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(54) HEATING ASSEMBLY AND AEROSOL GENERATING DEVICE

(57) A heating assembly and an aerosol generating device. The heating assembly (10) comprises a base body (11), a heating layer (12), and a temperature measurement layer (13); the base body (11) is used for accommodating an aerosol generating substrate; the heating layer (12) is provided on the surface of the base body (11), and is used for heating and atomizing the aerosol generating substrate when powered on; the temperature measurement layer (13) is provided on the surface of the base body (11) and/or the heating layer (12), and the temperature measurement layer (13) has a temperature coefficient of resistance characteristic. The heating assembly (10) is not only convenient to install, but also occupies a small space.

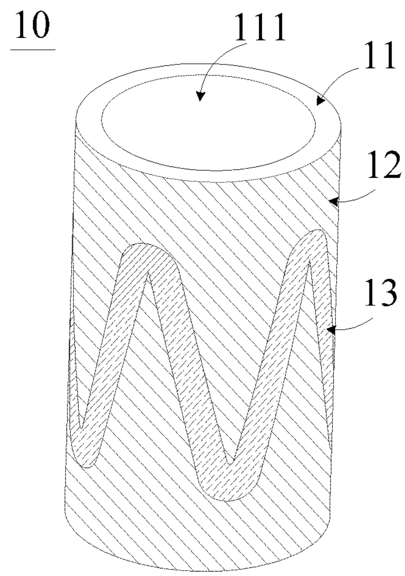

FIG. 1

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Description

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] The present application claims priority to Chinese Patent Application No. 202111423299.8, filed November 26, 2021, which is herein incorporated by reference in its entirety.

TECHNICAL FIELD

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

BACKGROUND

[0003] A heat-not-burning (HNB) aerosol generating device has been attracted more and more attention and favored by people, because the HNB aerosol generating device has advantages of safety, convenience, health, environmental protection, etc.

[0004] The existing HNB aerosol generating device generally includes a heating assembly and a power supply assembly. The heating assembly is configured to heat and atomize an aerosol generating substrate in response to electrifying the heating assembly. The power supply assembly is connected to the heating assembly and configured for supplying power to the heating assembly. In the heating process, it is often necessary to monitor the temperature of the heating assembly or the temperature of the aerosol generating substrate of the heating assembly in real time, so as to adjust a temperature field at any time to meet different temperature requirements. At present, an external temperature measuring element, such as a thermocouple temperature sensor or the like, is generally added to measure the temperature of the heating assembly in real time, so as to adjust a heating temperature at any time.

[0005] However, a separate temperature measuring sensor or a separate temperature measuring element is added to measure the temperature, which may not only occupy a large space, but also be inconvenient to dispose.

SUMMARY OF THE DISCLOSURE

[0006] The present disclosure provides a heating assembly and an aerosol generating device. The heating assembly may solve an existing problem that adding a separate temperature measuring sensor or a separate temperature measuring element to measure the temperature may occupy a large space and be inconvenient to dispose.

[0007] In a first aspect, the present disclosure provides a heating assembly. The heating assembly includes a base body, a heating layer, and a temperature measuring layer. The base body is configured for accommodating an aerosol generating substrate. The heating layer is disposed on a surface of the base body, and the heating layer is configured to heat and atomize the aerosol generating substrate in response to electrifying the heating layer. The temperature measuring layer is disposed on the surface of the base body and/or the heating layer, and the temperature measuring layer has the temperature coefficient of resistance (TCR) characteristic.

[0008] In some embodiments, the temperature measuring layer is disposed on a surface of the heating layer away from the base body.

[0009] In some embodiments, the temperature measuring layer is disposed on the surface of the base body, and the temperature measuring layer and the heating layer are disposed on the same surface of the base body and spaced apart from each other.

[0010] In some embodiments, the temperature measuring layer is disposed on the surface of the base body, and disposed between the base body and the heating layer.

[0011] In some embodiments, the temperature measuring layer is disposed on the surface of the base body, and the temperature measuring layer and the heating layer are disposed on different surfaces of the base body.

[0012] In some embodiments, the temperature measuring layer is disposed around the base body for one circle along the circumferential direction of the base body.

[0013] In some embodiments, the temperature measuring layer is disposed on an end of the base body.

[0014] In some embodiments, the temperature measuring layer is disposed in the middle of the base body and is distributed in a wave shape along the circumferential direction of the base body.

[0015] In some embodiments, the temperature measuring layer at least covers a region of the heating assembly with the highest temperature.

[0016] In some embodiments, the heating layer is an infrared heating film.

[0017] In some embodiments, the base body is a hollow column, the heating layer is disposed on the outer surface of the hollow column.

[0018] In some embodiments, the base body is a hollow column, and the heating layer is disposed on the inner surface of the hollow column.

[0019] In some embodiments, the heating layer and the temperature measuring layer are disposed on the outer surface of the base body by silk screen printing or coating, and the area of the temperature measuring layer is smaller than that of the heating layer.

[0020] In some embodiments, the base body is a quartz.

[0021] In a second aspect, the present disclosure provides an aerosol generating device. The aerosol generating device includes a heating assembly of any one in above embodiments, a power supply assembly, and a controller. The heating assembly is configured for heating and atomizing the aerosol generating substrate in response to electrifying the heating assembly. The power supply assembly is configured for being connected to the heating assembly, and configured for supplying power to the heating assembly. The controller is configured for controlling the power supply assembly to supply power to the heating assembly, detect the resistance value of the temperature measuring layer in real time, and monitor the temperature of the heating assembly according to the resistance value.

[0022] In the heating assembly and the aerosol generating device provided in the present embodiment, the base body is provided to accommodate the aerosol generating substrate. The heating layer is disposed on the surface of the base body, and the aerosol generating substrate is heated and atomized in response to electrifying the heating layer. Moreover, the temperature measuring layer is disposed on the surface of the base body and/or the surface of the heating layer, and the temperature measuring layer has the temperature coefficient of resistance (TCR) characteristic. Thus, the temperature value of the heating assembly may be monitored by detecting the resistance value of the temperature measuring layer. Compared with the related art, in the present disclosure, the temperature measuring layer is in the form of a film. The temperature measuring layer may be directly deposited on the surface of the base body and/or the surface of the heating layer, without the need to fix the temperature measuring layer on the surface of the base body and/or the surface of the heating layer by defining an installing groove or disposing a fixed element such as a screw or the like on the surface of the base body and/or the surface of the heating layer. Thus, the temperature measuring layer is not only convenient to dispose, but also occupies a small space. In addition, according to actual needs, the temperature measuring layer may cover some specific positions of the base body and/or some specific positions of the heating layer, or cover a larger region of the surface of the base body and/or a larger region of the surface of the heating layer. Thus, the temperature of a specific region on the surface of the base body and/or the surface of the heating layer may be measured, and the accuracy of the temperature measurement is high. The temperature may be measured for most regions of the base body and/or most regions of the heating layer, effectively expanding the temperature measurement range of the heating assembly.

BRIEF DESCRIPTION OF THE DRAWINGS

[0023] In order to more clearly illustrate the technical solutions in some embodiments of the present disclosure, hereinafter, a brief introduction will be given to the accompanying drawings that are used in the description of some embodiments. Obviously, the accompanying drawings in the description below are merely some embodiments of the present disclosure. For those of ordinary skill in the art, other accompanying drawings may be obtained based on these accompanying drawings without any creative efforts.

FIG. 1 is a structural schematic view of a heating assembly in a first embodiment of the present disclosure.

FIG. 2 is a structural sketch of the heating assembly of FIG. 1.

FIG. 3 is a structural schematic view of the heating assembly in a second embodiment of the present disclosure.

FIG. 4 is a cross-sectional structural schematic view of the heating assembly of FIG. 3 in an A-A direction.

FIG. 5 is a structural schematic view of the heating assembly in a third embodiment of the present disclosure.

FIG. 6 is a structural sketch of the heating assembly of FIG. 5.

FIG. 7 is a structural schematic view of the heating assembly in a fourth embodiment of the present disclosure.

FIG. 8 is a structural schematic view of an aerosol generating device in an embodiment of the present disclosure.

DETAILED DESCRIPTION

[0024] The technical solutions in some embodiments of the present disclosure may be clearly and completely described in conjunction with accompanying drawings in some embodiments of the present disclosure. Obviously, the described embodiments are only a part of the embodiments of the present disclosure, and not all embodiments. Based on the embodiments in the present disclosure, all other embodiments obtained by those of ordinary skill in the art without creative effort are within the scope of the present disclosure.

[0025] The terms "first", "second", and "third" in the present disclosure are only configured to describe purposes and cannot be understood as indicating or implying relative importance or implicit indicating the quantity of technical features indicated. Therefore, features limited to "first", "second", and "third" may explicitly or implicitly include at least one of these features. In the description of the present disclosure, "multiple" means at least two, such as two, three, etc., unless otherwise expressly and specifically qualified. All directional indications (such as up, down, left, right, front, rear, or the like) in some embodiments of the present disclosure are only configured to explain a relative position relationship between components in a specific posture (as shown in the accompanying drawings), a motion situation between the components in the specific posture (as shown in the accompanying drawings), or the like. If the specific posture is changed, the directional indication is also changed accordingly. In addition, the terms "including", "comprising", and "having", as well as any variations of the terms "including", "comprising", and "having", are intended to cover non-exclusive inclusions. For example, a process, method, system, product, or device that includes a series of operations or units is not limited to the listed operations or units, but optionally includes operations or units that are not listed, or optionally includes other operations or units that are inherent to these processes, methods, products, or devices.

[0026] The reference to "embodiment" in the present disclosure means that, specific features, structures, or characteristics described in conjunction with some embodiments may be included in at least one embodiment of the present disclosure. The phrase appearing in various positions in the specification does not necessarily refer to the same embodiment, nor is it an independent or alternative embodiment that is mutually exclusive with other embodiments. Those of ordinary skill in the art explicitly and implicitly understand that the embodiments described in the present disclosure may be combined with other embodiments.

[0027] The present disclosure may be explained in detail by combining the accompanying drawings and some embodiments.

[0028] As illustrated in FIG. 1 and FIG. 2, FIG. 1 is a structural schematic view of a heating assembly in a first embodiment of the present disclosure, and FIG. 2 is a structural sketch of the heating assembly of FIG. 1. In the present embodiment, a heating assembly 10 is provided, and the heating assembly 10 is configured for heating and atomizing an aerosol generating substrate to form aerosol in response to electrifying the heating assembly 10. The heating assembly 10 may be used in different fields, such as an electronic atomizing field or other fields. In some embodiments, the heating assembly 10 includes a base body 11, a heating layer 12, and a temperature measuring layer 13.

[0029] The base body 11 may be in a shape of a hollow cylinder, and a hollow structure of the base body 11 forms an accommodating cavity 111, and the accommodating cavity 111 is configured for accommodating the aerosol generating substrate. The aerosol generating substrate may be a plant-grass-like substrate or a paste-like substrate, etc. The base body 11 is made of insulating material, and the base body 11 may be a high temperature resistant insulating material, such as a quartz glass, a ceramic, or mica, etc., so as to prevent short circuit between two electrodes. In an embodiment, the base body 11 may be a transparent quartz. In an embodiment, the base body 11 may also be made of a conductive material, and in this case an insulating layer may be coated on the surface of the base body 11. In an embodiment, the base body 11 is a cylindrical ceramic tube. In the following embodiments, the inner surface of the base body 11 refers to the inner wall surface of the accommodating cavity 111, and the outer surface of the base body 11 refers to the outer wall surface of the accommodating cavity 111.

[0030] The heating layer 12 is disposed on the surface of the base body 11 and configured for heating in response to electrifying the heating layer 12, so as to heat and atomize the aerosol generating substrate. In some embodiments, the heating layer 12 may be formed on the inner surface or the outer surface of the base body 11 by means of silk screen printing, sputtering, coating, printing, or the like. The infrared rays have a certain degree of penetration and do not require a medium, so that the heating efficiency is high, and the aerosol generating substrate is heat more uniformly.

[0031] In an embodiment, the heating layer 12 may be an infrared heating layer, such as an infrared ceramic coating. The infrared heating layer may be an infrared heating film. The thickness and the area of the infrared heating film are not limited, and may be selected according to needs. The infrared heating layer may be a metal layer, a conductive ceramic layer, or a conductive carbon layer. The shape of the infrared heating layer may be a continuous film, a porous mesh, or a strip. The material, the shape, and the size of the infrared heating layer may be selected according to needs. In an embodiment, the infrared heating layer radiates the infrared rays in response to electrifying the infrared heating layer, so as to heat the aerosol generating substrate in the accommodating cavity 111. The wavelength of infrared heating ranges from 2.5 μm to 20 μm. According to the characteristic of heating the aerosol generating substrate, a heating temperature usually needs to be greater than or equal to 350 °C, and an energy radiation extreme value is mainly in a band that ranges from 3 μm to 5 μm.

[0032] The temperature measuring layer 13 is disposed on the surface of the base body 11 and/or the surface of the heating layer 12, and the temperature measuring layer 13 has the temperature coefficient of resistance (TCR) characteristic. That is, the resistance value of the temperature measuring layer 13 has a monotonous one-to-one correspondence with the temperature value of the temperature measuring layer 13. For example, the resistance value of the temperature measuring layer 13 increases as the temperature value of the temperature measuring layer 13 increases. Alternatively, the resistance value of the temperature measuring layer 13 reduces as the temperature value of the temperature measuring layer 13 increases. Thus, the temperature value of the heating assembly 10 may be monitored by detecting the resistance value of the temperature measuring layer 13, thereby adjusting the temperature field of the heating assembly 10 to achieve the best effect of the taste of smoking. The additional temperature measuring element, such as the temperature measuring sensor, is required in a related art. Compared with the related art, in the present disclosure, the temperature measuring layer 13 is in the form of a film. The temperature measuring layer 13 may be directly deposited on the surface of the base body 11 and/or the surface of the heating layer 12, without the need to fix the temperature measuring layer 13 on the surface of the base body 11 and/or the surface of the heating layer 12 by defining an installing groove or disposing a fixed element such as a screw or the like on the surface of the base body 11 and/or the surface of the heating layer 12. Thus, the temperature measuring layer 13 is not only convenient to dispose, but also occupies a small space. In addition, according to actual needs, the temperature measuring layer 13 may cover some specific positions of the base body 11 and/or some specific positions of the heating layer 12, or cover a larger region of the surface of the base body 11 and/or a larger region of the surface of the heating layer 12. Thus, the temperature of a specific region on the surface of the base body 11 and/or the surface of the heating layer 12 may be measured, and the accuracy of the temperature measurement is high. The temperature may be measured for most regions of the base body 11 and/or most regions of the heating layer 12, effectively expanding the temperature measurement range of the heating assembly 10.

[0033] In an embodiment, the temperature measurement layer 13 may also be formed on the surface of the substrate 11 and/or the surface of the heating layer 12 by means of screen printing, sputtering, coating, printing, or the like. The temperature measuring layer 13 may at least cover a region of the heating assembly 10 with the highest temperature, so as to avoid the problem that a local temperature is too high and the taste of heating the aerosol generating substrate is affected. In an embodiment, in response to the region of the heating assembly 10 with the highest temperature corresponding to one region of the base body 11, the temperature measuring layer 13 at least covers this region of the base body 11. In response to the region of the heating assembly 10 with the highest temperature corresponding to one position of the heating layer 12, the temperature measuring layer 13 at least covers this position of the heating layer 12.

[0034] In an embodiment, a square resistance of the temperature measuring layer 13 ranges from 1 Ω/□ to 5 Ω/□, and a resistance temperature coefficient of the temperature measuring layer 13 ranges from 300 ppm/°C to 3500 ppm/°C. In an embodiment, the square resistance of the temperature measuring layer 13 ranges from 2 Ω/□ to 4 Ω/□, and the resistance temperature coefficient of the temperature measuring layer 13 ranges from 700 ppm/°C to 2000 ppm/°C.

[0035] The resistance of the temperature measuring layer 13 is relatively large, and the temperature measuring layer 13 only achieves the temperature measuring function. Thus, in an embodiment, the area of the temperature measuring layer 13 may be smaller than the area of the heating layer 12, which may not only reduce energy consumption, but also does not affect the heating effect of the infrared heating layer 12. Furthermore, the overall temperature field of the heating layer 12 may be consistent. In an embodiment, the ratio of the area of the temperature measuring layer 13 to the area of the heating layer 12 may range from 1:5 to 1:10.

[0036] In an embodiment, the resistance paste for preparing the temperature measuring layer 13 includes an organic carrier, an inorganic binder, and a conductive agent. In terms of the number of mass parts, the number of parts of the organic carrier ranges from 10 parts to 20 parts, and the number of parts of the inorganic binder ranges from 30 parts to 45 parts, the number of parts of the conductive agent ranges from 30 parts to 50 parts. The inorganic binder includes glass powder, and the conductive agent is at least one selected from silver and palladium.

[0037] In an embodiment, the organic carrier is at least one selected from a terpineol, an ethyl cellulose, a butyl carbitol, a polyvinyl butyral, a tributyl citrate and a polyamide wax.

[0038] In an embodiment, the inorganic binder includes the glass powder with a melting point of 700 °C to 780 °C.

[0039] As illustrated in FIG. 1, the temperature measuring layer 13 may be disposed around the base body 11 for one circle along the circumferential direction of the base body 11. In the present embodiment, two electrodes may be respectively disposed at two preset positions of the temperature measuring layer 13, and the two electrodes are respectively configured to connect to the positive electrode wire and the negative electrode wire, so as to detect the resistance value of the temperature measuring layer 13. In other embodiments, the temperature measuring layer 13 may also be in the shape of the arc with a notch along the circumferential direction of the base body 11. The two ends where the notch of the temperature measuring layer 13 is located may be formed as two electrodes, to respectively connect to the positive electrode wire and the negative electrode wire, which is not limited in the present disclosure.

[0040] In an embodiment, the temperature measuring layer 13 may be distributed in a wave shape manner along the circumferential direction of the base body 11 to cover different areas of the heating assembly 10 as much as possible, and further sense the temperature on different positions of the heating assembly 10, so that the temperatures of the different regions of the heating assembly 10 are detected. In an embodiment, the base body 11 is tubular, the temperature measurement layer 13 is disposed in the middle of the base body 11 and undulates along the length direction of the base body 11, thereby covering different regions along the length direction of the base body 11. In other embodiments, the temperature measuring layer 13 may also be distributed in a linear shape manner, a connected "Z" shape manner, a U shape manner, a bent shape manner, a point shape manner, or the like along the circumferential direction of the base body 11.

[0041] In an embodiment, the materials of the temperature measuring layer 13 and the heating layer 12 may be the same. The power of the temperature measuring layer 13 is greater than the power of the heating layer 12.

[0042] In an embodiment, the temperature measuring layer 13 and the heating layer 12 may be disposed on the same surface of the base body 11, or on different surfaces of the base body 11. In an embodiment, one of the temperature measuring layer 13 and the heating layer 12 is disposed on the inner surface of the base body 11, and the other of the temperature measuring layer 13 and the heating layer 12 is disposed on the outer surface of the base body 11. The temperature measuring layer 13 may only be disposed on the surface of the heating layer 12, may only be disposed on the surface of the base body 11, or may be simultaneously disposed on the surface of the heating layer 12 and the surface of the base body 11. In an embodiment, a part of the temperature measuring layer 13 is disposed on the surface of the heating layer 12, and another part of the temperature measuring layer 13 is provided on the surface of the base body 11. The temperature measuring layer 13 may be disposed on the surface of the heating layer 12 away from the base body 11, or on the surface of the heating layer 12 close to the base body 11.

[0043] In a first embodiment, as illustrated in FIG. 1 and FIG. 2, the heating layer 12 is disposed on the outer surface of the base body 11, and the temperature measuring layer 13 is only disposed on the surface of the heating layer 12 away from the base body 11. After the heating layer 12 is electrified, the temperature of the heating layer 12 increases, and the temperature of the temperature measuring layer 13 increases as the temperature of the heating layer 12 increases. The resistance value of the temperature measuring layer 13 changes as the temperature of the temperature measuring layer 13 changes, so that the temperature value of the heating assembly 10 may be monitored in real time by detecting the resistance value of the temperature measuring layer 13.

[0044] In an embodiment, as illustrated in FIG. 1, the base body 11 is a hollow column, and the heating layer 12 covers entire outer surface of the base body 11, which may avoid heat generated by the heating layer 12 being conducted by the base body 11. Thus, it avoids heat loss and avoids causing a large error in the temperature measurement result. Furthermore, it avoids scratching of the heating layer 12 by the aerosol generating substrate. In the present embodiment, the temperature measuring layer 13 may be disposed in the middle of the base body 11 along the axial direction of the base body 11, and around the outer surface of the base body 11 for one circle.

[0045] In a second embodiment, as illustrated in FIG. 3 and FIG. 4, FIG. 3 is a structural schematic view of the heating assembly in a second embodiment of the present disclosure, and FIG. 4 is a cross-sectional structural schematic view of the heating assembly of FIG. 3 in an A-A direction. The heating layer 12 may also be disposed on the inner surface of the base body 11, and the temperature measuring layer 13 is disposed on the surface of the heating layer 12 away from the base body 11, which is not limited in the present disclosure.

[0046] In a third embodiment, as illustrated in FIG. 5 and FIG. 6, FIG. 5 is a structural schematic view of the heating assembly in a third embodiment of the present disclosure, and FIG. 6 is a structural sketch of the heating assembly of FIG. 5. The temperature measuring layer 13 is disposed on the surface of the base body 11. The temperature measuring layer 13 and the heating layer 12 are disposed on the same surface of the base body 11 and spaced apart from each other. In the present embodiment, the heating layer 12 generates heat after the heating layer 12 is electrified, and the heat of the heating layer 12 is conducted or transferred to the surface of the base body 11. Thus, the temperature of the temperature measuring layer 13 disposed on the surface of the base body 11 changes as the temperature of the base body 11 changes, and the resistance value of the temperature-measuring layer 13 changes as the temperature of the temperature-measuring layer 13 changes. Thus, the temperature value of the heating assembly 10 may be monitored in real time by detecting the resistance value of the temperature-measuring layer 13.

[0047] In the present embodiment, the temperature measuring layer 13 is disposed on any position of the base body 11 or covers any position of the base body 11 according to actual needs. In an embodiment, in response to monitoring the temperature of a first end of the base body 11, the temperature measuring layer 13 may be disposed on the first end. In response to monitoring the temperature of the middle of the base body 11, the temperature measuring layer 13 may be disposed in the middle of the base body 11, as illustrated in FIG. 1. In response to simultaneously monitoring the temperature of the first end and the temperature of a second end of the base body 11, multiple temperature measuring layers 13 may be disposed, so that one temperature measuring layer 13 covers the first end, and another temperature measuring layer 13 covers the second end, so as to monitor the temperature of the corresponding position of the base body 11. In an embodiment, the heating layer 12 may be disposed on the first end of the outer surface of the base body 11, the temperature measuring layer 13 may be disposed on the second end of the base body 11, and the temperature measuring layer 13 is spaced apart from the heating layer 12. Thus, the temperature value of the second end of the base body 11 is detected by detecting the resistance value of the temperature measuring layer 13.

[0048] As illustrated in FIG. 5, the base body 11 is the hollow column, and the heating layer 12 is disposed on the outer surface of the base body 11 and only one end of the base body 11 is exposed. The temperature measuring layer 13 is disposed on an exposed region of the outer surface of the base body 11, and spaced apart from the heating layer 12. The temperature measuring layer 13 is disposed around the base body 11 along the circumferential direction of the base body 11. The temperature measuring layer 13 may be disposed around the base body 11 for one circle along the circumferential direction of the base body 11. That is, the temperature measuring layer 13 is in a closed ring shape. In an embodiment, the temperature measuring layer 13 may also be disposed in an open ring shape along the circumferential direction of the base body 11. That is, the radian corresponding to the temperature measuring layer 13 is less than 360 degrees.

[0049] In a fourth embodiment, as illustrated in FIG. 7, and FIG. 7 is a structural schematic view of the heating assembly in a fourth embodiment of the present disclosure. The temperature measuring layer 13 and the heating layer 12 are disposed on the same surface of the base body 11, such as the outer surface of the base body 11, and both the surface of the heating layer 12 away from the base body 11 and the surface of the base body 11 may be provided with the temperature measuring layer 13. The temperature measuring layer 13 disposed on the base body 11 is spaced apart from the heating layer 12. The temperature measuring layer 13 disposed on the base body 11 may be disposed around the base body 11 for one circle along the circumferential direction of the base body 11 and distributed in the linear shape. The temperature measurement layer 13 disposed on the surface of the heating layer 12 away from the base body 11 may correspond to the middle position of the base body 11 along the axial direction of the base body 11. The temperature measurement layer 13 disposed on the surface of the heating layer 12 away from the base body 11 may be disposed in a wave manner and around the base body 11 for one circle along the circumferential direction of the base body 11. The resistance detection method of two temperature measuring layers 13 may refer to the above relevant description, which is not repeated here.

[0050] By disposing the temperature measuring layer 13 on the surface of the heating layer 12 and the surface of the base body 11, the temperature measuring layer 13 may simultaneously sense the temperature of the base body 11 and the heating layer 12, so as to ensure that the temperature measuring layer 13 at least covers the region of the heating assembly 10 with the highest temperature. It avoids the large error of the temperature measurement results that is caused by the region of the heating assembly 10 with the highest temperature appearing in other regions not covered by the temperature measurement layer 13.

[0051] In a fifth embodiment, the temperature measuring layer 13 is disposed on the surface of the base body 11, and the temperature measuring layer 13 is disposed between the base body 11 and the heating layer 12. In the present embodiment, the temperature measuring layer 13 and the heating layer 12 are disposed on the same surface of the base body 11.

[0052] In a sixth embodiment, the temperature measuring layer 13 is disposed on the surface of the base body 11, and the temperature measuring layer 13 and the heating layer 12 are disposed on different surfaces of the base body 11. In an embodiment, the heating layer 12 is disposed on the inner surface of the base body 11 that is the hollow column, and the temperature measuring layer 13 is disposed on the outer surface of the base body 11. The temperature of the heating layer 12 after being electrified and heated is conducted to the base body 11, and the temperature of the base body 11 is further conducted to the temperature measuring layer 13, so that the resistance of the temperature measuring layer 13 changes as the temperature of the temperature measuring layer 13 changes. Alternatively, the heating layer 12 is disposed on the outer surface of the base body 11, and the temperature measuring layer 13 is disposed on the inner surface of the base body 11.

[0053] In the heating assembly 10 provided in the present embodiment, the base body 11 is provided to accommodate the aerosol generating substrate. The heating layer 12 is disposed on the surface of the base body 11. The aerosol generating substrate is heated and atomized in response to electrifying the heating layer 12. Moreover, the temperature measuring layer 13 is disposed on the surface of the base body 11 and/or the surface of the heating layer 12, and the temperature measuring layer 13 has the TCR characteristic. Thus, the temperature value of the heating assembly 10 may be monitored by detecting the resistance value of the temperature measuring layer 13. Compared with the related art, the temperature measuring layer 13 is not only convenient to dispose, but also occupies the small space. In addition, the temperature measuring layer 13 may cover the larger region of the surface of the base body 11 and/or the surface of the heating layer 12 according to actual needs. Thus, the temperature may be measured for most regions of the base body 11 and/or most regions of the heating layer 12, effectively expanding the temperature measurement range of the heating assembly 10.

[0054] As illustrated in FIG. 8, FIG. 8 is a structural schematic view of an aerosol generating device in an embodiment of the present disclosure. In the present embodiment, an aerosol generating device 100 is provided. The aerosol generating device 100 includes the heating assembly 10, a power supply assembly 20, and a controller 30.

[0055] The heating assembly 10 is configured for heating and atomizing the aerosol generating substrate to form the aerosol in response to electrifying the heating assembly 10. The heating assembly 10 may be the heating assembly 10 in any one of the above embodiments, and the specific structure and function may refer to the description of the specific structure and function of the heating assembly 10 in any one of the above embodiments, and may achieve the same or similar technology effects as follows.

[0056] The power supply assembly 20 is connected to the heating assembly 10 and configured for supplying power to the heating assembly 10. The heating assembly 10 and the power supply assembly 20 may be detachably connected, so as to facilitate the replacement of the heating assembly 10 and improve the utilization rate of the power supply assembly 20. In other embodiments, the power supply assembly 20 and the heating assembly 10 may also be integrally disposed, which is not limited in the present disclosure.

[0057] The controller 30 is configured to control the power supply assembly 20 to supply power to the heating assembly 10, detect the resistance value of the temperature measuring layer 13 of the heating assembly 10 in real time, and monitor the temperature of the heating assembly 10 according to the resistance value of the temperature measuring layer 13, thereby adjusting the temperature field of the heating assembly 10, so as to achieve the best effect of the taste of smoking.

[0058] In an embodiment, the aerosol generating device 100 further includes a casing 40, and the heating assembly 10 is disposed in the casing 40 and connected to the power supply assembly 20.

[0059] In the aerosol generating device 100 provided in the present embodiment, the heating assembly 10 is provided, and the base body 11 in the heating assembly 10 is provided to accommodate the aerosol generating substrate. The heating layer 12 is disposed on the surface of the base body 11, and the aerosol generating substrate is heated and atomized in response to electrifying the heating layer 12. Moreover, the temperature measuring layer 13 is disposed on the surface of the base body 11 and/or the surface of the heating layer 12, and the temperature measuring layer 13 has the TCR characteristic. Thus, the temperature value of the heating assembly 10 may be monitored by detecting the resistance value of the temperature measuring layer 13. Compared with the related art, the temperature measuring layer 13 is not only convenient to dispose, but also occupies the small space. In addition, the temperature measuring layer 13 may cover the larger region of the surface of the base body 11 and/or the surface of the heating layer 12 according to actual needs. Thus, the temperature may be measured for most regions of the base body 11 and/or most regions of the heating layer 12, effectively expanding the temperature measurement range of the heating assembly 10.

[0060] The above description is only some embodiments of the present disclosure, and are not intended to limit the scope of the present disclosure. Any equivalent structure or equivalent flow transformation made by using the contents of the specification and accompanying drawings of the present disclosure, or directly or indirectly applied to other related technical fields, is included in the scope of the patent protection of the present disclosure.

Claims

1. A heating assembly, comprising:

a base body, configured for accommodating an aerosol generating substrate;
a heating layer, disposed on a surface of the base body, wherein the heating layer is configured to heat and atomize the aerosol generating substrate in response to electrifying the heating layer; and
a temperature measuring layer, disposed on the surface of the base body and/or the heating layer, wherein the temperature measuring layer has the temperature coefficient of resistance characteristic.

2. The heating assembly according to claim 1, wherein the temperature measuring layer is disposed on a surface of the heating layer away from the base body.

3. The heating assembly according to claim 1, wherein the temperature measuring layer is disposed on the surface of the base body, and the temperature measuring layer and the heating layer are disposed on the same surface of the base body and spaced apart from each other.

4. The heating assembly according to claim 1, wherein the temperature measuring layer is disposed on the surface of the base body, and disposed between the base body and the heating layer.

5. The heating assembly according to claim 1, wherein the temperature measuring layer is disposed on the surface of the base body, and the temperature measuring layer and the heating layer are disposed on different surfaces of the base body.

6. The heating assembly according to claim 1, wherein the temperature measuring layer is disposed around the base body for one circle along the circumferential direction of the base body.

7. The heating assembly according to claim 1, wherein the temperature measuring layer is disposed on an end of the base body.

8. The heating assembly according to claim 1, wherein the temperature measuring layer is disposed in the middle of the base body and is distributed in a wave shape along the circumferential direction of the base body.

9. The heating assembly according to claim 1, wherein the temperature measuring layer at least covers a region of the heating assembly with the highest temperature.

10. The heating assembly according to claim 1, wherein the heating layer is an infrared heating film.

11. The heating assembly according to claim 1, wherein the base body is a hollow column, and the heating layer is disposed on the outer surface of the hollow column.

12. The heating assembly according to claim 1, wherein the base body is a hollow column, and the heating layer is disposed on the inner surface of the hollow column.

13. The heating assembly according to claim 11, wherein the heating layer and the temperature measuring layer are disposed on the outer surface of the base body by silk screen printing or coating, and the area of the temperature measuring layer is smaller than that of the heating layer.

14. The heating assembly according to claim 11, wherein the base body is a quartz.

15. An aerosol generating device, comprising:

a heating assembly according to claim 1, configured for heating and atomizing the aerosol generating substrate in response to electrifying the heating assembly;
a power supply assembly, configured for being connected to the heating assembly, and configured for supplying power to the heating assembly; and
a controller, configured for controlling the power supply assembly to supply power to the heating assembly, detect the resistance value of the temperature measuring layer in real time, and monitor the temperature of the heating assembly according to the resistance value.

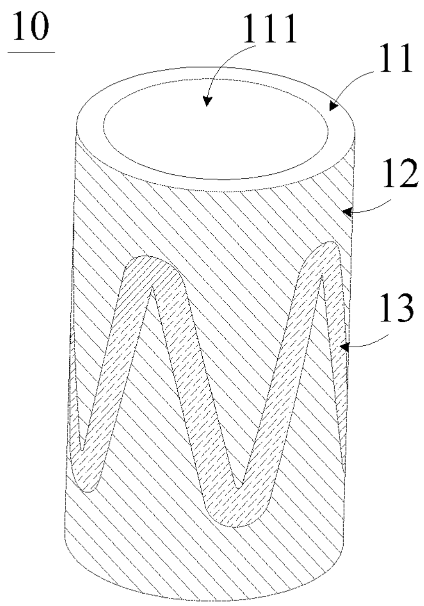

FIG. 1

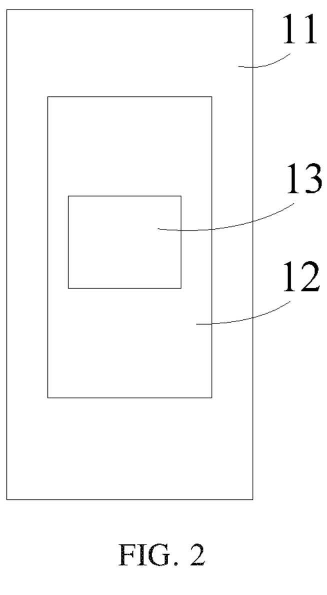

FIG. 2

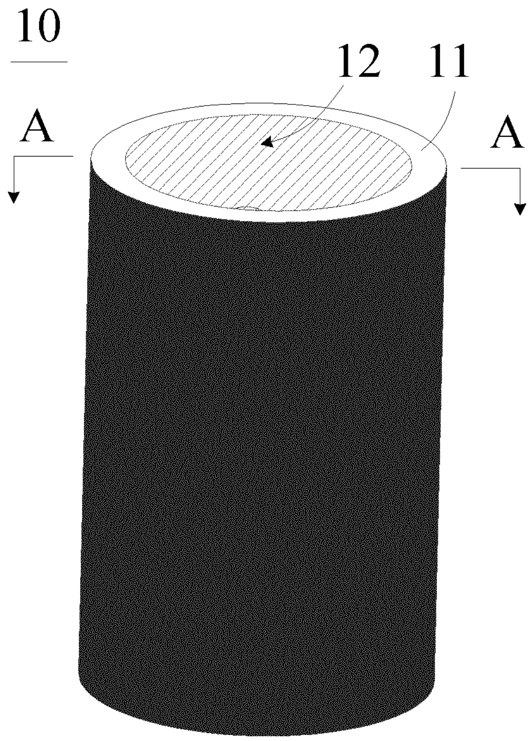

FIG. 3

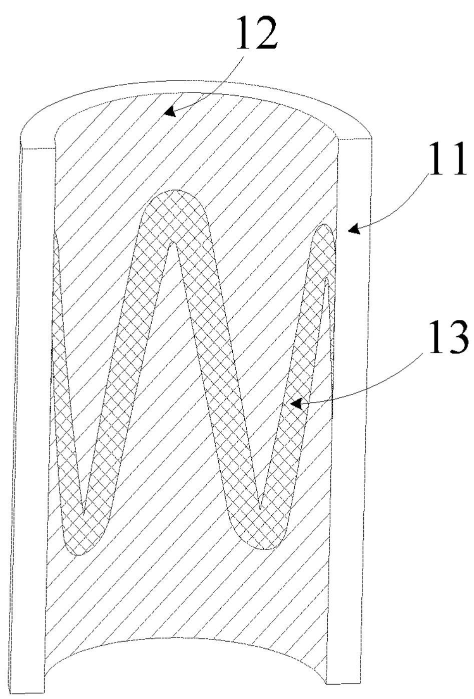

FIG. 4

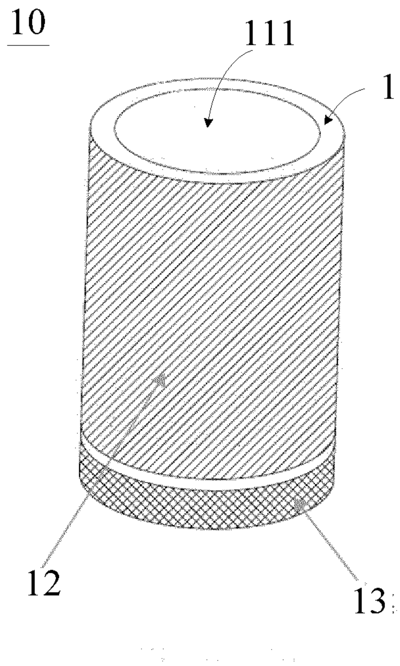

FIG. 5

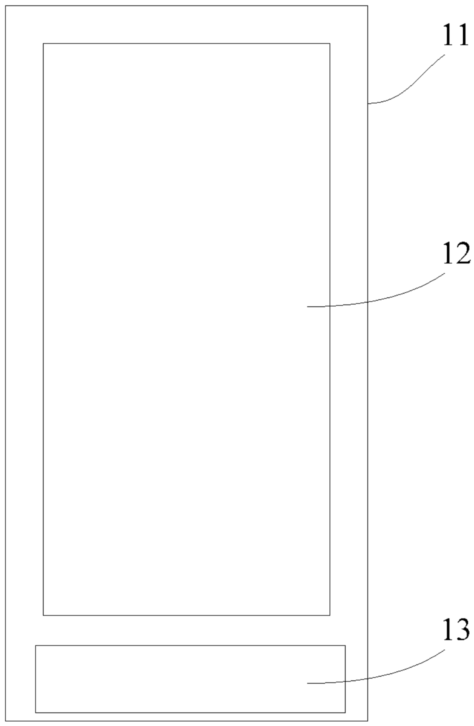

FIG. 6

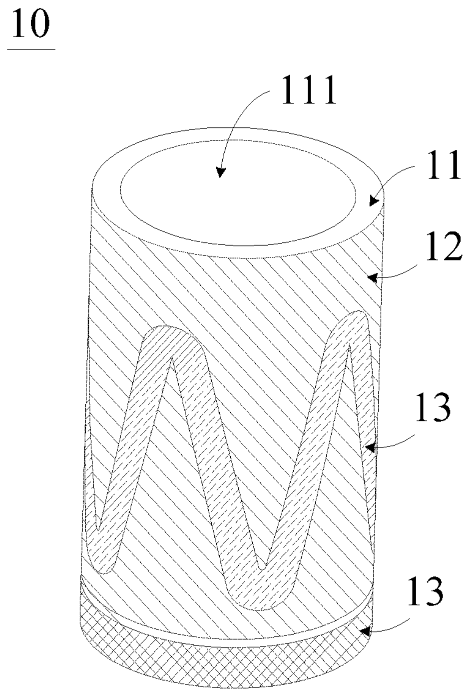

FIG. 7

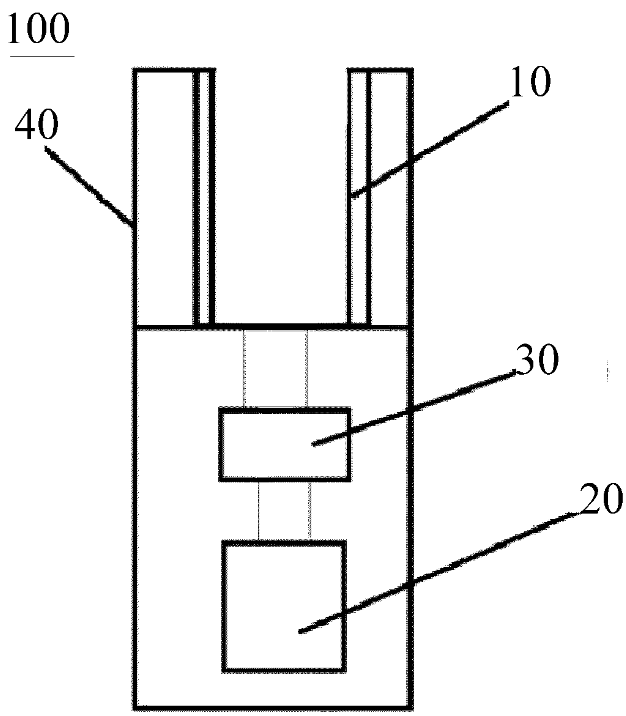

FIG. 8

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2022/128023

A. CLASSIFICATION OF SUBJECT MATTER

A24F 40/40(2020.01)i； A24F 40/46(2020.01)i； A24F 40/53(2020.01)i； A24F 40/50(2020.01)i； A24F 40/57(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 40； A24F 47

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)

WPABSC; CNTXT; WPABS; ENTXT; CJFD; DWPI; ENTXTC; VEN: TCR, 红外, infrared, 雾化, 加热, 电阻, 电热, 发热, 温度, 测温, heat+, atomiz+, temperature, nebulizat+, pulverizat+, resistance

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 114052298 A (SHENZHEN MAISHI TECHNOLOGY CO., LTD.) 18 February 2022 (2022-02-18) claims 1-15	1-15
X	CN 213604404 U (SHENZHEN FIRST UNION TECHNOLOGY CO., LTD.) 06 July 2021 (2021-07-06) description, paragraphs [0054]-[0060], [0064]-[0069], [0075], and [0097]-[0101], and figures 4-5 and 10	1-15
X	CN 213604400 U (SHENZHEN FIRST UNION TECHNOLOGY CO., LTD.) 06 July 2021 (2021-07-06) description, paragraphs [0030]-[0038] and [0043]-[0044], and figures 3-5	1-15
X	WO 2021233791 A1 (JT INTERNATIONAL SA) 25 November 2021 (2021-11-25) description, paragraphs [0045]-[0049] and [0065]-[0072], and figures 1-3	1-15
X	CN 112293804 A (SHENZHEN WOODY VAPES TECHNOLOGY CO., LTD.) 02 February 2021 (2021-02-02) description, paragraphs [0049]-[0053], [0057], and [0061]-[0064], and figures 1-6	1-15

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

* Special categories of cited documents:
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Date of the actual completion of the international search	Date of mailing of the international search report
23 December 2022	**11 January 2023**

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/CN2022/128023

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 112888327 A (KT&G CORP.) 01 June 2021 (2021-06-01) description, paragraphs [0041], [0047]-[0049], [0055]-[0058], and [0087]-[0088], and figures 1-2	1-15

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2022/128023

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
CN	114052298	A	18 February 2022	CN	217161071	U	12 August 2022
CN	213604404	U	06 July 2021	WO	2022002267	A	06 January 2022
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WO	2021233791	A1	25 November 2021	None			
CN	112293804	A	02 February 2021	CN	214483280	U	26 October 2021
				WO	2022095306	A1	12 May 2022
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				EP	3818852	A1	12 May 2021
				JP	2021532727	A	02 December 2021
				WO	2021015496	A1	28 January 2021
				EP	3818852	A4	19 January 2022
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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- CN 202111423299 **[0001]**