover 101b. The mounting base 101a and the mounting cover 101b may be movably connected or fixedly connected. Optionally, the mounting base 101a is clamped with the mounting cover 101b. Certainly, through holes are provided on the mounting base 101a and/or the mounting cover 101b for the lead wires 140 to be threaded out. A plurality of lead wire slots is provided in the mounting seat 101a and/or the mounting cover 101b. The lead wires 140 are arranged in different lead wire slots respectively, so that the lead wires 140 are spaced apart. In the embodiment shown in FIG. 5, the heat generating part 131 is not arranged in the mounting seat 101, so that the influence of the heat generating body 100 on the mounting seat 101 is further reduced. Certainly, in some other embodiments, part of the heat generating part 131 may be arranged in the mounting seat 101.

[0076] Referring to FIG. 7, the heat generating assembly 10 further includes a sealing member 103. The sealing member 103 is arranged outside the heat generating body 100. The sealing member 103 is located at the connection point between the heat generating part 131 and the heat generating electrode 133. The sealing member 103 is configured to prevent the influence on the electrode in the mounting seat 101 due to the flowing of a product formed after heating (e.g., atomized liquid generated by heating tobacco or a cartridge) along the surface of the heat generating body 100 into the mounting seat 101. Optionally, the sealing member 103 abuts against the mounting seat 101 and is partially housed in the mounting seat 101. In an optional specific example, the material of the sealing member 103 is silica gel. Certainly, in other embodiments, the sealing member 103 may also be made of other materials.

[0077] Optionally, the sealing member 103 is in loose fit with the heat generating body 100, provided that it is difficult for the atomized liquid generated by heating the tobacco or cartridge to enter the mounting seat 101 through a gap. For example, a gap ranging from 0.5 mm to 2 mm exists between the sealing member 103 and the heat generating body 100. Within the range of the gap, it is difficult for the atomized liquid generated by heating the tobacco or cartridge to enter the mounting seat 101 through the gap. Furthermore, a gap of 1 mm exists between the sealing member 103 and the heat generating body 100. It may be understood that, in some embodiments, the sealing member 103 may be omitted. When the sealing member 103 is omitted, the mounting seat 101 may also be designed with the function of the sealing member 103. For example, an end of the mounting seat 101 close to the connection point between the heat generating electrode 133 and the heat generating part 131 may be designed to prevent the flowing of the product formed after heating into the mounting seat 101. Certainly, a protection member may also be arranged in the mounting seat 101 to protect the electrode.

[0078] Referring to FIG. 8 to FIG. 12, the present application further provides a heat generating assembly 20 according to another implementation. The heat generating assembly 20 has a structure roughly the same as that of the heat generating assembly 10. The heat generating assembly 20 includes a mounting seat 201, a heat generating body 200 mounted on the mounting seat 201, and a sealing member 203. The sealing member 203 is arranged outside the heat generating body 200 and is close to the mounting seat 201. The heat generating body 200 includes a base body 210 and a heat generating circuit 230 and a temperature measuring circuit 250 that are arranged on the base body 210 and independent of each other. The heat generating circuit 230 includes a heat generating part 231 and a heat generating electrode 233. The heat generating part 231 forms a heat generating area on the base body 210. The heat generating electrode 233 includes a first electrode 233a and a second electrode 233b. The temperature measuring circuit 250 includes a temperature measuring part 251 and a temperature measuring electrode 253. The temperature measuring part 251 is located in the heat generating area away from the mounting seat 201. The temperature measuring electrode 253 extends from the heat generating area into the mounting seat 201. The temperature measuring electrode 253 includes a third electrode 253a and a fourth electrode 253b. The heat generating assembly 20 is different from the heat generating assembly 10 in that, in the heat generating assembly 20,

[0079] The base body 210 is in a shape of a strip sheet. Specifically, the body 211 is in a shape of a strip sheet, and the body 211 is provided with a first protrusion 211c and a second protrusion 211d. The first protrusion 211c and the second protrusion 211d are arranged spaced apart. The first protrusion 211c is close to the heat generating electrode 233. The second protrusion 211d is close to a bottom surface of the base body 210. A chute 201c is arranged on a mounting base 201a of the mounting seat 201. A slider 201d is arranged on a mounting cover 201b. The mounting base 201a and the mounting cover 201b are movably connected through cooperation between the chute 201c and the slider 201d. The mounting base 201a is further provided with a clamping slot 201f. The clamping slot 201f is located on one side of the heat generating electrode 233 close to the bottom surface of the base body 210. The second protrusion 211d is clamped in the clamping slot 201f, so that the mounting seat 201 is fixedly connected to the base body 110. Further, a guide protrusion is further formed on the mounting seat 201a to facilitate the mounting of the heat generating body 200. An upper surface and a lower surface of the body 211 are each provided with an insulating layer 213, and the insulating layer 213 close to the lower surface of the body 211 is further provided with a protective layer 270. The heat generating electrode 233 is coplanar with the temperature measuring electrode 253.

[0080] In an implementation, the present application further provides a heating device. The heating device includes any one of the above heat generating assemblies.

Specific embodiments

[0081] Detailed descriptions are given below in conjunction with specific embodiments. The following embodiments do not include components other than unavoidable impurities unless otherwise specified. The use of reagents and instruments in the embodiments is a routine choice in the art unless otherwise specified. Experimental methods that do not specify specific conditions in the embodiments shall be implemented in accordance with conventional conditions, such as conditions described in literature, books, or methods recommended by manufacturers.

Embodiment 1

[0082] A structure of a heat generating assembly according to Embodiment 1 is shown in FIG. 1. A base part of a heat generating body is made of zirconia ceramic and has a diameter of 3 mm. The base part has a length of 16 mm. An insulating layer wound on the base part has a thickness of 0.3 mm. A heat generating wire has a length of 10 mm in a length direction of the base part. The heat generating wire has a width of 0.8 mm. A maximum length of the heat generating wire formed in a width direction of the base part is 5.06 mm. A temperature measuring wire has a length of 4 mm in the length direction of the base part. Distances between the temperature measuring wire and two heat generating wires are equal. The resistance of a heat generating part is 1 Q at room temperature. The sheet resistance of the heat generating part is 100 mΩ/□. The heat generating part is mainly made of Ni. The resistance of a temperature measuring part is 10 Ω at room temperature. The sheet resistance of the temperature measuring part is 150 mΩ/□. The temperature measuring part is mainly made of AgPb. A temperature measuring electrode and a heat generating electrode are both electrodes made of silver pastes.

[0083] Thermostatic stability of the heat generating assembly according to Embodiment 1 in an initial stage is tested by infrared temperature measurement, and results are shown in FIG. 13. In FIG. 13, the abscissa is time, the length of each square in a horizontal direction represents 15 s, and the ordinate is temperature (°C). As can be seen from FIG. 13, the temperature measuring part of the heat generating body in Embodiment 1 can accurately reflect a real-time temperature of the heat generating body. The heat generating body shows a small upsurge in the highest temperature up to 345 °C, then gradually stabilizes at a temperature of 340 °C, which shows a high temperature overshoot of only about 5 °C, and then quickly reaches a stable temperature. As can be seen, the temperature measuring part is arranged in the heat generating area away from the electrode arrangement area as described above, which can well alleviate the problem that it is difficult to control the temperature in the initial stage of the heat generating body to be consistent.

Comparative Example 1

[0084] A structure of a heat generating assembly according to Comparative Example 1 is roughly the same as that in Embodiment 1, except that, as shown in FIG. 14, a temperature measuring part 351 in Comparative Example 1 is arranged in an entire heat generating area 319, and the sheet resistance of the temperature measuring part 351 in Comparative Example 1 is the same as that in Embodiment 1.

[0085] Thermostatic stability of the heat generating assembly according to Comparative Example 1 in an initial stage is shown in FIG. 15. In FIG. 15, the abscissa is time, the length of each square in a horizontal direction represents 15 s, and the ordinate is temperature (°C). As can be seen from FIG. 15, when the heat generating body in Comparative Example 1 is controlled at a constant temperature, since the temperature measuring part 351 cannot reflect the real-time temperature of the heat generating body, the heat generating body shows a large upsurge in the highest temperature up to 362 °C, and then gradually reaches a stable temperature of 338 °C, which shows a high temperature overshoot of about 24 °C. Moreover, the temperature overshoot may vary greatly as the heat generating body varies, which may make it more difficult to control the temperature of the heat generating body in the initial stage to be consistent during batch production.

[0086] The technical features in the above embodiments may be randomly combined. For concise description, not all possible combinations of the technical features in the above embodiments are described. However, all the combinations of the technical features are to be considered as falling within the scope described in this specification provided that they do not conflict with each other.

[0087] The above embodiments only describe several implementations of the present application, and their description is specific and detailed, but cannot therefore be understood as a limitation on the scope of the application. It should be noted that those of ordinary skill in the art may further make variations and improvements without departing from the conception of the present application, all of which fall within the protection scope of the present application. Therefore, the protection scope of the present application should be subject to the appended claims.

Claims

1. A heat generating body comprising:

a base body having a bottom surface, the base body being provided with a heat generating area and an electrode arrangement area adjacent to the heat generating area, the electrode arrangement area being closer to the bottom surface than the heat generating area;

a heat generating circuit arranged on the base body, the heat generating circuit comprising a heat generating part and a heat generating electrode electrically connected to the heat generating part, the heat generating part being arranged in the heat generating area, the heat generating electrode being arranged in the electrode arrangement area; and

a temperature measuring circuit arranged on the base body, the temperature measuring circuit and the heat generating circuit being arranged spaced apart, the temperature measuring circuit comprising a temperature measuring part and a temperature measuring electrode electrically connected to the temperature measuring part, the heat generating area comprising a high-temperature area, the temperature measuring part being arranged in the high-temperature area.

2. The heat generating body according to claim 1, wherein the high-temperature area and the electrode arrangement area are arranged spaced apart, and the temperature measuring electrode extends from the heat generating area to the electrode arrangement area; or the high-temperature area is arranged adjacent to the electrode arrangement area, and the temperature measuring electrode is entirely arranged in the electrode arrangement area.

3. The heat generating body according to claim 2, wherein the base body is in a shape of a column or a strip sheet, the electrode arrangement area and the heat generating area are arranged in a length direction of the base body, and the ratio of the length of the high-temperature area in the length direction of the base body to the sum of lengths of the heat generating area and the electrode arrangement area in the length direction of the base body is 1: (2 to 5).

4. The heat generating body according to claim 3, wherein the ratio of the length of the high-temperature area in the length direction of the base body to the length of the heat generating area in the length direction of the base body is 1: (1.5 to 4).

5. The heat generating body according to any one of claims 1 to 4, wherein the heat generating electrode comprises a first electrode and a second electrode spaced from the first electrode, and the temperature measuring electrode comprises a third electrode and a fourth electrode spaced from the third electrode, the first electrode, the second electrode, the third electrode and the fourth electrode being all connected to lead wires, and the lead wires being spaced from one another.

6. The heat generating body according to claim 5, wherein the heat generating part is U-shaped, an end of the heat generating part is electrically connected to the first electrode, another end of the heat generating part is electrically connected to the second electrode, the temperature measuring part is close to a U-shaped bottom of the heat generating part, and the temperature measuring part is away from an opening formed by the two ends of the heat generating part; and/or
the temperature measuring part is U-shaped, an end of the temperature measuring part is electrically connected to the third electrode, and another end of the temperature measuring part is electrically connected to the fourth electrode.

7. The heat generating body according to claim 5, wherein the heat generating part comprises a plurality of heat generating wires arranged spaced apart, an end of each of the heat generating wires being electrically connected to the first electrode, and another end of each of the heat generating wires being electrically connected to the second electrode, and the temperature measuring part is located in a space between U-shaped bottoms of the adjacent heat generating wires and is spaced from the heat generating wires.

8. The heat generating body according to claim 7, wherein the heat generating part comprises two heat generating wires arranged spaced apart, and the first electrode and the second electrode are both U-shaped; and
wherein part of the third electrode is located on an inner side of the first electrode, and part of the fourth electrode is located on an inner side of the second electrode.

9. The heat generating body according to any one of claims 1 to 4 and 6 to 8, wherein the heat generating part comprises a heat generating wire, and the heat generating area comprises a high-temperature area and a non-high-temperature area, the heat generating wire being arranged in both the high-temperature area and the non-high-temperature area, and
wherein the width of the heat generating wire in the high-temperature area is less than the width of the heat generating wire in the non-high-temperature area.

10. The heat generating body according to claim 9, wherein the heat generating wire comprises an electrode section, a middle section, and a top section connected successively, the electrode section being close to the heat generating electrode, the top section being close to the temperature measuring part, each of the widths of the electrode section and the top section being greater than the width of the middle section.

11. The heat generating body according to claim 1, wherein the base body is in a shape of a column or a strip sheet; and
wherein the base body comprises a body and an insulating layer located on the body, the body comprising a base part and a tip part connected to the base part, the tip part extending in a direction away from the base part, the width of the cross section of the tip part gradually decreasing in a direction away from the base part, the insulating layer being wound on the base part, and the heat generating circuit and the temperature measuring circuit are located on the insulating layer.

12. The heat generating body according to claim 11, wherein the base part is a ceramic base part or a stainless steel base part, and the insulating layer is a glass ceramic insulating layer or a low-temperature ceramic insulating layer; and/or
wherein the insulating layer has a thickness ranging from 0.02 mm to 0.5 mm.

13. The heat generating body according to any one of claims 1 to 4, 6 to 8 and 10 to 12, wherein, at room temperature, the resistance of the heat generating part ranges from 0.5 Q to 2 Q; and/or
wherein at the room temperature, the resistance of the temperature measuring part ranges from 1.5 Ω to 20 Ω.

14. The heat generating body according to any one of claims 1 to 4, 6 to 8 and 10 to 12, wherein the heat generating part is a positive temperature coefficient thermistor; and/or

wherein the temperature measuring part is a

positive temperature coefficient thermistor; and/or
wherein the sheet resistance of the heat generating part ranges from 20 mΩ/□ to 200 mΩ/□; and/or
wherein the sheet resistance of the temperature measuring part ranges from 20 mΩ/□ to 200 mΩ/□; and/or
the heat generating part comprises at least one of nickel (Ni), silver (Ag), palladium (Pd), platinum (Pt) and ruthenium (Ru); and/or
the temperature measuring part comprises at least one of Ni, Ag, Pd, Pt and Ru.

15. The heat generating body according to claim 14, wherein the resistance temperature coefficient of the heat generating part is less than that of the temperature measuring part.

16. The heat generating body according to claim 15, wherein the material of the heat generating part is selected from at least one of a nickel-chromium alloy, a tantalum alloy, a gold-chromium alloy and a nickel-phosphorus alloy; and/or
wherein the material of the temperature measuring part is selected from at least one of copper (Cu), Ni, manganese (Mn) and Ru.

17. The heat generating body according to any one of claims 1 to 4, 6 to 8, 10 to 12 and 15 to 16, wherein the sheet resistance of the heat generating part is no more than 5 mΩ/□, and the sheet resistance of the temperature measuring part is no more than 5 mΩ/□.

18. The heat generating body according to claim 17, wherein the heat generating body further comprises a protective layer, the protective layer covering the heat generating part, the temperature measuring part and part of the temperature measuring electrode.

19. A heat generating assembly, comprising a mounting seat and a heat generating body mounted on the mounting seat, the heat generating body being the heat generating body according to any one of claims 1 to 18.

20. A heating device, comprising a housing and the heat generating assembly according to claim 19.

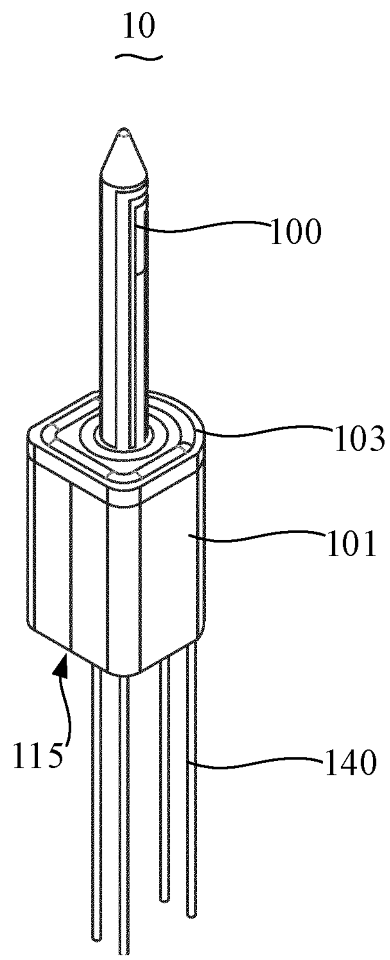


FIG. 1

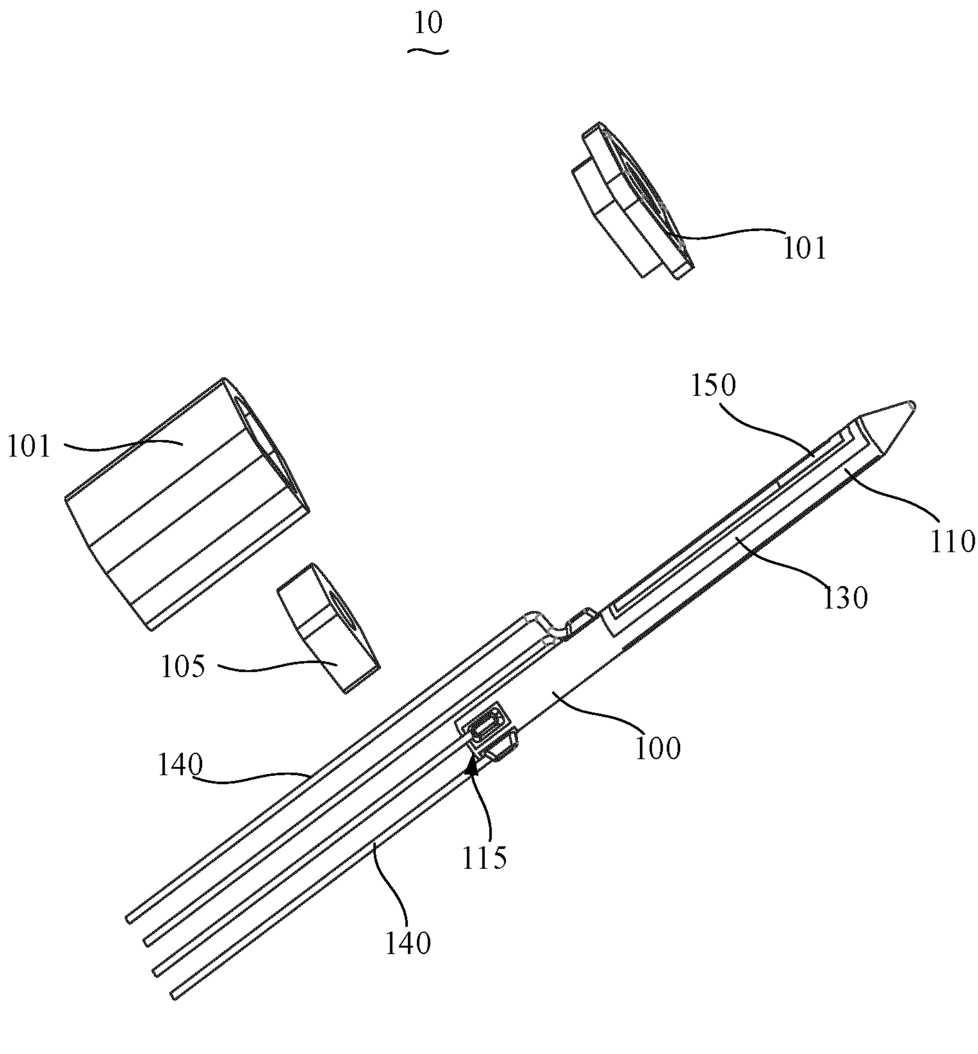
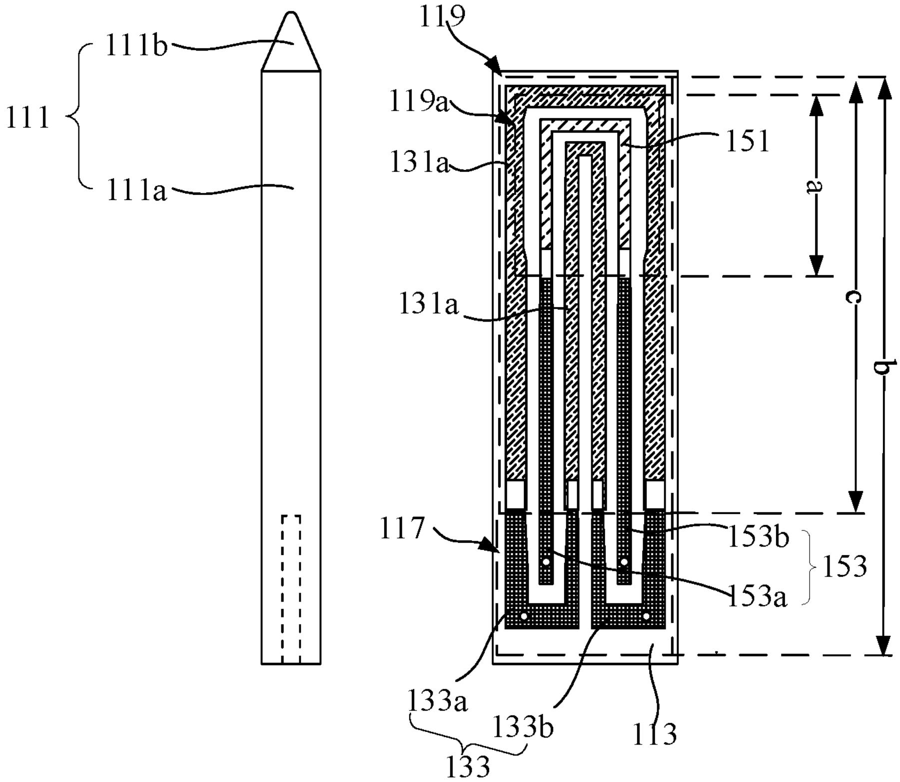


FIG. 2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133

FIG. 3

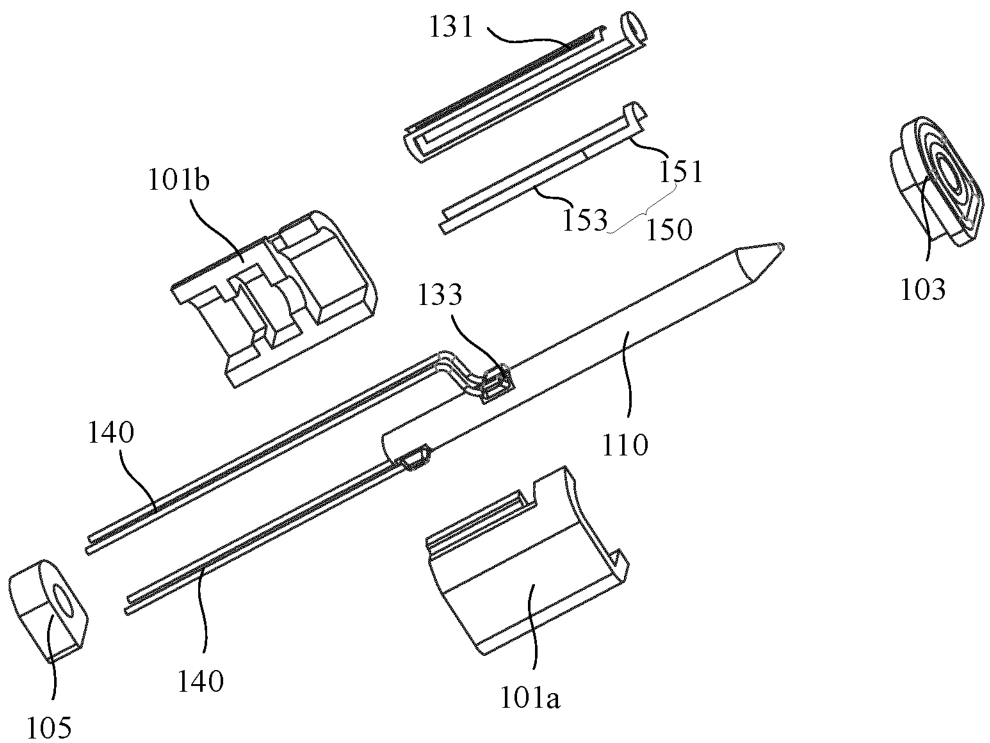


FIG. 4

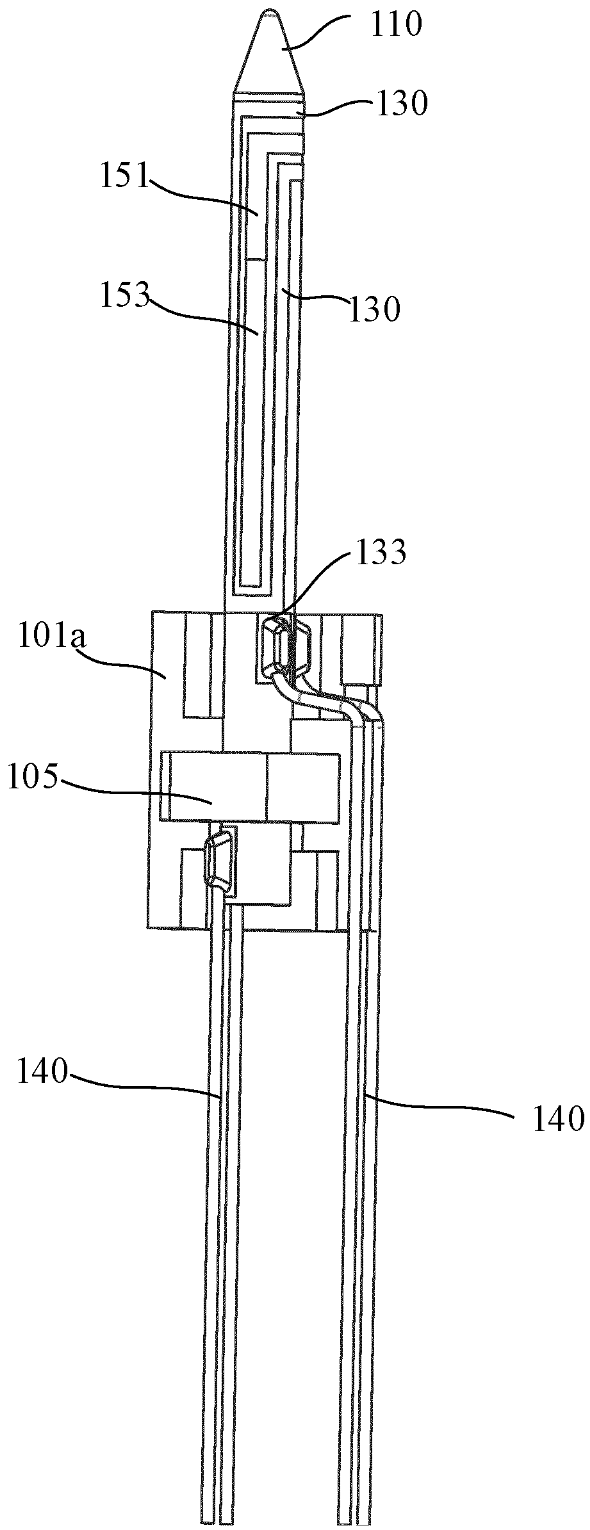


FIG. 5

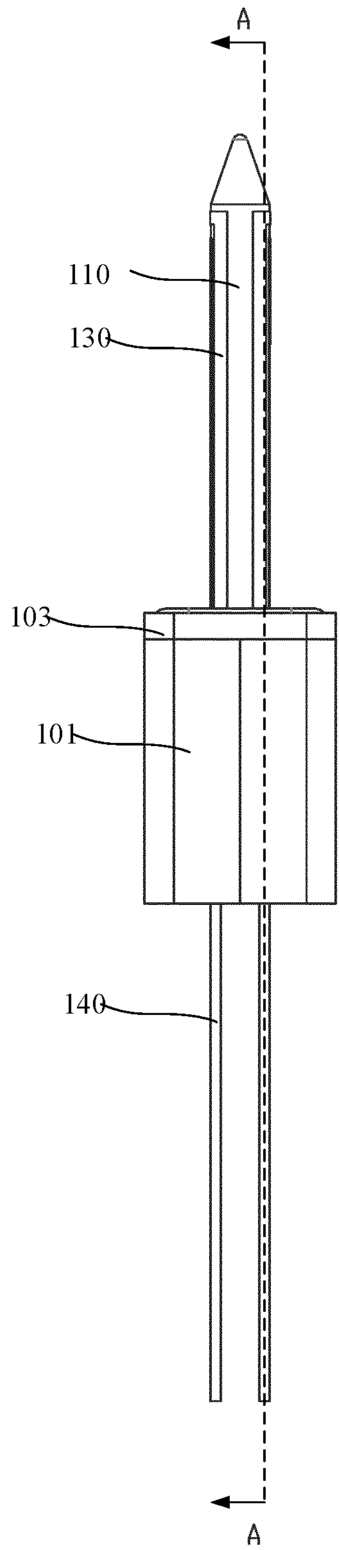


FIG. 6

A-A

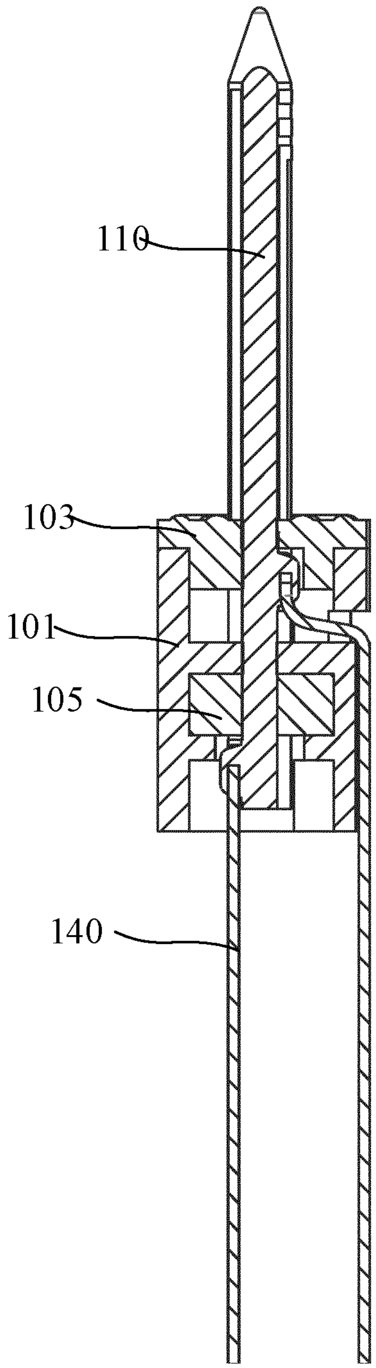


FIG. 7

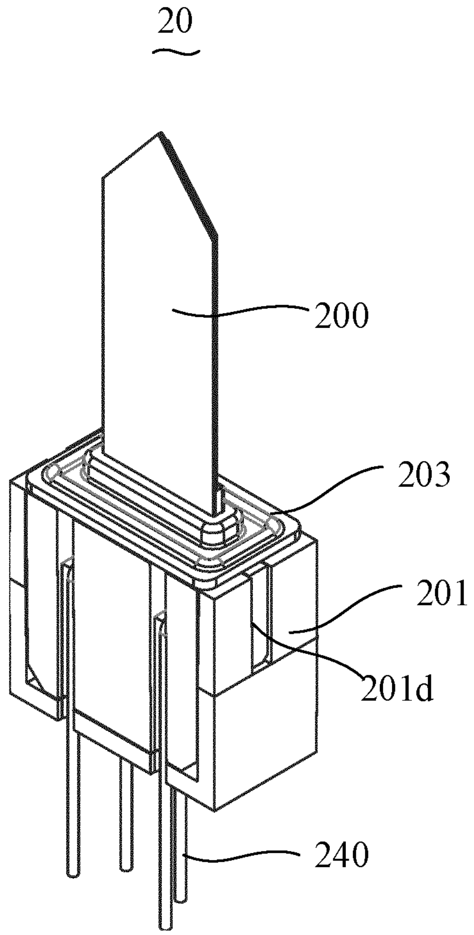


FIG. 8

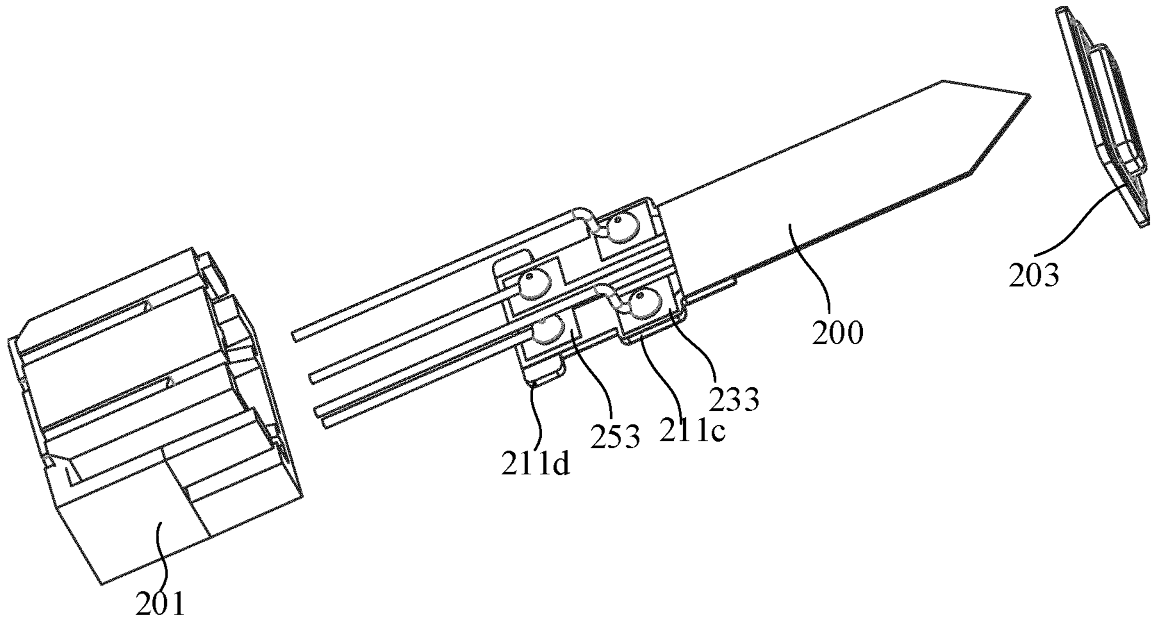
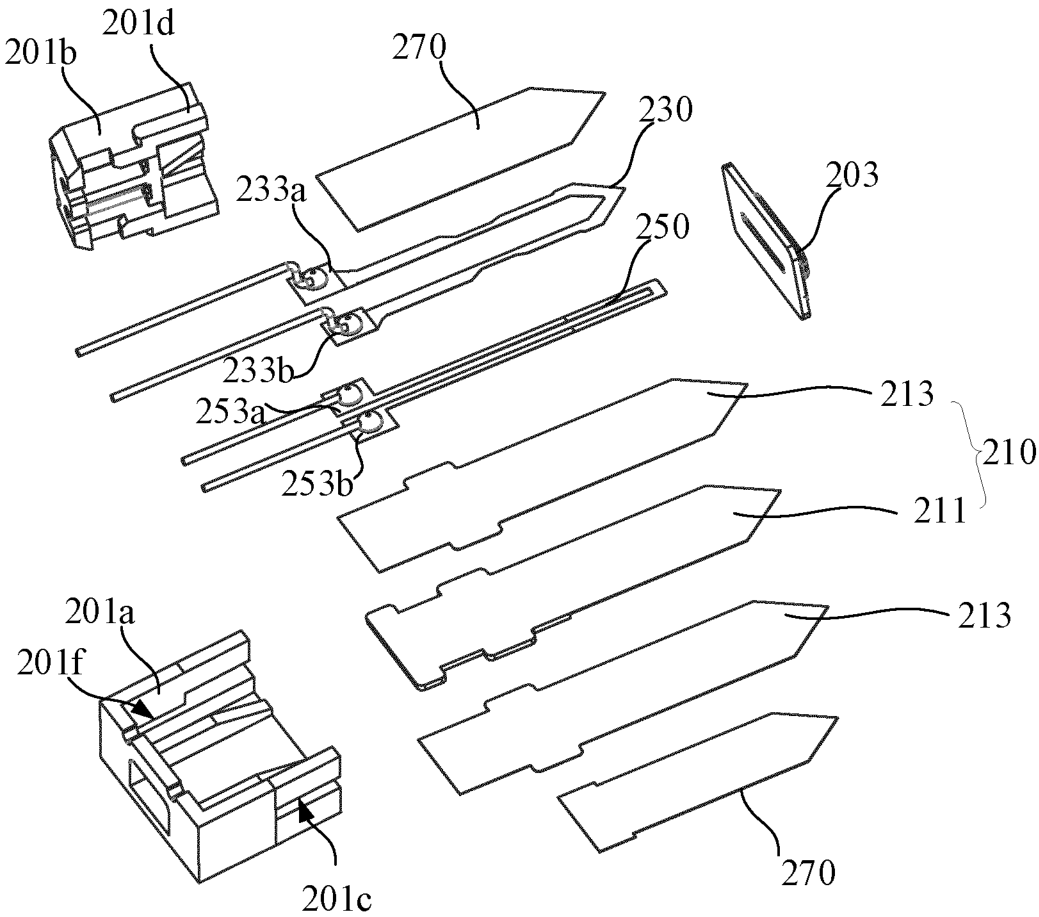


FIG. 9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201c

FIG. 10

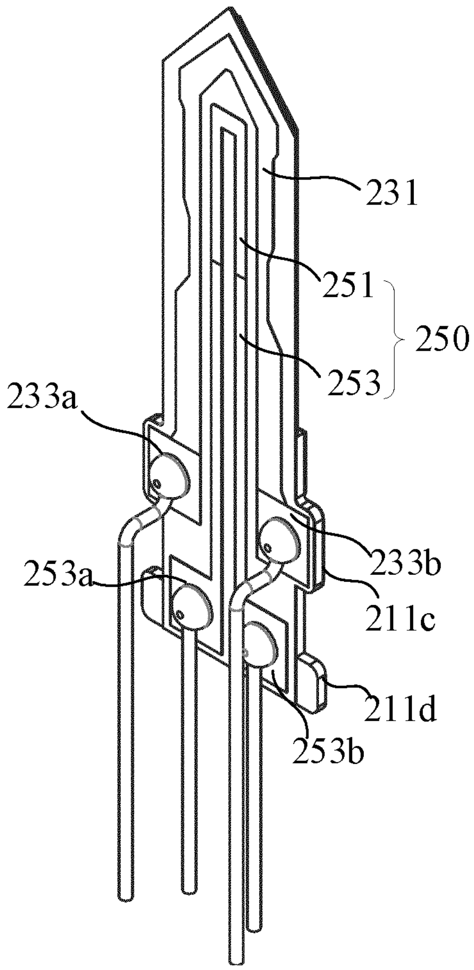


FIG. 11

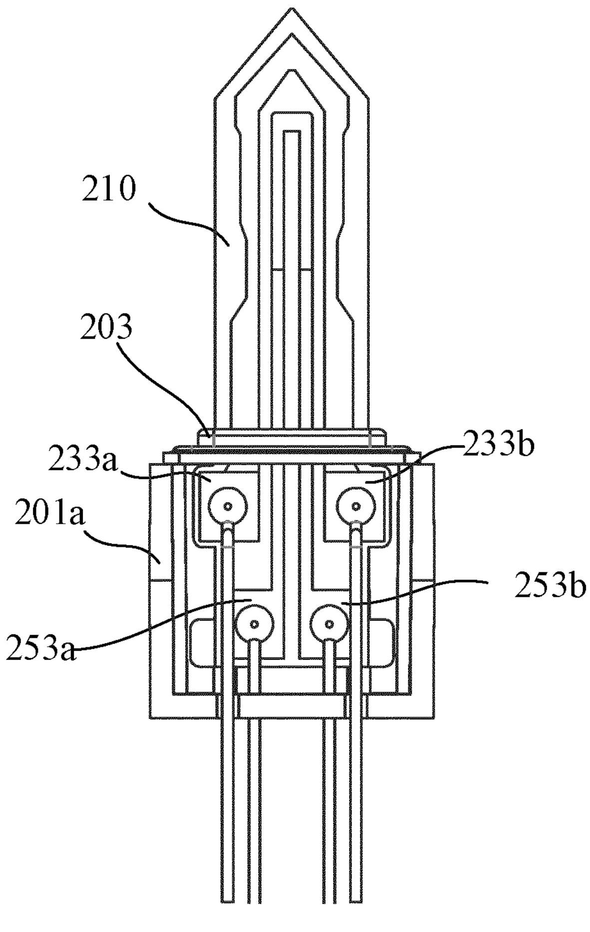
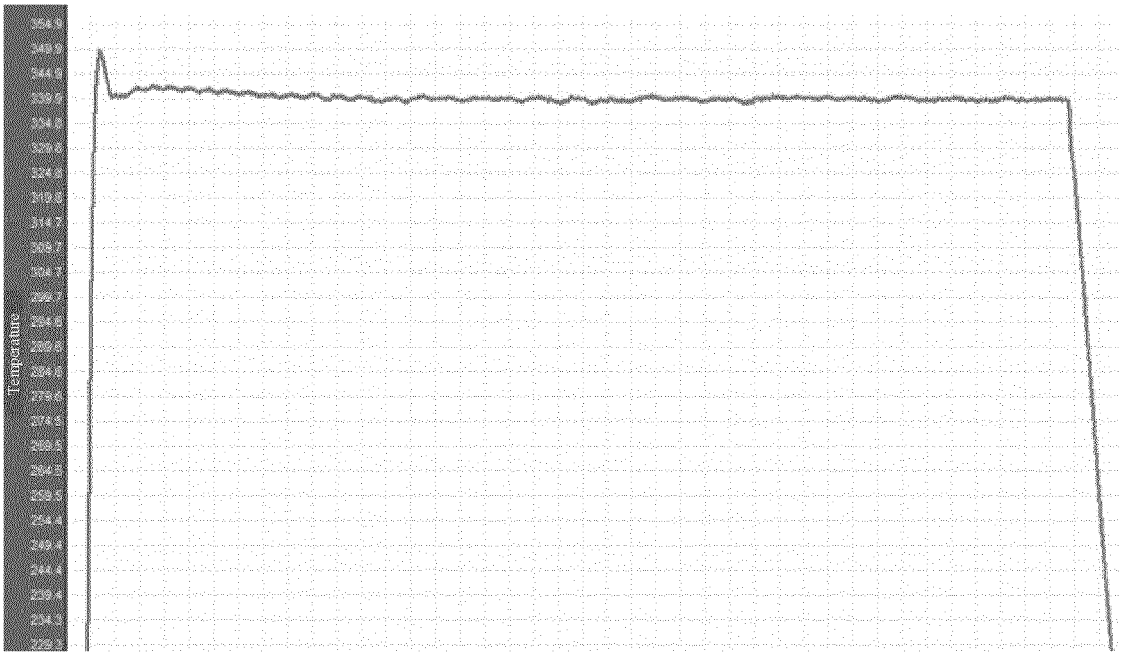


FIG. 12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294.6
289.6
284.6
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274.5
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264.5
259.5
254.4
249.4
244.4
239.4
234.3
229.3

FIG. 13

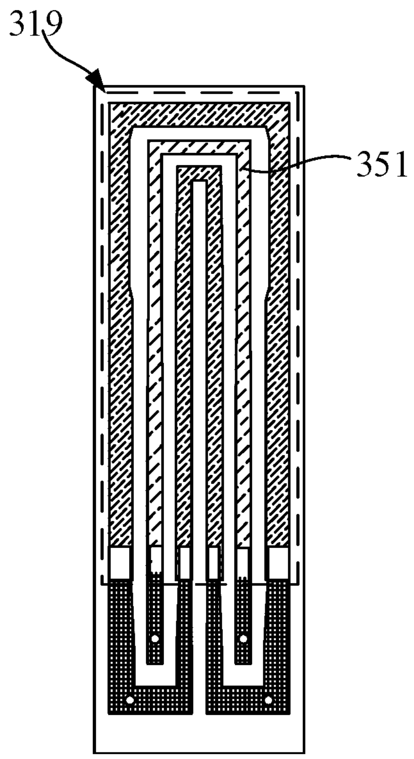

FIG. 14

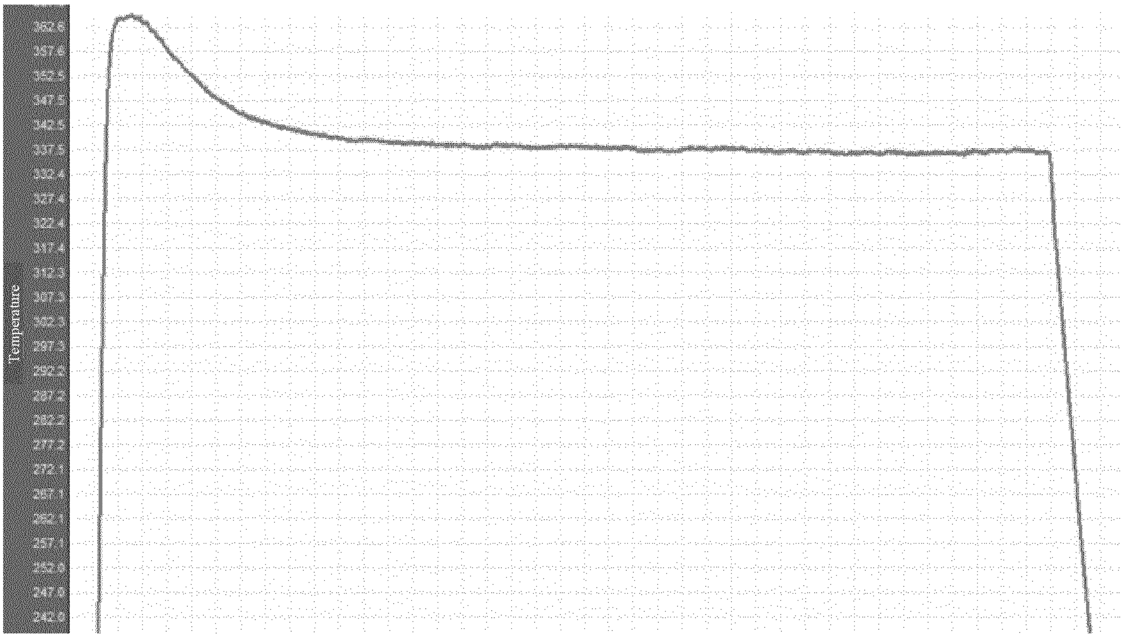
Temperature
362.6
357.6
352.5
347.5
342.5
337.5
332.4
327.4
322.4
317.4
312.3
307.3
302.3
297.3
292.2
287.2
282.2
277.2
272.1
267.1
262.1
257.1
252.0
247.0
242.0

FIG. 15

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2021/096296

A. CLASSIFICATION OF SUBJECT MATTER

A24F 40/57(2020.01)i； A24F 40/40(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; H05B

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)

CNABS, CNTXT, VEN, USTXT, EPTXT, WOTXT, CNKI, 万方: 发热, 加热, 控温, 测温, 高温, 分段, 多段, 分区, 多区, temperature, detect, measur+, control, sens+, heat+, electrode

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 112244355 A (SHENZHEN MAISHI TECHNOLOGY CO., LTD.) 22 January 2021 (2021-01-22) description, paragraphs 54-72, and figures 1-9	1-20
PX	CN 112244359 A (SHENZHEN MAISHI TECHNOLOGY CO., LTD.) 22 January 2021 (2021-01-22) description, paragraphs 15-17, and figures 1-3	1-20
Y	WO 2019088615 A2 (KT & G CORP.) 09 May 2019 (2019-05-09) description pages 25-42, 71-109, figures 1-10	1-20
Y	CN 206443202 U (CHINA TOBACCO HUNAN INDUSTRIAL CO., LTD.) 29 August 2017 (2017-08-29) description, paragraphs 62-76, and figures 1-9	1-20
Y	CN 110959918 A (SHENZHEN MAISHI TECHNOLOGY CO., LTD.) 07 April 2020 (2020-04-07) description, paragraphs 27-47, and figures 3-5	9, 19-20
Y	CN 209930528 U (SHENZHEN TOPWISE COMMUNICATION CO., LTD.) 10 January 2020 (2020-01-10) description, paragraphs 54-70, and figures 1-8	1-20

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

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- "&" 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 July 2021	**19 August 2021**

Name and mailing address of the ISA/CN	Authorized officer
China National Intellectual Property Administration (ISA/CN) **No. 6, Xitucheng Road, Jimenqiao, Haidian District, Beijing 100088** **China**	
Facsimile No. **(86-10)62019451**	Telephone No.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2021/096296

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	CN 107969734 A (ZHUHAI CERAHEATER TECHNOLOGY CO., LTD.) 01 May 2018 (2018-05-01) description, paragraphs 30-48, and figures 1-4	1-20
Y	CN 208228305 U (KEY MATERIAL CO., LTD.) 14 December 2018 (2018-12-14) description, paragraphs 30-48, and figures 1-3	1-20
A	CN 109315838 A (POWERTHINK TECHNOLOGY CO., LTD.) 12 February 2019 (2019-02-12) entire document	1-20
A	CN 207544334 U (SHENZHEN YUNMENG TECHNOLOGY CO., LTD.) 29 June 2018 (2018-06-29) entire document	1-20
A	CN 210694398 U (KEY MATERIAL CO., LTD.) 05 June 2020 (2020-06-05) entire document	1-20
A	CN 208549031 U (CHEN, Mei) 26 February 2019 (2019-02-26) entire document	1-20
A	CN 207518878 U (SHENZHEN FIRST UNION TECHNOLOGY CO., LTD.) 19 June 2018 (2018-06-19) entire document	1-20
A	KR 102029225 B1 (KOREA NEW CERAM CO., LTD.) 08 October 2019 (2019-10-08) entire document	1-20
A	CN 108652088 A (CHINA TOBACCO YUNNAN INDUSTRIAL L.L.C.) 16 October 2018 (2018-10-16) entire document	1-20
A	CN 209376692 U (VAPETALK ELECTRONIC TECHNOLOGY (SHENZHEN) COMPANY LIMITED.) 13 September 2019 (2019-09-13) entire document	1-20
A	CN 109496129 A (BRITISH AMERICAN TOBACCO (INVESTMENTS) LIMITED) 19 March 2019 (2019-03-19) entire document	1-20

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

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2021/096296

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
CN	112244355	A	22 January 2021	None			
CN	112244359	A	22 January 2021	None			
WO	2019088615	A2	09 May 2019	CN	111869937	A	03 November 2020
				CN	111050581	A	21 April 2020
				WO	2019088615	A3	20 June 2019
CN	206443202	U	29 August 2017	None			
CN	110959918	A	07 April 2020	CN	212014440	U	27 November 2020
CN	209930528	U	10 January 2020	None			
CN	107969734	A	01 May 2018	None			
CN	208228305	U	14 December 2018	None			
CN	109315838	A	12 February 2019	WO	2020087872	A1	07 May 2020
				JP	2021508233	A	04 March 2021
CN	207544334	U	29 June 2018	None			
CN	210694398	U	05 June 2020	None			
CN	208549031	U	26 February 2019	None			
CN	207518878	U	19 June 2018	US	2019166654	A1	30 May 2019
				EP	3481145	A1	08 May 2019
				JP	2019106984	A	04 July 2019
				KR	20190064515	A	10 June 2019
KR	102029225	B1	08 October 2019	None			
CN	108652088	A	16 October 2018	None			
CN	209376692	U	13 September 2019	None			
CN	109496129	A	19 March 2019	KR	20190021439	A	05 March 2019
				CL	2019000182	A1	07 June 2019
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				AU	2017301985	A1	07 February 2019
				RU	2020111196	A	18 May 2020
				BR	112019001744	A2	07 May 2019
				RU	2718354	C1	02 April 2020
				EP	3490395	A1	05 June 2019
				JP	2019526237	A	19 September 2019
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				AR	109139	A1	31 October 2018
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				MX	2019001149	A	10 June 2019
				CA	3031703	A1	01 February 2018
				WO	2018019855	A1	01 February 2018
				PH	12019500155	A1	21 October 2019

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- CN 202011066148 **[0001]**