



(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

(43) Date of publication:
13.12.2023 Bulletin 2023/50

(21) Application number: **22748939.0**

(22) Date of filing: **24.01.2022**

(51) International Patent Classification (IPC):
A24F 47/00 ^(2020.01) **A24F 40/46** ^(2020.01)

(52) Cooperative Patent Classification (CPC):
A24F 40/10; A24F 40/40; A24F 40/42; A24F 40/46; A24F 47/00

(86) International application number:
PCT/CN2022/073540

(87) International publication number:
WO 2022/166660 (11.08.2022 Gazette 2022/32)

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

(30) Priority: **06.02.2021 CN 202110175680**

(71) Applicant: **Shenzhen First Union Technology Co., Ltd.**
Shenzhen, Guangdong 518000 (CN)

(72) Inventors:
• **ZHANG, Xiaofei**
Shenzhen, Guangdong 518000 (CN)
• **XU, Zhongli**
Shenzhen, Guangdong 518000 (CN)
• **LI, Yonghai**
Shenzhen, Guangdong 518000 (CN)

(74) Representative: **Proi World Intellectual Property GmbH**
Obermattweg 12
6052 Hergiswil, Kanton Nidwalden (CH)

(54) **ATOMIZER, RESISTIVE SLURRY, HEATING ASSEMBLY, AND AEROSOL GENERATION DEVICE**

(57) Disclosed in this application is a vaporizer, a resistor paste, a heating assembly and an aerosol generation device. The vaporizer includes: a liquid storage cavity, used for storing a liquid substrate; a porous body, being in fluid communication with the liquid storage cavity to suck the liquid substrate, the porous body including a vaporization face; and a resistance heating trajectory, formed on the vaporization face and used for heating at least part of the liquid substrate in the porous body to generate an aerosol, the resistance heating trajectory including an iron-silicon alloy. According to the above vaporizer, the resistance heating trajectory with the iron-silicon alloy as a functional phase is adopted to heat and vaporize the liquid substrate in the porous body to generate the aerosol, which not only has a suitable resistance temperature coefficient but also does not contain heavy metals.

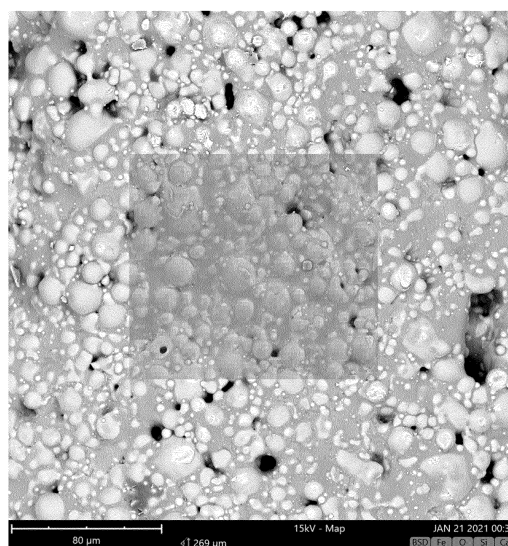


FIG. 4

Description**CROSS-REFERENCE TO RELATED APPLICATIONS**

5 **[0001]** This application claims the priority of the prior application No. 2021101756800 filed to the China National Intellectual Property Administration on February 6, 2021 and entitled "vaporizer, resistor paste, heating assembly and aerosol generation device", the content of which is incorporated herein by reference.

TECHNICAL FIELD

10 **[0002]** Embodiments of this application relate to the technical field of aerosol generation devices, and in particular, to a vaporizer, a resistor paste, a heating assembly and an aerosol generation device.

BACKGROUND

15 **[0003]** Tobacco products (e.g., cigarettes, cigars, etc.) burn tobacco in a using process to generate tobacco smoke. Attempts are made to replace these tobacco-burning products by manufacturing products that release compounds without burning.

20 **[0004]** Examples of such products are vaporization devices. These devices usually contain liquid, and the liquid is heated to be vaporized, so as to generate an inhalable vapor or aerosol. The liquid may contain nicotine, and/or aromatics, and/or aerosol generation substances (e.g., glycerin). A known vaporization device adopts a heating assembly to vaporize liquid, the heating assembly includes a porous base body sucking the liquid through capillary infiltration, and a resistance heating trajectory formed on the porous base body, and the liquid sucked by the porous base body is heated and vaporized by the resistance heating trajectory to generate an aerosol. The above resistance heating trajectory is usually prepared from nickel, chromium, tungsten, etc., and thus can be subjected to temperature measurement through a resistance temperature coefficient while heating. There is heavy metal pollution during use.

SUMMARY

30 **[0005]** Provided in an embodiment of this application is a vaporizer, used for vaporizing a liquid substrate to generate an aerosol for inhaling, and including:

- a liquid storage cavity, used for storing the liquid substrate;
- a porous body, being in fluid communication with the liquid storage cavity to suck the liquid substrate, the porous body including a vaporization face; and
- 35 a resistance heating trajectory, formed on the vaporization face and used for heating at least part of the liquid substrate in the porous body to generate the aerosol, the resistance heating trajectory including an iron-silicon alloy.

40 **[0006]** According to the above vaporizer, the resistance heating trajectory with the iron-silicon alloy as a functional phase is adopted to heat and vaporize the liquid substrate in the porous body to generate the aerosol, which not only has a suitable resistance temperature coefficient but also does not contain heavy metals.

[0007] In a preferred implementation, the resistance heating trajectory has a resistance temperature coefficient of from 900 to 3000 ppm/°C.

45 **[0008]** In a preferred implementation, a mass percentage of silicon in the iron-silicon alloy of the resistance heating trajectory ranges from 3% to 15%.

[0009] In a preferred implementation, the resistance heating trajectory does not contain any one of nickel, chromium or tungsten.

[0010] In a preferred implementation, a mass percentage of the iron-silicon alloy in the resistance heating trajectory ranges from 80% to 95%.

50 **[0011]** In a preferred implementation, the resistance heating trajectory further includes a glass phase component, the glass phase component including at least one of SiO₂, Al₂O₃, MgO, CaO or B₂O₃.

[0012] Further provided in another embodiment of this application is a heating assembly, including: an electrical insulation base body, and a resistance heating trajectory formed on the electrical insulation base body, the resistance heating trajectory including an iron-silicon alloy.

55 **[0013]** In a preferred implementation, the electric insulation base body includes a porous body. More preferably, the porous body includes a porous ceramic body.

[0014] Further provided in yet another embodiment of this application is a resistor paste, including:

an iron-silicon alloy;
 a glass phase component; and
 a liquid organic auxiliary, the liquid organic auxiliary including at least an organic solvent.

[0015] In a preferred implementation, the resistor paste includes: 70 to 90 wt% of the iron-silicon alloy, 4 to 14 wt% of the glass phase, and 5 to 20 wt% of the liquid organic auxiliary.

[0016] In a preferred implementation, the glass phase component includes at least one of SiO₂, Al₂O₃, MgO, CaO or B₂O₃.

[0017] In a preferred implementation, the resistor paste further includes a pore-forming agent. More preferably, a mass percentage of the pore-forming agent in the resistor paste is less than 1 wt%.

[0018] Further provided in still another embodiment of this application is an aerosol generation device, including a vaporizer vaporizing a liquid substrate to generate an aerosol, and a power supply assembly supplying power to the vaporizer, the vaporizer includes the vaporizer described above.

[0019] Further provided in still yet another embodiment of this application is an aerosol generation device, including:

a chamber, configured to receive an aerosol generation product; and
 a resistance heater, used for heating the aerosol generation product, the resistance heater including an electrical insulation substrate, and a resistance heating trajectory formed on the electrical insulation substrate, the resistance heating trajectory including an iron-silicon alloy.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020] The objective implementation, functional features and advantages of this application are further illustrated in conjunction with embodiments and with reference to accompanying drawings. One or more embodiments are exemplarily illustrated through the corresponding figures in the accompanying drawings, and the exemplary illustrations are not to be construed as limiting the embodiments. Elements in the accompanying drawings that have the same reference numerals are represented as similar elements, and unless otherwise particularly stated, the figures in the accompanying drawings are not drawn to scale.

FIG. 1 is a schematic structural diagram of an aerosol generation device provided by an embodiment of this application.

FIG. 2 is a schematic cross-sectional view of a vaporizer in FIG. 1 from a perspective.

FIG. 3 is a schematic structural diagram of a heating assembly in FIG. 2 from a perspective.

FIG. 4 is an electron microscope scanning image of part of a resistance heating trajectory of a heating assembly prepared by an implementation.

FIG. 5 is an energy spectrum graph of a site of the resistance heating trajectory of the heating assembly prepared by an implementation.

FIG. 6 is a schematic structural diagram of a vapor generation device provided by an embodiment of this application.

FIG. 7 is a schematic structural diagram of an embodiment of a resistance heater in FIG. 6.

DETAILED DESCRIPTION

[0021] It is to be understood that specific embodiments described herein are merely used to explain this application but are not intended to limit this application. For ease of understanding of this application, this application is illustrated below in more detail in conjunction with accompanying drawings and specific implementations. When an element is expressed as "being fixed to" another element, the element may be directly on the another element, or one or more intermediate elements may exist between the element and the another element. When one element is expressed as "being connected to" another element, the element may be directly connected to the another element, or one or more intermediate elements may exist between the element and the another element. Terms "upper", "lower", "left", "right", "inner", "outer", and similar expressions used in this description are merely used for illustrative purpose.

[0022] Unless otherwise defined, meanings of all technical and scientific terms used in this description are the same as that usually understood by a person skilled in the art to which this application belongs. The terms used in this description of this application are merely intended to describe the objectives of the specific implementations and are not intended to limit this application. A term "and/or" used in this description includes any or all combinations of one or more related listed items.

[0023] For ease of understanding of this application, this application is illustrated below in more detail in conjunction with accompanying drawings and specific implementations.

[0024] Provided in this application is an aerosol generation device. Reference can be made to FIG. 1, the aerosol

generation device includes a vaporizer 100 storing a liquid substrate and vaporizing it to generate an aerosol, and a power supply assembly 200 supplying power to the vaporizer 100.

[0025] In an optional implementation, as shown in FIG. 1, the power supply assembly 200 includes a receiving cavity 270 provided at an end in a length direction and used for receiving and accommodating at least part of the vaporizer 100. When the at least part of the vaporizer 100 is received and accommodated in the power supply assembly 200, the power supply assembly 200 is electrically connected with the vaporizer 100 to supply power to the vaporizer 100. In addition, the vaporizer 100 can be removed from the receiving cavity 270 for easy replacement and independent storage.

[0026] In FIG. 1, the vaporizer 100 includes:

a liquid storage cavity 12 used for storing a liquid substrate, and a heating assembly 30 sucking the liquid substrate and heating and vaporizing the liquid substrate to generate an aerosol.

[0027] Further specifically, FIG. 2 shows a schematic structural diagram of an embodiment of the vaporizer 100 in FIG. 1, and the vaporizer 100 includes:

a main housing 10;

a suction nozzle A, formed at an upper end of the main housing 10 and used for allowing a user to inhale the aerosol; a smoke output pipe 11, extending in a longitudinal direction of the main housing 10 and used for outputting the aerosol towards the suction nozzle A;

a liquid storage cavity 12, defined by the smoke output pipe 11 and an inner wall of the main housing 10 and used for storing the liquid substrate;

a heating assembly 30, an upper side of the heating assembly 30 being in fluid communication with the liquid storage cavity 12 in a longitudinal direction of the vaporizer 100, wherein as shown in arrow R1 in FIG. 2, the liquid substrate in the liquid storage cavity 12 flows towards the heating assembly 30 to be sucked; and the heating assembly 30 is provided with a vaporization face 310 facing away from the liquid storage cavity 12, and the vaporization face 310 is used for heating the liquid substrate and releasing the generated aerosol;

a vaporization chamber 22, defined by the vaporization face 310 and used for accommodating the released aerosol, wherein the vaporization chamber 22 is in airflow communication with the smoke output pipe 11 to output the aerosol to the smoke output pipe 11; and

an electrode column 21, used for supplying power to the heating assembly 30.

[0028] Further referring to FIG. 3, the specific structure of the heating assembly 30 includes:

a porous body 31, wherein in some implementations, the porous body 31 can be made of a rigid capillary structure such as porous ceramic, porous glass ceramic and porous glass; and in an implementation, a flat surface of the porous body 31 facing away from the liquid storage cavity 12 is configured as the vaporization face 310; and

a resistance heating trajectory 32, wherein in some implementations, the resistance heating trajectory 32 is formed on the vaporization face 310 in such a way that a conductive raw material powder is mixed with a printing auxiliary to form a resistor paste, and then the resistor paste is printed and then sintered, so that all or most of the surface of the resistance heating trajectory 32 is tightly coupled with the vaporization face 320.

[0029] In some other variant implementations, the porous body 31 can further have a flat plate shape, a concave shape with an upper surface facing the liquid storage cavity 12 provided with a cavity, an arched shape with one side of the liquid storage cavity 12 provided with an arched structure, etc.

[0030] In other preferred implementations, the resistance heating trajectory 32 is a patterned trajectory.

[0031] In other preferred implementations, the resistance heating trajectory 32 is formed in a stamped or printed manner.

[0032] In other preferred implementations, the resistance heating trajectory 32 is in a flat shape.

[0033] In other preferred implementations, the resistance heating trajectory 32 is a trajectory extending in a manner of meandering, detouring, etc.

[0034] In other preferred implementations, the resistance heating trajectory 32 has a thickness of 60 to 100 μm .

[0035] After assembly, the electrode column 21 abuts against two ends of the resistance heating trajectory 32 to form a conductive connection to supply power to the resistance heating trajectory 32.

[0036] Further provided in another embodiment of this application is a resistor paste for preparing the above resistance heating trajectory 32, including:

a functional phase: an iron-silicon alloy powder;

a glass phase: including at least one of oxides such as SiO_2 , Al_2O_3 , MgO , CaO and B_2O_3 ; and

a liquid organic auxiliary: used for assisting printing/stamping and sintering of the above functional phase and glass phase, wherein in an implementation, the liquid organic auxiliary includes at least an organic solvent, and can further enhance mixing of a thickener, a leveling agent, a surfactant, a dispersant, a thixotropic agent, etc., to improve and

assist performance of the paste.

[0037] For example, as for the liquid organic auxiliary, in an implementation:

the organic solvent, the thickener and the leveling agent make the mixed paste have appropriate fluidity and plasticity; usually, in an implementation, the organic solvent includes at least one of ether lipids such as ether alcohols such as propylene glycol monomethyl ether, lactate lipids, and methyl cellosolve acetate; the thickener and the leveling agent can adjust stability of the mixed paste, and usually dibutyl phthalate, dioctyl phthalate and the like are adopted as the thickener;

the dispersant makes the above functional phase and glass phase evenly dispersed in the paste; usually, polyethylene wax, paraffin and the like are adopted as the dispersant;

the surfactant is used for improving surface performance of the paste to eliminate bubbles and the like coming out of mixing and stirring; usually, polysiloxane, dimethyl silicone oil and the like are adopted as the surfactant; and the thixotropic agent improves anti-sagging performance of the paste, and usually hydrogenated castor oil, polyvinyl alcohol and the like can be adopted as the thixotropic agent.

[0038] In a preferred implementation, the resistor paste includes the following components in percentage by mass: 70% to 90% of the iron-silicon alloy powder, 4% to 14% of the glass phase, and 5% to 20% of the liquid organic auxiliary.

[0039] In a preferred implementation, the iron-silicon alloy powder and/or a powder of the glass phase added in the resistor paste as a particle size of between 0.1 and 200 μm , which is advantageous to uniform dispersion of the powders. In a preferred implementation, the particle size within the above range can be obtained by water quenching and ball milling of raw materials.

[0040] In a more preferred implementation, the resistor paste can further include: in percentage by mass, less than 1% of a pore-forming agent. In an implementation, the pore-forming agent can adopt cellulose, wood fibers, short carbon fibers, etc. In a sintering process, the pore-forming agent is burned or decomposed into a gas to escape, thus forming pores.

[0041] Further provided in this application is a method for preparing a heating assembly 30 from the above resistor paste, including:

S10, obtaining a porous body 31;
S20, forming a precursor of a resistance heating trajectory 32 on a surface of a vaporization face 310 of the porous body 31 by screen-printing or spraying the resistor paste; and
S30, sintering or heat-treating the porous body 31 with the precursor of the resistance heating trajectory 32 to solidify the precursor of the resistance heating trajectory 32 into the resistance heating trajectory 32.

[0042] In the process of sintering or heat treatment in step S30, a liquid organic auxiliary and a pore-forming agent will decompose and evaporate, and do not remain in the resistance heating trajectory 32. Usually, sintering or heat treatment is conducted in a sintering furnace device and the like at a temperature of from 900 to 1200°C. The sintering time is controlled between 20 to 90 min. Finally, a mass percentage of an iron-silicon alloy phase in the resistance heating trajectory 32 after sintering ranges from 80% to 95%.

[0043] Certainly, in a preferred implementation, in order to prevent the functional phase of an iron-silicon alloy from being oxidized in the sintering process, the sintering process is conducted in a reducing atmosphere.

[0044] In the resistance heating trajectory 32 formed after sintering, there are only a cured glass phase and the functional phase of the iron-silicon alloy, and during power supply, a liquid substrate sucked in the porous body 31 can be heated to generate an aerosol.

[0045] In a more preferred implementation, by adjusting the components of the functional phase, such as correspondingly and properly replenishing and increasing metal platinum/palladium with a high resistance temperature coefficient, and correspondingly adjusting the content of silicon in the iron-silicon alloy, such as controlling the mass percentage of silicon to 3% to 15%, a resistance temperature coefficient of the finally prepared resistance heating trajectory 32 is adjustable within an expected range, such as 900 to 3000 ppm/°C. Thus, during use, the temperature of the resistance heating trajectory 32 can be determined by detecting the resistance temperature coefficient of the resistance heating trajectory 32.

[0046] Further, in order to facilitate the demonstration of performance consistence and stability of the heating assembly prepared through the above method, the prepared heating assembly is illustrated below with examples and results through specific embodiments.

Embodiment 1**[0047]**

S10, obtaining a porous body 31 shown in FIG. 2 and FIG. 3 with an average porosity of 60%;
 S20, preparing a resistor paste, wherein the resistor paste includes 75 wt% of an iron-silicon alloy powder, 10 wt% of a glass phase, 1 wt% of a pore-forming agent, and 14 wt% of a liquid organic auxiliary; wherein the iron-silicon alloy powder includes 6.5 wt% of silicon, denoted as FeSi_{6.5}; the glass phase includes 63 wt% of silicon dioxide, 15 wt% of calcium oxide, and 22 wt% of aluminum oxide; the liquid organic auxiliary includes 35 wt% of terpineol, 15 wt% of butyl carbitol, 6 wt% of 1,4-butyrolactone, 24 wt% of tributyl citrate, 15 wt% of ethyl cellulose, and 5 wt% of hydrogenated castor oil; and particle sizes of the iron-silicon alloy powder and the glass phase are controlled to about 1 to 5 μm through sieving;
 S30, subjecting the resistor paste in step S20 to working procedures of stirring, triple roller grinding, filtering and debubbling, followed by screen printing on a vaporization face 310 of the porous body 31 to form a precursor of a resistance heating trajectory 32 in a shape in FIG. 3; and the printing thickness is 60 μm , and the printed circuit width of the trajectory is 0.35 mm; and
 S40, sintering the porous body 31 with the precursor of the resistance heating trajectory 32 after printing in step S30 in a sintering furnace with a reducing atmosphere; wherein sintering is conducted at a temperature of 1050°C for 30 min; and after sintering is completed, the heating assembly prepared in Embodiment 1 is taken out.

Embodiment 2**[0048]**

S10, obtaining a porous body 31 shown in FIG. 2 and FIG. 3 with an average porosity of 60%;
 S20, preparing a resistor paste, wherein the resistor paste includes 78 wt% of an iron-silicon alloy powder, 5 wt% of a glass phase, 1 wt% of a pore-forming agent, and 16 wt% of a liquid organic auxiliary; wherein the iron-silicon alloy powder includes 10 wt% of silicon, denoted as FeSi₁₀; the glass phase includes 63 wt% of silicon dioxide, 15 wt% of calcium oxide, and 22 wt% of aluminum oxide; the liquid organic auxiliary includes 35 wt% of terpineol, 15 wt% of butyl carbitol, 6 wt% of 1,4-butyrolactone, 24 wt% of tributyl citrate, 15 wt% of ethyl cellulose, and 5 wt% of hydrogenated castor oil; and particle sizes of the iron-silicon alloy powder and the glass phase are controlled to about 1 to 5 μm through sieving;
 S30, subjecting the resistor paste in step S20 to working procedures of stirring, triple roller grinding, filtering and debubbling, followed by screen printing on a vaporization face 310 of the porous body 31 to form a precursor of a resistance heating trajectory 32 in a shape in FIG. 3; and the printing thickness is 60 μm , and the printed circuit width of the trajectory is 0.35 mm; and
 S40, sintering the porous body 31 with the precursor of the resistance heating trajectory 32 after printing in step S30 in a sintering furnace with a reducing atmosphere; wherein sintering is conducted at a temperature of 1050°C for 30 min; and after sintering is completed, the heating assembly prepared in Embodiment 1 is taken out.

Embodiment 3

[0049] Embodiment 3 adopts the same method steps as Embodiment 1. In preparation of a resistor paste, 71 wt% of a functional phase of an iron-silicon alloy powder and 14 wt% of a glass phase are used for preparing a heating assembly of Embodiment 3.

Embodiment 4

[0050] Embodiment 4 adopts the same method steps as Embodiment 2. In preparation of a resistor paste, the content of silicon in the functional phase of the iron-silicon alloy powder is adjusted to 12 wt% to prepare a heating assembly of Embodiment 3.

Embodiment 5

[0051] Embodiment 5 adopts the same method steps as Embodiment 1. In preparation of a resistor paste, 88 wt% of an iron-silicon alloy powder, 5 wt% of a glass phase, and 7 wt% of a liquid organic auxiliary are used; wherein, the content of silicon in the functional phase of the iron-silicon alloy powder is 3.5 wt%; and a heating assembly of Embodiment 5 is prepared according to the above steps.

[0052] Various verifications are conducted on the above prepared heating assembly, and specifically include: S50, detecting resistance temperature coefficients, wherein the resistance temperature coefficients of the resistance heating trajectories 32 in the heating assemblies prepared in the above embodiments are measured, and results are shown in the following table:

	Functional phase	Resistance temperature coefficient (ppm/°C)
Embodiment 1	Iron-silicon alloy FeSi6.5	917
Embodiment 2	Iron-silicon alloy FeSi10	1245
Embodiment 3	Iron-silicon alloy FeSi12	964
Embodiment 4	Iron-silicon alloy FeSi15	848
Embodiment 5	Iron-silicon alloy FeSi3.5	2343

[0053] S60, conducting electron microscope scanning on the resistance heating trajectory 32 of the heating assembly sample prepared in Embodiment 2 to obtain micromorphology of the resistance heating trajectory 32, as shown in FIG. 4; and meanwhile, conducting energy spectrum analysis on a central site in FIG. 4 to obtain an energy spectrum graph, as shown in FIG. 5.

[0054] Further, proportions of element components obtained by energy spectrum analysis in FIG. 5 are shown in the following table:

Element	Percentage by atom number/%	Percentage by weight %
Fe	38.65	61.54
O	32.19	14.68
Si	27.94	22.37
Ca	1.23	1.40

[0055] Among the proportions of the elements of energy spectrum analysis reflected in FIG. 5 and the above table, also mainly iron and silicon; and among the percentages of the above elements, the glass phase provides part of silicon oxide, thus the content of the silicon element at the analysis site is greater than the content of silicon described in the functional phase, but the functions are still provided by the iron-silicon alloy. In addition, it can be seen from a color distinction in FIG. 4 that the functional element components in a measured area are all iron and silicon.

[0056] Further provided in yet another embodiment of this application is a vapor generation device, with a structure shown in FIG. 4, including:

- a chamber, used for receiving a solid aerosol generation product A;
- a resistance heater 30a, at least partially extending in the chamber to heat the aerosol generation product A to generate an aerosol for inhaling;
- a battery cell 10a, used for supplying power; and
- a controller 20a, guiding a current between the battery cell 10a and the resistance heater 30a.

[0057] Referring to FIG. 5 for a structure of the resistance heater 30a, including:

- an electrical insulation substrate 31a, wherein the electrical insulation substrate 31a can be made of materials, such as ceramic, rigid plastic, a surface insulation metal and polyimide; preferably, the electrical insulation substrate 31a is in a shape of a rigid pin or a thin blade, which can be inserted into the aerosol generation product A during use to heat the aerosol generation product A; or in other variant implementations, the electrical insulation substrate 31a can further in a tubular shape surrounding the chamber/the aerosol generation product A; and
- a resistance heating trajectory 32a, coupled to the electrical insulation substrate 31a in a printed or deposited manner; wherein the resistance heating trajectory 32a is prepared from the above resistor paste with the iron-silicon alloy as the functional phase. During use, the resistance heating trajectory 32a does not contain heavy metals such as nickel/chromium/tungsten, and meanwhile can have a resistance temperature coefficient of from 900 to 3000 ppm/°C, so that the temperature of the resistance heater 30a can be measured through.

[0058] Preferred embodiments of this application are given in the description of this application and the accompanying drawings thereof. However, this application may be implemented in various different forms, and is not limited to the embodiments described in this description. These embodiments are not intended to be an additional limitation on the content of this application, and are described for the purpose of providing a more thorough and comprehensive understanding of the content disclosed in this application. Moreover, the foregoing technical features are further combined with each other to form various embodiments not listed above, and all such embodiments shall be construed as falling within the scope of the description of this application. Further, a person of ordinary skill in the art may make improvements or modifications according to the foregoing illustrations, and all the improvements and modifications shall fall within the protection scope of the appended claims of this application.

Claims

1. A vaporizer, used for vaporizing a liquid substrate to generate an aerosol for inhaling, and comprising:
 - a liquid storage cavity, used for storing the liquid substrate;
 - a porous body, being in fluid communication with the liquid storage cavity to suck the liquid substrate, the porous body comprising a vaporization face; and
 - a resistance heating trajectory, formed on the vaporization face and used for heating at least part of the liquid substrate in the porous body to generate the aerosol, the resistance heating trajectory comprising an iron-silicon alloy.
2. The vaporizer according to claim 1, wherein the resistance heating trajectory has a resistance temperature coefficient of from 900 to 3000 ppm/°C.
3. The vaporizer according to claim 1 or 2, wherein a mass percentage of silicon in the iron-silicon alloy of the resistance heating trajectory ranges from 3% to 15%.
4. The vaporizer according to claim 1 or 2, wherein the resistance heating trajectory does not contain any one of nickel, chromium or tungsten.
5. The vaporizer according to claim 1 or 2, wherein a mass percentage of the iron-silicon alloy in the resistance heating trajectory ranges from 80% to 95%.
6. The vaporizer according to claim 5, wherein the resistance heating trajectory further comprises a glass phase component, the glass phase component comprising at least one of SiO₂, Al₂O₃, MgO, CaO or B₂O₃.
7. A resistor paste, comprising:
 - an iron-silicon alloy;
 - a glass phase component; and
 - a liquid organic auxiliary, the liquid organic auxiliary comprising at least an organic solvent.
8. The resistor paste according to claim 7, comprising: 70 to 90 wt% of the iron-silicon alloy, 4 to 14 wt% of the glass phase, and 5 to 20 wt% of the liquid organic auxiliary.
9. The resistor paste according to claim 7 or 8, wherein the glass phase component comprises at least one of SiO₂, Al₂O₃, MgO, CaO or B₂O₃.
10. A heating assembly, comprising:
 - an electrical insulation base body, and a resistance heating trajectory formed on the electrical insulation base body, the resistance heating trajectory comprising an iron-silicon alloy.
11. The heating assembly according to claim 10, wherein the electrical insulation base body comprises a porous body.
12. An aerosol generation device, comprising a vaporizer vaporizing a liquid substrate to generate an aerosol, and a power supply assembly supplying power to the vaporizer, wherein the vaporizer comprises the vaporizer according to any one of claims 1-6.

13. An aerosol generation device, comprising:

a chamber, configured to receive an aerosol generation product; and
a resistance heater, used for heating the aerosol generation product, the resistance heater comprising an
electrical insulation substrate, and a resistance heating trajectory formed on the electrical insulation substrate,
and the resistance heating trajectory comprising an iron-silicon alloy.

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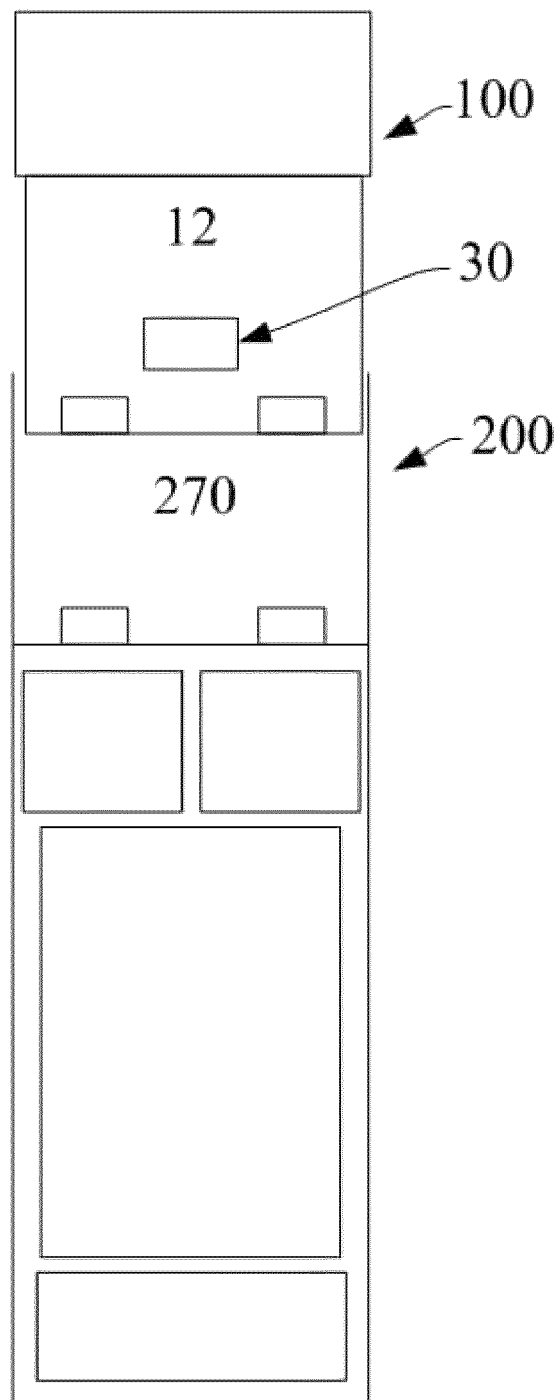


FIG. 1

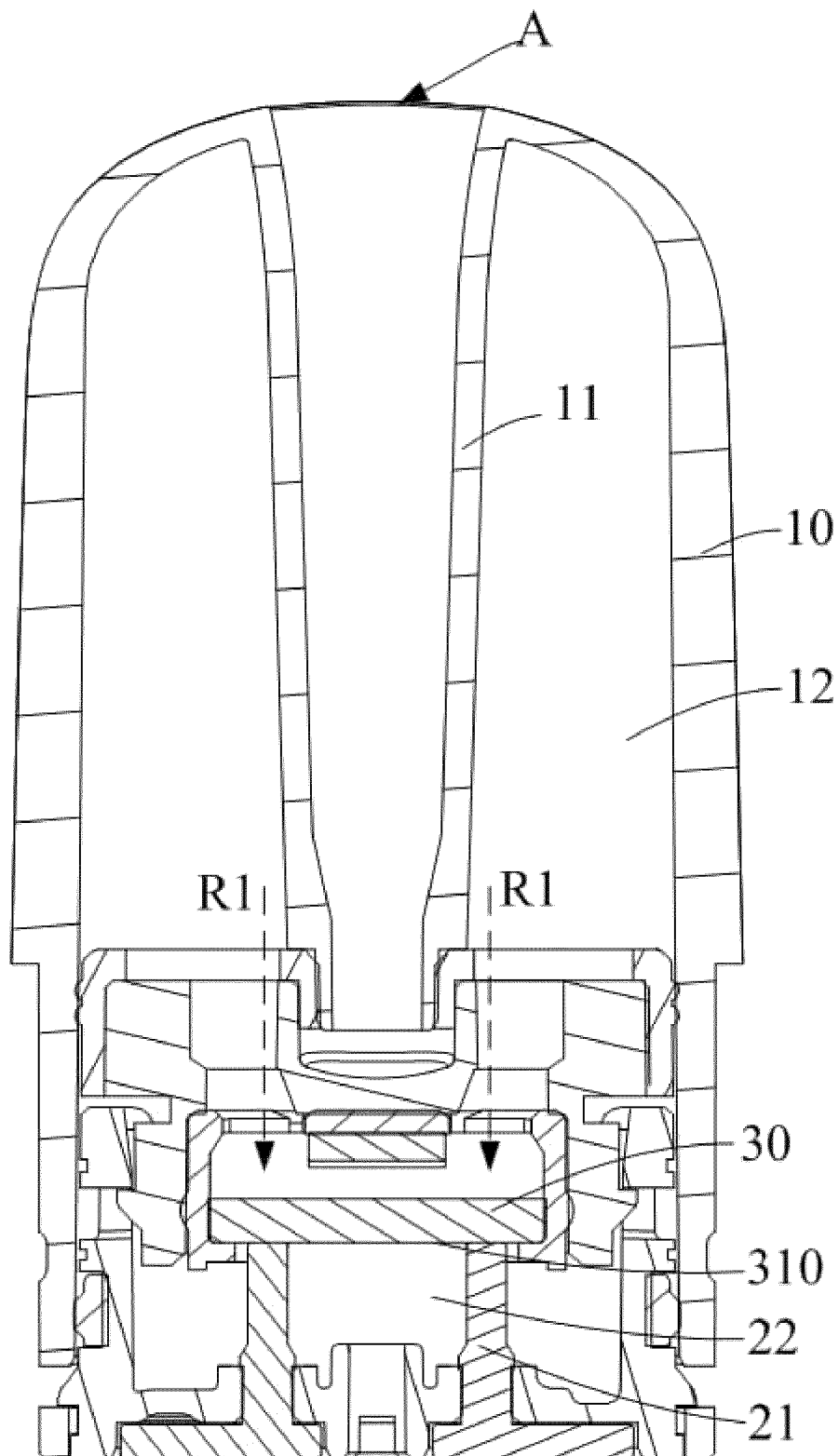


FIG. 2

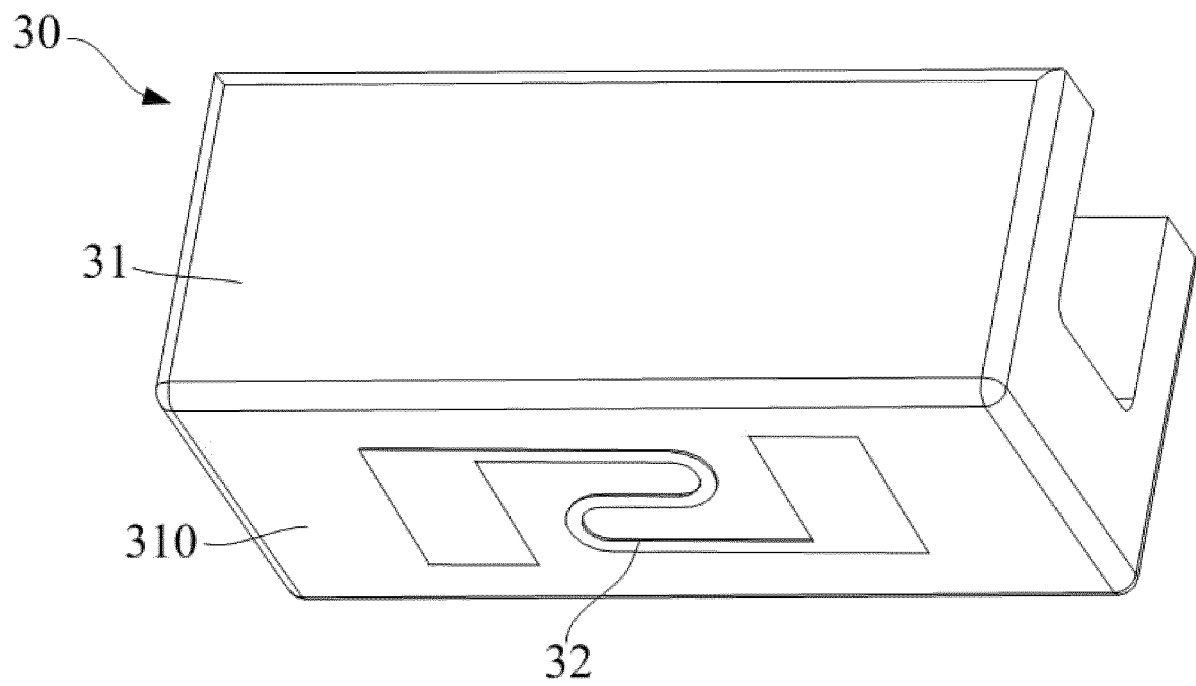


FIG. 3

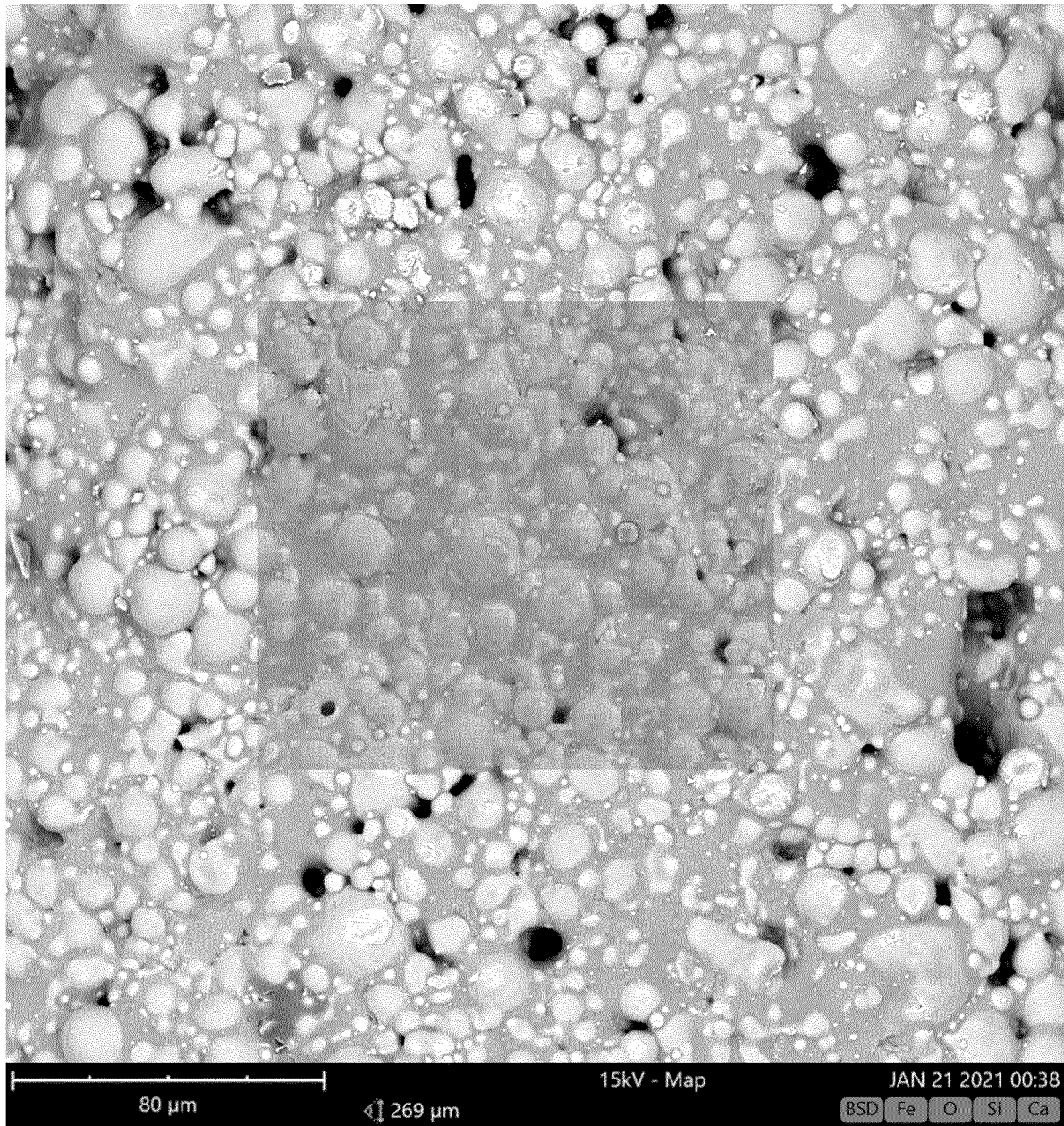


FIG. 4

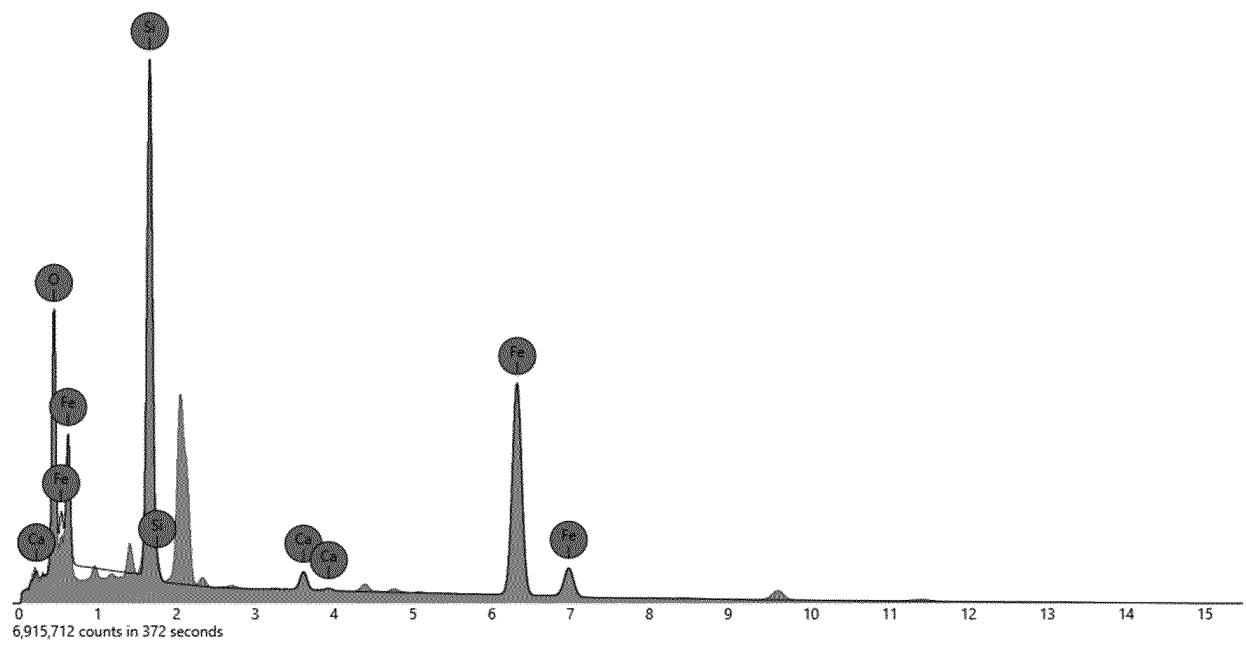


FIG. 5

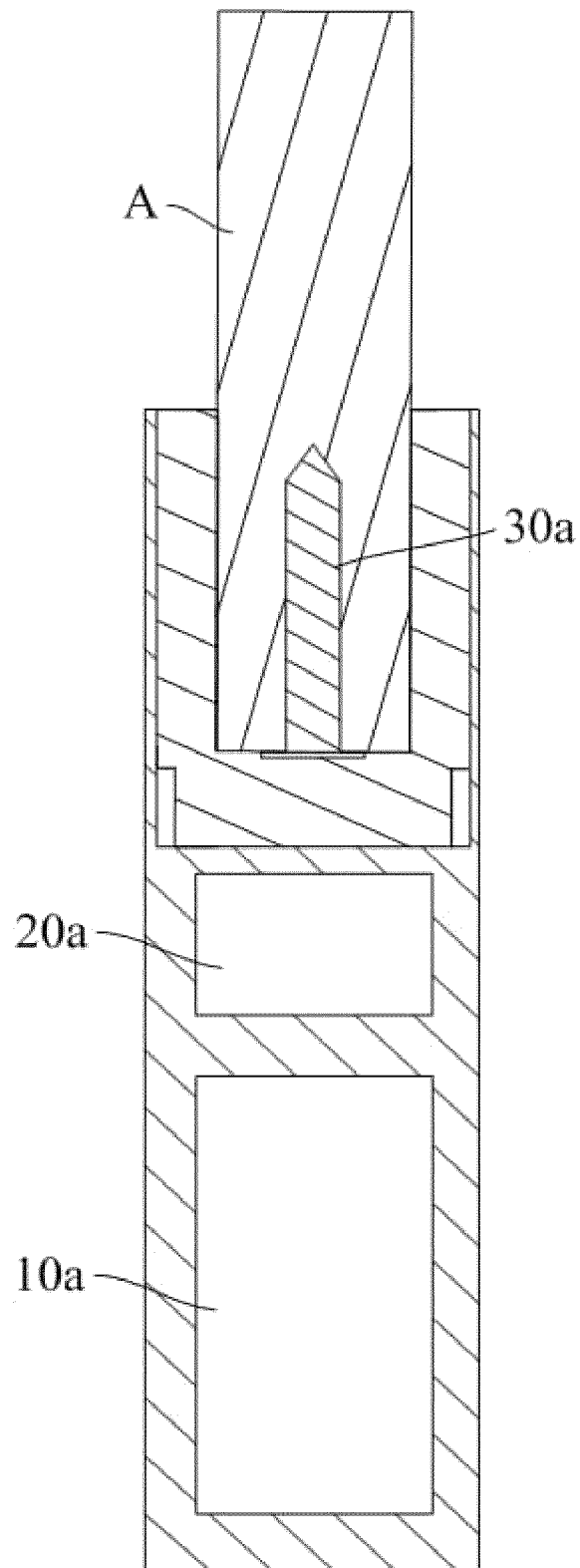


FIG. 6

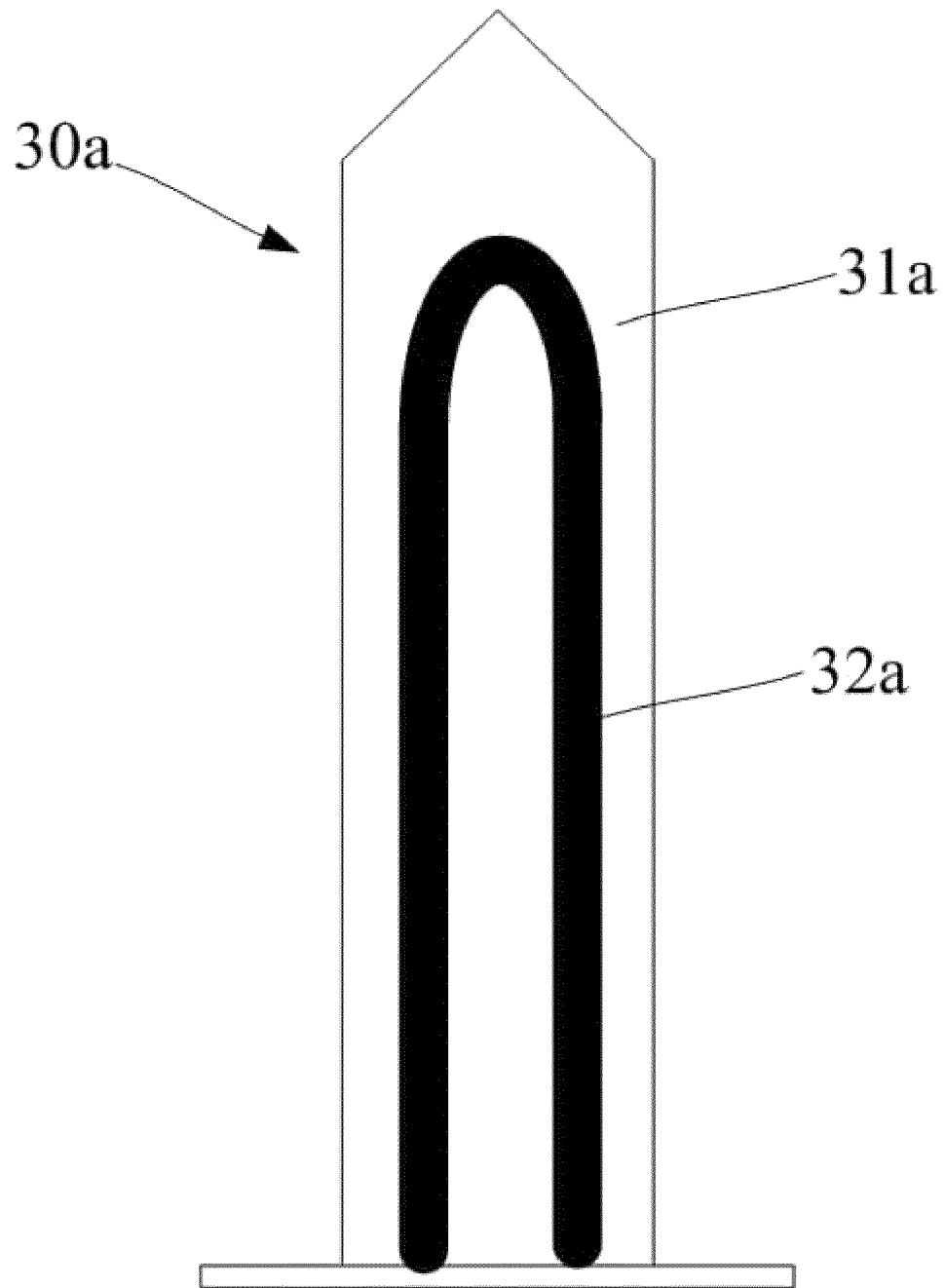


FIG. 7

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2022/073540

A. CLASSIFICATION OF SUBJECT MATTER A24F 47/00(2020.01)i; A24F 40/46(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) A24F47/-; A24F40/- Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched																					
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) CNTXT; CNABS; WPABS; VEN; WEB OF KNOWLEDGE: 电子烟, 雾化器, 电阻浆料, 加热组件, 气溶胶, 储液腔, 多孔体, 雾化面, 加热轨迹, 铁硅合金; Electronic cigarettes, atomizers, resistive pastes, heating components, aerosols, liquid storage chambers, porous bodies, atomizing surfaces, heating tracks, iron-silicon alloys																					
C. DOCUMENTS CONSIDERED TO BE RELEVANT <table border="1"> <thead> <tr> <th>Category*</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>PX</td> <td>CN 212590295 U (SHENZHEN FIRST UNION TECHNOLOGY CO., LTD.) 26 February 2021 (2021-02-26) description, paragraphs 60-117</td> <td>1-6, 10-13</td> </tr> <tr> <td>PX</td> <td>CN 215303022 U (SHENZHEN HUACHENGDA PRECISION INDUSTRY CO., LTD.) 28 December 2021 (2021-12-28) description, paragraphs 57-95</td> <td>1-6, 10-13</td> </tr> <tr> <td>PX</td> <td>CN 112790427 A (SHENZHEN FIRST UNION TECHNOLOGY CO., LTD.) 14 May 2021 (2021-05-14) description, paragraphs 38-91</td> <td>1-6, 10-13</td> </tr> <tr> <td>X</td> <td>CN 209498585 U (SHENZHEN FIRST UNION TECHNOLOGY CO., LTD.) 18 October 2019 (2019-10-18) description, paragraphs 38-68</td> <td>1-6, 10-13</td> </tr> <tr> <td>X</td> <td>CN 109414062 A (JAPAN TOBACCO INC.) 01 March 2019 (2019-03-01) description, paragraphs 54-139</td> <td>1-6, 10-13</td> </tr> <tr> <td>X</td> <td>CN 109619697 A (ALD GROUP LIMITED) 16 April 2019 (2019-04-16) description, paragraphs 19-44</td> <td>1-6, 10-13</td> </tr> </tbody> </table>	Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	PX	CN 212590295 U (SHENZHEN FIRST UNION TECHNOLOGY CO., LTD.) 26 February 2021 (2021-02-26) description, paragraphs 60-117	1-6, 10-13	PX	CN 215303022 U (SHENZHEN HUACHENGDA PRECISION INDUSTRY CO., LTD.) 28 December 2021 (2021-12-28) description, paragraphs 57-95	1-6, 10-13	PX	CN 112790427 A (SHENZHEN FIRST UNION TECHNOLOGY CO., LTD.) 14 May 2021 (2021-05-14) description, paragraphs 38-91	1-6, 10-13	X	CN 209498585 U (SHENZHEN FIRST UNION TECHNOLOGY CO., LTD.) 18 October 2019 (2019-10-18) description, paragraphs 38-68	1-6, 10-13	X	CN 109414062 A (JAPAN TOBACCO INC.) 01 March 2019 (2019-03-01) description, paragraphs 54-139	1-6, 10-13	X	CN 109619697 A (ALD GROUP LIMITED) 16 April 2019 (2019-04-16) description, paragraphs 19-44	1-6, 10-13
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☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.																					
<table border="1"> <tr> <td> * Special categories of cited documents: “A” document defining the general state of the art which is not considered to be of particular relevance “E” earlier application or patent but published on or after the international filing date “L” document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) “O” document referring to an oral disclosure, use, exhibition or other means “P” document published prior to the international filing date but later than the priority date claimed </td> <td> “T” later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention “X” document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone “Y” document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art “&” document member of the same patent family </td> </tr> <tr> <td>Date of the actual completion of the international search 19 April 2022</td> <td>Date of mailing of the international search report 28 April 2022</td> </tr> <tr> <td>Name and mailing address of the ISA/CN China National Intellectual Property Administration (ISA/CN) No. 6, Xitucheng Road, Jimenqiao, Haidian District, Beijing 100088, China Facsimile No. (86-10)62019451</td> <td>Authorized officer Telephone No.</td> </tr> </table>	* Special categories of cited documents: “A” document defining the general state of the art which is not considered to be of particular relevance “E” earlier application or patent but published on or after the international filing date “L” document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) “O” document referring to an oral disclosure, use, exhibition or other means “P” document published prior to the international filing date but later than the priority date claimed	“T” later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention “X” document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone “Y” document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art “&” document member of the same patent family	Date of the actual completion of the international search 19 April 2022	Date of mailing of the international search report 28 April 2022	Name and mailing address of the ISA/CN China National Intellectual Property Administration (ISA/CN) No. 6, Xitucheng Road, Jimenqiao, Haidian District, Beijing 100088, China Facsimile No. (86-10)62019451	Authorized officer Telephone No.															
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INTERNATIONAL SEARCH REPORT

International application No.
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