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(54) **AEROSOL-GENERATION ARTICLE, ELECTRONIC VAPORIZER, AND VAPORIZATION SYSTEM**

(57) The present invention relates to an aerosol-generation article, an electronic vaporizer, and a vaporization system. The aerosol-generation article includes an aerosol-generation substrate, where the aerosol-generation substrate is a solid substrate, and the aerosol-generation

article can generate heat under the action of an alternating electric field to form aerosols through vaporization. The aerosol-generation article generates heat by itself and tastes good.

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Description

TECHNICAL FIELD

[0001] The present invention relates to the field of vaporization technologies, and in particular, to an aerosol-generation article, an electronic vaporizer, and a vaporization system.

BACKGROUND

[0002] An electronic vaporizer is a device that mainly heats an aerosol-generation article to form aerosols. A heat-not-burn (HNB) electronic vaporizer can bake an aerosol-generation article at a low temperature (not greater than 450°C) to generate aerosols without a large amount of harmful substances brought by high-temperature pyrolysis, so that the HNB electronic vaporizer is adored by people.

[0003] Heating methods used in a conventional HNB electronic vaporizer includes a contact heating technology. That is, an external heat source (a sheet-shaped heat generation body, a pin-shaped heat generation body, or an electromagnetic induction heat generation body) of an aerosol-generation article conducts heat to the aerosol-generation article, and the aerosol-generation article vaporizes effective components in the aerosol-generation article after the heat is absorbed to generate aerosols. However, residues generated during heat generation are easily adhered to a heating body of an electronic vaporizer based on the conventional contact heating technology, which is hard to clean and easily affects the inhalation taste.

SUMMARY

[0004] According to various embodiments, an aerosol-generation article, an electronic vaporizer, and a vaporization system are provided.

[0005] An aerosol-generation article is provided, including an aerosol-generation substrate. The aerosol-generation substrate is a solid substrate; and the aerosol-generation article may generate heat under the action of an alternating electric field to form aerosols through vaporization.

[0006] The aerosol-generation article includes the aerosol-generation substrate, and the aerosol-generation substrate is a solid substrate. The aerosol-generation article can generate heat under the action of an alternating electric field to form aerosols through vaporization, and the aerosol-generation article has a high heating speed. In addition, since the matching electronic vaporizer does not need to be provided with a heating body, residues deposited on the heating body can be prevented from affecting the inhalation taste, and use of the electronic vaporizer is more convenient.

[0007] In an embodiment, the aerosol-generation substrate includes polar molecules.

[0008] In an embodiment, the polar molecules are at least one selected from the group consisting of water, alcohols, aldehydes, ketones, lipids, phenols, terpenoids, low-grade fatty acids, and any combination thereof.

[0009] In an embodiment, a frequency of the alternating electric field ranges from 10 MHz to 5 GHz.

[0010] In an embodiment, the aerosol-generation article further includes a heating-assisting material close to the aerosol-generation substrate.

[0011] In an embodiment, under the action of the alternating electric field, a dielectric loss factor of the heating-assisting material is greater than a dielectric loss factor of the aerosol-generation substrate.

[0012] In an embodiment, the heating-assisting material is an attenuation ceramic.

[0013] In an embodiment, water content in the aerosol-generation substrate ranges from 6wt% to 18wt%.

[0014] In an embodiment, the water content in the aerosol-generation substrate ranges from 8wt% to 14wt%.

[0015] An electronic vaporizer is provided, including a power source module and an alternating electric field generation module. The power source module supplies power to the alternating electric field generation module.

The alternating electric field generation module is configured to generate an alternating electric field causing the aerosol-generation substrate of the foregoing aerosol-generation article to generate heat to form aerosols.

[0016] In an embodiment, a frequency of the alternating electric field ranges from 10 MHz to 5 GHz.

[0017] In an embodiment, a waveform of an alternating voltage generating the alternating electric field is a sine wave, a square wave, or a sawtooth wave.

[0018] In an embodiment, the alternating electric field generation module includes an alternating voltage generator, a first electrode, and a second electrode. The alternating voltage generator provides an alternating voltage for the first electrode and the second electrode, to form the alternating electric field between the first electrode and the second electrode; and an accommodating space for accommodating the aerosol-generation substrate is provided in at least some regions on which the alternating electric field is distributed.

[0019] In an embodiment, the first electrode is in a shape of a plate or a cylinder; and the second electrode is in a shape of a plate or a cylinder.

[0020] In an embodiment, a plurality of first electrodes are arranged at intervals, and a plurality of second electrodes are arranged at intervals. The alternating voltage generator is configured to provide an alternating voltage for the plurality of first electrodes and the corresponding second electrodes according to a preset mode.

[0021] In an embodiment, the preset mode is to perform segmented heating with different powers or perform sequential segmented heating.

[0022] In an embodiment, the electronic vaporizer further includes an electromagnetic shielding member. The electromagnetic shielding member is configured to shield

or attenuate an overflowed electromagnetic field excited by the alternating electric field.

[0023] In an embodiment, the electronic vaporizer further includes a temperature sensor and a controller. The temperature sensor is configured to feed back a temperature of the aerosol-generation substrate to the controller, and the controller is configured to control an output of the alternating voltage generator according to the temperature fed back by the temperature sensor, to control a heat generation temperature of the aerosol-generation substrate.

[0024] A vaporization system is provided, including the foregoing aerosol-generation article and the foregoing electronic vaporizer adapted to the aerosol-generation article.

BRIEF DESCRIPTION OF THE DRAWINGS

[0025]

FIG. 1 is a schematic diagram of a vaporization system according to an embodiment;

FIG. 2 is a schematic cross-sectional view of an equivalent capacitor of the vaporization system shown in FIG. 1;

FIG. 3 is a schematic cross-sectional view of an equivalent capacitor according to another embodiment;

FIG. 4 is a schematic cross-sectional view of an equivalent capacitor and an electromagnetic shielding member according to another embodiment;

FIG. 5 is a schematic cross-sectional view of an equivalent capacitor and an electromagnetic shielding member according to another embodiment;

FIG. 6 is a schematic diagram of a plurality of equivalent capacitors according to another embodiment;

FIG. 7 is a schematic diagram of an equivalent capacitor according to another embodiment; and

FIG. 8 is a schematic diagram of a plurality of equivalent capacitors according to another embodiment.

[0026] List of Reference Numerals:

10: Vaporization system; 100: Aerosol-generation article; 110: Aerosol-generation substrate; 120: first temperature sensor; 200: Electronic vaporizer; 210: First electrode; 220: Second electrode; and 230: Electromagnetic shielding member.

DETAILED DESCRIPTION

[0027] For ease of understanding the present invention, the present invention is described more comprehensively below. The present invention may be implemented in many different forms, and is not limited to embodiments described in this specification. On the contrary, the embodiments are provided to make the disclosed content of the present invention clearer and more comprehensive.

[0028] It should be noted that, 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 an 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. Orientation or position relationships indicated by terms such as "vertical", "horizontal", "left", "right", "upper", "lower", "inner", "outer", and "bottom" are based on orientation or position relationships shown in the accompanying drawings, and are used only for ease of description, rather than indicating or implying that the mentioned apparatus or element must have a particular orientation or must be constructed and operated in a particular orientation. Therefore, such terms should not be construed as a limitation to the present invention. In addition, terms "first" and "second" are merely used for description and should not be understood as indicating or implying relative importance.

[0029] Unless otherwise defined, meanings of all technical and scientific terms used in this specification are the same as that usually understood by a person skilled in the technical field to which the present invention belongs. In this specification, terms used in this specification of the present invention are merely intended to describe objectives of the specific embodiments, but are not intended to limit the present invention.

[0030] In an embodiment of the preset invention, an aerosol-generation article is provided. The above aerosol-generation article generates heat when the aerosol-generation article matches an electronic vaporizer generating an alternating electric field. In this case, the electronic vaporizer does not need to be provided with a heat generation body, thereby preventing residues deposited on the heat generation body from affecting the inhalation taste, and use of the electronic vaporizer is more convenient since the heat generation body does not need to be cleaned.

[0031] In an embodiment of the preset invention, an electronic vaporizer and a vaporization system that are convenient to use and can improve the inhalation taste of the aerosol-generation article are further provided.

[0032] Referring to FIG. 1 and FIG. 2, an implementation of the present invention provides a vaporization system 10. The vaporization system 10 includes an aerosol-generation article 100 and an electronic vaporizer 200 adapted to the aerosol-generation article 100.

[0033] The aerosol-generation article 100 can generate heat under the action of an alternating electric field generated by the electronic vaporizer 200 to form aerosols through vaporization. The aerosols are solid particles or suspended droplets in gas (for example, air).

[0034] Specifically, the aerosol-generation article 100 includes a packaging layer (not shown in the figure) and an aerosol-generation substrate 110.

[0035] The packaging layer is used as outer packaging

and is configured to wrap other components (for example, the aerosol-generation substrate 110) of the aerosol-generation article 100 in the packaging layer. In some embodiments, the packaging layer is at least one of packaging paper or plastic. In some embodiments, the aerosol-generation article 100 is in a shape of a column. Correspondingly, the packaging layer is in a shape of a cylinder (for example, a barrel). In an embodiment, the aerosol-generation article is in a shape of a column, and the aerosol-generation article 100 includes the aerosol-generation substrate, a hollow tubular element, and a suction nozzle member that are sequentially arranged on a central axis of the packaging layer and defined by the packaging layer. The hollow tubular element is arranged between the aerosol-generation substrate and the suction nozzle member and is configured to extend a distance from the aerosols to the suction nozzle member, so as to play a role in buffering. In some embodiments, a cooling element configured to cool the aerosols is further arranged in the hollow tubular element. In an embodiment, a filtering material (for example, acetate fiber) is further arranged in the suction nozzle member. In an embodiment, an aerosol cooling element is further arranged between the hollow tubular element and the suction nozzle member, to prevent the aerosols from being too hot. It may be understood that, in some embodiments, the aerosol-generation article 100 is the aerosol-generation substrate 110. That is, in this case, the aerosol-generation article 100 omits the packaging layer, the hollow tubular element, the suction nozzle member, and the cooling element. It may be understood that, in some implementations, some of the above elements may alternatively be included.

[0036] In some embodiments, the aerosol-generation substrate 110 can generate heat under the action of the alternating electric field to form aerosols through vaporization. The aerosol-generation substrate 110 has complex components. At the molecular level, the ordering of molecules included in the aerosol-generation substrate 110 in a natural state is disordered. Because a dipole moment of each polar molecule is not zero, polar molecules in the aerosol-generation substrate 110 are subjected to an electric field force under the action of the electric field and then rotate; and under the action of the alternating electric field at a specific frequency, the polar molecules rotate or vibrate, and friction and/or collision occurs among the molecules to generate heat. Therefore, alternating electric field heating is to place a medium in an alternating electric field at a specific frequency, polar molecules in the medium rotate or vibrate at a high speed under the action of the alternating electric field, so that friction and/or collision occurs, and the medium generates heat. The frequency of the alternating electric field causing the medium to generate heat is related to properties of the medium, so that the alternating electric field heating may be performed selectively. Under the action of the alternating electric field, the aerosol-generation substrate 110 generates heat at a high speed and uni-

formly, so that the utilization of the aerosol-generation substrate 110 is high. In addition, because the aerosol-generation substrate 110 can generate heat by its own from inside to vaporize the aerosol-generation substrate to form aerosols, the matching electronic vaporizer 200 does not need to be provided with a heat generation body, such that residues deposited on the heat generation body can be prevented from affecting the inhalation taste, and use of the electronic vaporizer 200 is more convenient.

[0037] Specifically, the aerosol-generation substrate 110 includes polar molecules. In some embodiments, the polar molecules are at least one of water, alcohols, aldehydes, ketones, lipids, phenols, terpenoids, or low-grade fatty acids. Water is a polar molecule having a good polarity. When the content of water in the aerosol-generation substrate 110 is relatively great, water may be used as a heat generation substance to cause the aerosol-generation substrate 110 to form aerosols through vaporization. In an embodiment, water content in the aerosol-generation substrate 110 ranges from 6wt% to 18wt%. Further, the water content in the aerosol-generation substrate 110 ranges from 8wt% to 14wt%. Alcohols, aldehydes, ketones, lipids, phenols, terpenoids, and low-grade fatty acids have polarities and may be heated by an alternating electric field at an appropriate frequency. In some embodiments, at least one of alcohols, aldehydes, ketones, lipids, phenols, terpenoids, or low-grade fatty acids is mainly used as a flavor substance, but content of the alcohols, aldehydes, ketones, lipids, phenols, terpenoids, or low-grade fatty acids used as the flavor substance is generally relatively small, which cannot be independently used for heat generation or cannot achieve an apparent heat generation effect, and need to match other polar molecules (for example, water) to generate heat. It may be understood that, in some embodiments, at least one of alcohols, aldehydes, ketones, lipids, phenols, terpenoids, or low-grade fatty acids may alternatively be used as a heat generation substance, and content thereof in this case is enough to cause the aerosol-generation substrate 110 to form aerosols through vaporization.

[0038] In some embodiments, the aerosol-generation substrate 110 is a solid substrate. Optionally, the aerosol-generation substrate 110 is in at least one shape of powders, particles, sheets, wires, spaghettis, or strips. It may be understood that, the solid aerosol-generation substrate 110 is not limited to be in the foregoing shape and may also be in other shapes.

[0039] Specifically, the aerosol-generation substrate 110 includes a functional material and a substrate material. The functional material causes the aerosol-generation substrate 110 to generate aerosols; and the substrate material provides support to the functional material to form the aerosol-generation substrate 110. More specifically, the functional material includes a volatile flavor substance and an aerosol-forming agent. The aerosol-forming agent is used for forming aerosols; and the volatile flavor substance is used for adding flavors to aero-

sols. Use amounts and types of the volatile flavor substance and the aerosols may be selected and matched according to a requirement.

[0040] The volatile flavor substance is from a natural raw material or artificially synthesized. Optionally, the volatile flavor substance is at least one selected from the group consisting of alcohols, aldehydes, ketones, lipids, phenols, terpenoids, low-grade fatty acids that include flavors, and any combination thereof. In an embodiment, the volatile flavor substance is an extract of at least one of a leaf, a stem, a root, or a flower of a plant. Certainly, the volatile flavor substance may be selected and matched according to an actual requirement. It may be understood that, in some embodiments, the volatile flavor substance may be omitted.

[0041] Optionally, the aerosol-forming agent includes water and/or other polar molecules. As described above, water is a polar molecule having a good polarity, which can generate heat in an alternating electric field for heating. In an embodiment, the aerosol-generation substrate 110 is a solid substrate, and water content in the aerosol-generation substrate 110 ranges from 6wt% to 18wt%. Further, the water content in the aerosol-generation substrate 110 ranges from 8wt% to 14wt%. Optionally, the other polar molecules are at least one selected from the group consisting of triethylene glycol, butylene glycol, glycerol, propylene glycol, and any combination thereof. It may be understood that, in some other embodiments, the other polar molecules are not limited to the foregoing.

[0042] In some embodiments, the substrate material is made of a natural raw material including a volatile flavor substance; and the aerosol-generation substrate 110 is made by mixing the substrate material and the functional material. In an embodiment, the substrate material is at least one of a leaf, a stem, a root, or a flower of a plant. In an optional specific example, the plant is an herb. Under the action of the alternating electric field, the natural material including a volatile flavor substance can release the flavor substance and form aerosols. It may be understood that, when the substrate material is made of a natural raw material (for example, an herb) including a volatile flavor substance, the volatile flavor substance and the aerosol-forming agent can be both provided by the substrate material, and thus the functional material can be omitted in this case. In this case, the water content of the plant is enough to cause the plant to be heated under the action of the alternating electric field to form aerosols through vaporization. For example, in this case, the water content of the plant ranges from 6wt% to 18wt%.

[0043] In an optional specific example, the substrate material is tobacco. Main components in the tobacco are insoluble polysaccharides, such as starch, cellulose, and pectin. Content of the starch in mature tobacco ranges from 10% to 30%. The cellulose is a basic substance forming cellular tissue and skeleton of the tobacco, and content of the cellulose in the tobacco is generally about 11%, which increases as a grade of the tobacco decreases. Content of the pectin in the tobacco is about 12%,

and the pectin affects physical performance such as the elasticity and toughness of the tobacco. Due to the existence of the pectin, when water content in the tobacco is great, the elasticity and toughness of the tobacco are increased; and when water content is small, the tobacco is friable and fragile. Certainly, when the substrate material is tobacco, the functional material can be omitted. In this case, the water content of the tobacco is enough to cause the tobacco to be heated under the action of the alternating electric field to form aerosols through vaporization. For example, in this case, the water content of the tobacco ranges from 6wt% to 18wt%.

[0044] In some other embodiments, the substrate material is an artificially synthesized material. In an embodiment, the substrate material is a porous material, and the functional material is filled in the substrate material. In another embodiment, the substrate material is in a shape of particles, wires, pieces, or powders; the functional material is distributed in the substrate material; and the aerosol-generation substrate 110 is formed by mixing the functional material and the substrate material. When the substrate material is an artificially synthesized material, the substrate material only serves as a carrier and does not release a flavor substance. Specifically, the substrate material is an artificially synthesized porous material, for example, a porous polymer.

[0045] A frequency of an alternating electric field required by the aerosol-generation substrate 110 for generating aerosols ranges from 10 MHz to 5 GHz. In some embodiments, the frequency of the alternating electric field required by the aerosol-generation substrate for generating aerosols ranges from 10 MHz to 49 MHz. In an optional specific example, the frequency of the alternating electric field required by the aerosol-generation substrate for generating aerosols is 10 MHz, 15 MHz, 20 MHz, 25 MHz, 30 MHz, 35 MHz, 40 MHz, or 49 MHz. In some other embodiments, the frequency of the alternating electric field required by the aerosol-generation substrate for generating aerosols ranges from 981 MHz to 5 GHz. In an optional specific example, the frequency of the alternating electric field required by the aerosol-generation substrate for generating aerosols is 985 MHz, 1000 MHz, 1 GHz, 1.5 GHz, 2 GHz, 2.5 GHz, 3 GHz, 3.5 GHz, 4 GHz, or 4.5 GHz.

[0046] In some embodiments, the aerosol-generation article 100 further includes a heating-assisting material close to the aerosol-generation substrate 110. Specifically, the heating-assisting material is arranged in the aerosol-generation substrate 110. Further, the heating-assisting material is distributed in the aerosol-generation substrate 110. By distributing the heating-assisting material in the aerosol-generation substrate 110, the aerosol-generation substrate 110 can be heated uniformly, and the consistency of aerosols formed by the aerosol-generation substrate 110 is better. It may be understood that, in some embodiments, the heating-assisting material is not limited to being distributed in the aerosol-generation substrate, and may also be in a shape of a sheet,

a rod, a pin or the like, and close to the aerosol-generation substrate 110, to conduct heat to the aerosol-generation substrate 110.

[0047] In some embodiments, the heating-assisting material is a material that can generate heat more easily and/or have a higher heat generation efficiency than the aerosol-generation substrate 110 in the alternating electric field in which the aerosol-generation substrate 110 is located. In this case, one part of a heat source for vaporization of the aerosol-generation substrate 110 is from heat generated by the aerosol-generation substrate 110 under the alternating electric field, and another part of the heat source is from heat generated by the heating-assisting material under the alternating electric field. It may be understood that, in some embodiments, heat generated by the aerosol-generation substrate 110 under the action of the alternating electric field is relatively small. In this case, heat required for vaporization of the aerosol-generation substrate 110 is mainly from heat generated by the heating-assisting material.

[0048] Optionally, under the action of the alternating electric field, a dielectric loss factor of the heating-assisting material is greater than a dielectric loss factor of the aerosol-generation substrate 110. It may be understood that, the heating-assisting material can have a higher heat generation rate than the aerosol-generation substrate 110 under a heating frequency of the alternating electric field, which can achieve a more efficient heating efficiency. For example, a dielectric loss of tobacco with water content of 15wt% is about 0.075, the dielectric loss increases as the water content increases; and the dielectric loss is about 0.487 when the water content is 30wt%. However, the quality of the tobacco may be affected when the water content is excessively great. Therefore, it is relatively appropriate when the water content of the aerosol-generation substrate 110 ranges from 6wt% to 18wt%. Meanwhile, in a case that the water content is relatively low, to improve the heat generation efficiency, the heating-assisting material may be added to the aerosol-generation substrate 110 to improve the heat generation efficiency.

[0049] In some embodiments, the heating-assisting material is an attenuation ceramic. In an optional specific example, the attenuation ceramic is an aluminum nitride-based attenuation ceramic. The aluminum nitride-based attenuation ceramic has good thermal conduction performance, where a theoretical value of thermal conductivity is about 320 W/m·K, and has a moderate thermal expansion coefficient, a reliable electrical insulation, stable chemical and thermal performances, a good mechanical performance, and no toxicity. In addition, during actual production, some substances with a great loss, for example, attenuation agents such as SiC, TiB₂, Mo, W, and C, are generally added to a substrate of the aluminum nitride-based attenuation ceramic, to achieve a specific attenuation effect. In some specific embodiments, a dielectric loss of AlN-TiB₂ attenuation ceramic is about 0.17, and a dielectric loss of tobacco whose water content

is greater than 15% is 0.075.

[0050] The electronic vaporizer 200 can generate an alternating electric field to cause the aerosol-generation substrate 110 of the aerosol-generation article 100 to generate heat to form aerosols through vaporization. Specifically, the electronic vaporizer 200 includes a housing, a power source module, and an alternating electric field generation module. The housing is configured to accommodate other elements of the electronic vaporizer 200. The power source module supplies power to the alternating electric field generation module. The alternating electric field generation module is configured to generate an alternating electric field that can cause the aerosol-generation substrate 110 of the foregoing aerosol-generation article 100 to generate heat to form aerosols through vaporization.

[0051] Specifically, the housing includes an accommodating cavity, and the power source module and the alternating electric field generation module are both arranged in the accommodating cavity. More specifically, the accommodating cavity includes a bottom portion and an opening opposite to the bottom portion. The power source module supplies power to other components (for example, the alternating electric field generation module) in the electronic vaporizer 200. In an embodiment, the power source module is close to the bottom portion of the accommodating cavity. The power source module includes a battery. It may be understood that, in some embodiments, the battery may be omitted. In this case, the electronic vaporizer 200 needs to be connected to an external power source for use.

[0052] The alternating electric field generation module includes an alternating voltage generator, a first electrode 210, and a second electrode 220. The alternating voltage generator is electrically connected to the power source. The alternating voltage generator provides an alternating voltage for the first electrode 210 and the second electrode 220, to form the alternating electric field between the first electrode 210 and the second electrode 220. An accommodating space that can accommodate the aerosol-generation substrate 110 is provided in at least some regions on which the alternating electric field is distributed, so that the aerosol-generation substrate 110 in the alternating electric field can generate heat and form aerosols through vaporization under the action of the alternating electric field. The first electrode 210, the aerosol-generation article 100 arranged between the first electrode 210 and the second electrode 220, and the second electrode 220 form an equivalent capacitor.

[0053] Referring to FIG. 2 to FIG. 5, in some embodiments, the first electrode 210 is in a shape of a plate or a cylinder; and the second electrode 220 is in a shape of a plate or a cylinder. In the embodiment shown in FIG. 2, the first electrode 210 is in a shape of a plate, the second electrode 220 is in a shape of a cylinder, and the first electrode 210 is arranged in the second electrode 220. In the embodiment shown in FIG. 3, the first electrode 210 is in a shape of a column, the second electrode

220 is in a shape of a cylinder, and the first electrode 210 and the second electrode 220 are concentrically arranged. In the embodiments shown in FIG. 4 and FIG. 5, the first electrode 210 and the second electrode 220 are both in a shape of a plate.

[0054] In some embodiments, one first electrode 210 and one second electrode 220 are provided. In some other embodiments, a plurality of first electrodes 210 are arranged at intervals, and a plurality of second electrodes 220 are arranged at intervals; and the alternating voltage generator is configured to provide an alternating voltage for the plurality of first electrodes 210 and the corresponding second electrodes 220 according to a preset mode. Optionally, the preset mode is to perform segmented heating with different powers or perform sequential segmented heating. Specifically, the segmented heating with different powers refers to that heat generation degrees of different parts on the aerosol-generation substrate 110 are different. For example, in an embodiment whose structure arrangement is shown in FIG. 6, the aerosol-generation substrate 110 is divided into an upper segment, a middle segment, and a lower segment from top to bottom according to positions corresponding to the first electrodes 210 and the second electrodes 220. The middle segment of the aerosol-generation substrate 110 has a largest heat generation degree and a highest temperature, and the upper segment and the lower segment have smaller heat generation degrees and lower temperatures than the middle segment. The sequential segmented heating refers to that the heat generation degree of the aerosol-generation substrate is gradually increased or decreased in a specific direction. For example, in another embodiment whose structure arrangement is shown in FIG. 6, the aerosol-generation substrate 110 is divided into an upper segment, a middle segment, and a lower segment from top to bottom according to positions corresponding to the first electrodes 210 and the second electrodes 220. The heat generation degree and the temperature of the aerosol-generation substrate 110 are sequentially increased according to an order of the lower segment, the middle segment, and the upper segment.

[0055] In the embodiment shown in FIG. 6, three first electrodes 210 and three second electrodes 220 are provided. It may be understood that, in some other embodiments, the number of the first electrodes 210 is not limited to three and may also be any other integer greater than one; and the number of the second electrodes 220 is also not limited to three and may also be any other integer greater than one.

[0056] A frequency of the alternating electric field generated by the alternating electric field generation module matches the heated aerosol-generation substrate 110 and/or heating-assisting material. Optionally, the frequency of the alternating electric field generated by the alternating electric field generation module ranges from 10 MHz to 5 GHz. In an embodiment, the frequency of the alternating electric field generated by the alternating

electric field generation module ranges from 10 MHz to 49 MHz. In an optional specific example, the frequency of the alternating electric field required by the aerosol-generation substrate for generating aerosols is 10 MHz, 15 MHz, 20 MHz, 25 MHz, 30 MHz, 35 MHz, 40 MHz, or 49 MHz. In some other embodiments, the frequency of the alternating electric field generated by the alternating electric field generation module ranges from 981 MHz to 5 GHz. In an optional specific example, the frequency of the alternating electric field required by the aerosol-generation substrate for generating aerosols is 985 MHz, 1000 MHz, 1 GHz, 1.5 GHz, 2 GHz, 2.5 GHz, 3 GHz, 3.5 GHz, 4 GHz, or 4.5 GHz. Further, the frequency of the alternating electric field generated by the alternating electric field generation module ranges from 985 MHz to 1000 MHz, from 1 GHz to 1.5 GHz, from 1.6 GHz to 2 GHz, from 2.1 GHz to 2.5 GHz, from 2.6 GHz to 3 GHz, from 3.1 GHz to 3.5 GHz, or from 3.6 GHz to 4 GHz.

[0057] In an embodiment, a waveform of an alternating voltage generated by the alternating voltage generator is a sine wave, a square wave, or a sawtooth wave.

[0058] In some embodiments, the electronic vaporizer 200 further includes an electromagnetic shielding member 230. The electromagnetic shielding member 230 is configured to shield or attenuate an overflowed electromagnetic field excited by the alternating electric field between the first electrode 210 and the second electrode 220. In an embodiment, the electromagnetic shielding member 230 is made of a material selected from a conductive material, a composite material of metals and insulators, or a ferrite material. In an optional specific example, the conductive material is at least one selected from the group consisting of copper, aluminum, iron, nickel, and any combination thereof. The composite material is selected from rubber or plastic filled with metal powder or metal fiber (for example, nickel wire, copper wire, silver wire, or the like). The ferrite material is selected from manganesezinc ferrite or nickel-copper ferrite. It may be understood that, in some other embodiments, the conductive material, the composite material of metals and insulators, and the ferrite material forming the electromagnetic shielding member 230 are not limited to the foregoing.

[0059] In some embodiments, the electromagnetic shielding member 230 is arranged between the first electrode 210 and the second electrode 220, and wraps the aerosol-generation article 100 in the electromagnetic shielding member, for example, referring to the embodiment shown in FIG. 4. In some other embodiments, the electromagnetic shielding member 230 is arranged outside the equivalent capacitor formed by the first electrode 210, the aerosol-generation substrate 110, and the second electrode 220, and wraps the equivalent capacitor in the electromagnetic shielding member, for example, referring to the embodiment shown in FIG. 5.

[0060] In some embodiments, the aerosol-generation article 100 further includes a first temperature sensor 120. Specifically, the first temperature sensor 120 is con-

figured to sense a temperature of the aerosol-generation substrate 110, which facilitates the electronic vaporizer 200 to control a heat generation temperature of the aerosol-generation substrate 110. In some embodiments, the first temperature sensor 120 is a thermocouple temperature sensor, a negative temperature coefficient (NTC) temperature sensor, a positive temperature coefficient (PTC) temperature sensor, or a temperature coefficient of resistance (TCR) temperature sensor. Certainly, in some other embodiments, the first temperature sensor 120 is not limited to the foregoing, and other types of temperature sensors may also be used.

[0061] Referring to FIG. 7, in some embodiments, the first temperature sensor 120 includes a dielectric material whose dielectric constant changes with a temperature. A Curie temperature of the dielectric material falls within a temperature range required by the aerosol-generation article 100 for forming aerosols. Because the dielectric constant of the dielectric material may change as the temperature changes, temperature measurement can be implemented by detecting changes of the dielectric constant of the dielectric material. The Curie temperature (T_c) is also referred to as a Curie point, which refers to a temperature at which the spontaneous magnetization intensity in a magnetic material is reduced to zero, and refers to a critical point that a ferromagnetic or ferrimagnetic substance is transformed into a paramagnetic substance. When the temperature is the Curie temperature, the dielectric constant of the dielectric material is maximized. By designing the Curie temperature of the dielectric material to be within the temperature range required by the aerosol-generation article 100 for forming aerosols, the sensitivity of the first temperature sensor 120 can be improved.

[0062] Optionally, the dielectric material is a solid dielectric material. In some embodiments, the dielectric material is a ferroelectric material. In an embodiment, the dielectric material is at least one selected from the group consisting of niobate, zirconate, titanate, bismuthate, and any combination thereof. In an optional specific example, the dielectric material is at least one selected from the group consisting of NaNbO_3 , $\text{K}_{0.5}\text{Na}_{0.5}\text{NbO}_3$, $0.96\text{K}_{0.5}\text{Na}_{0.5}\text{NbO}_3$ - $0.04\text{Bi}_{0.5}\text{Na}_{0.5}\text{ZrO}_3$, and any combination thereof. It may be understood that, the dielectric material is not limited to the foregoing, and other dielectric materials may also be selected according to a specific situation. It may be understood that, in some other embodiments, the first temperature sensor 120 may further include other components in addition to the solid dielectric material. Certainly, the dielectric material is not limited to the solid dielectric material and may also be a liquid dielectric material.

[0063] In some embodiments, the temperature required by the aerosol-generation substrate 110 for forming aerosols ranges from 250°C to 450°C ; and the Curie temperature of the dielectric material ranges from 250°C to 450°C . Further, the temperature required by the aerosol-generation substrate 110 for forming aerosols ranges

from 250°C to 400°C ; and the Curie temperature of the dielectric material ranges from 250°C to 400°C . Further, the temperature required by the aerosol-generation article 100 for forming aerosols ranges from 200°C to 350°C ; and the Curie temperature of the dielectric material ranges from 200°C to 350°C . In an embodiment, the temperature required by the aerosol-generation substrate 110 for forming aerosols ranges from 250°C to 400°C , and the Curie temperature of the dielectric material is 400°C .

[0064] In some embodiments, the first temperature sensor 120 is arranged in the aerosol-generation substrate 110. In this case, the first temperature sensor 120 characterizes a temperature inside the aerosol-generation substrate 110. In an embodiment, the first temperature sensor 120 is in a shape of a rod or a sheet. In this case, the first temperature sensor 120 is inserted in the aerosol-generation substrate 110. Further, an acute angle is formed between a length direction of the first temperature sensor 120 and a length direction of the aerosol-generation article 100. In the embodiment shown in FIG. 7, the length direction of the first temperature sensor 120 is parallel to the length direction of the aerosol-generation article 100. In another embodiment, the first temperature sensor 120 is in a shape of particles, powders, or pieces. In this case, the first temperature sensor 120 is distributed in the aerosol-generation substrate 110.

[0065] In some other embodiments, the first temperature sensor 120 is arranged on a surface of the aerosol-generation substrate 110. Specifically, the aerosol-generation substrate 110 is a substrate with a shape (for example, a sheet shape or a column shape), which is formed by powder-shaped, particle-shaped, and/or wire-shaped, etc., fine materials through a forming process; and the first temperature sensor 120 is arranged on an outer surface of the aerosol-generation substrate 110. In this case, the first temperature sensor 120 characterizes a temperature outside the aerosol-generation substrate 110.

[0066] In some other embodiments, the first temperature sensor 120 is arranged on a surface of the packaging layer and close to the aerosol-generation substrate 110. In this case, the first temperature sensor 120 characterizes a temperature outside the aerosol-generation substrate 110. In an embodiment, the first temperature sensor 120 is arranged on an outer surface of the packaging layer. In another embodiment, the first temperature sensor 120 is arranged on an inner surface of the packaging layer.

[0067] Specifically, to implement temperature control, in addition to that the aerosol-generation article 100 includes the first temperature sensor 120, the electronic vaporizer 200 further includes a detection module and a controller. The detection module is configured to detect the changes of the dielectric constant of the aerosol-generation article 100 arranged in the alternating electric field and feed back a detection result to the controller. The controller is configured to control the output of the alter-

nating voltage generator according to the detection result, to control the temperature of the aerosol-generation substrate 110, thereby preventing the aerosol-generation article 100 from generating a burnt flavor due to an excessively high temperature of the aerosol-generation substrate 110. It may be understood that, the detection module may directly detect the dielectric constant of the aerosol-generation article 100 arranged in the alternating electric field, or may indirectly obtain the dielectric constant of the aerosol-generation article 100 arranged in the alternating electric field by detecting a parameter related to the dielectric constant. For example, the changes of the dielectric constant of the aerosol-generation article 100 is detected by detecting capacitance changes of the equivalent capacitor formed by the first electrode 210, the second electrode 220, and the aerosol-generation article 100 arranged between the first electrode 210 and the second electrode 220 or a resonance frequency of a resonance circuit in which the equivalent capacitor is located.

[0068] In some embodiments, the detection module is configured to detect the capacitance changes of the equivalent capacitor formed by the first electrode 210, the second electrode 220, and the aerosol-generation article 100 arranged between the first electrode 210 and the second electrode 220. The changes of the dielectric constant of the aerosol-generation article 100 are detected by detecting the capacitance changes of the equivalent capacitor. Specifically, the detection module is configured to detect a capacitance of the equivalent capacitor and feed back a detection result to the controller; and the controller matches the detection result fed back by the detection module with a preset heating program to implement heating control. In this case, the controller is electrically connected to the alternating voltage generator, and the controller is configured to control the output of the alternating voltage generator according to the capacitance changes of the equivalent capacitor, to implement temperature control during heating. In this case, the principle that the controller obtains the temperature of the aerosol-generation substrate 110 lies in that: there is a correspondence between the dielectric constant of the dielectric material of the first temperature sensor 120 and the temperature, and there is a correspondence between the capacitance of the equivalent capacitor and the dielectric constant of the dielectric material of the first temperature sensor 120 in the equivalent capacitor. Therefore, the temperature of the aerosol-generation substrate 110 that is sensed by the first temperature sensor 120 can be obtained by detecting the capacitance of the equivalent capacitor. Specifically, the controller stores a dielectric constant-temperature characteristic curve of the dielectric material of the first temperature sensor 120. It may be understood that, when the dielectric constant-temperature characteristic curve of the dielectric material of the first temperature sensor 120 is stored in the controller, changes of dielectric constants of other components of the aerosol-generation article 100 with

the temperature in the alternating electric field can be negligible. It may be understood that, in some other embodiments, the controller is not limited to storing only the dielectric constant-temperature characteristic curve of the dielectric material of the first temperature sensor 120, and may also store a dielectric constant-temperature characteristic curve of a composite material formed by the dielectric material and other related materials, provided that the temperature of the aerosol-generation substrate 110 can be reflected. Certainly, in this case, the changes of the dielectric constants of other components other than the dielectric material of the first temperature sensor 120 of the aerosol-generation article 100 with the temperature are not specifically limited herein.

[0069] In the embodiment shown in FIG. 7, one first electrodes 210 and one second electrodes 220 are provided. In some other embodiments, a plurality of first electrodes 210 are arranged at intervals, and a plurality of second electrodes 220 are arranged at intervals. The plurality of first electrodes 210 and the corresponding second electrodes 220 are configured to cooperatively form equivalent capacitors at different positions on the aerosol-generation article 100. The detection module detects dielectric constants at different positions on the aerosol-generation article 100 by detecting capacitances of the equivalent capacitors at different positions, and thus the controller can comprehensively adjust the temperature of the aerosol-generation substrate 110. It may be understood that, the detection module may detect the capacitances of the equivalent capacitors at different positions at the same time, or may detect the capacitances of the equivalent capacitors at different positions sequentially within a specific time range. In the embodiment shown in FIG. 8, three first electrodes 210 and three second electrodes 220 are provided. It may be understood that, in some other embodiments, the number of the first electrodes 210 is not limited to three and may also be any other integer greater than one; and the number of the second electrodes 220 is also not limited to three and may also be any other integer greater than one.

[0070] In some embodiments, the detection module is configured to detect changes of a resonance frequency of a resonance circuit in which the equivalent capacitor is located. The changes of the dielectric constant of the aerosol-generation article 100 is obtained by detecting the changes of the resonance frequency of the resonance circuit in which the equivalent capacitor is located. Specifically, the electronic vaporizer 200 further includes an inductance coil. The power source, the inductance coil, and the equivalent capacitor form the resonance circuit; the detection module is configured to detect the resonance frequency of the resonance circuit and feed back a detection result to the controller; and the controller matches the detection result fed back by the detection module with a preset heating program, to implement heating control. In this case, the principle that the controller obtains the temperature of the aerosol-generation substrate 110 lies in that: there is a correspondence be-

tween the dielectric constant of the dielectric material of the first temperature sensor 120 and the temperature, there is a correspondence between the capacitance of the equivalent capacitor and the dielectric constant of the dielectric material of the first temperature sensor 120 in the equivalent capacitor, and there is a correspondence between the resonance frequency of the resonance circuit and the capacitance of the equivalent capacitor. Therefore, the temperature of the aerosol-generation substrate 110 that is sensed by the first temperature sensor 120 can be obtained by detecting the resonance frequency of the resonance circuit.

[0071] Further, because the temperature change in the aerosol-generation substrate is apparent when aerosols formed by the aerosol-generation article 100 are inhaled, and the change can be sensed by the first temperature sensor 120, and can be reflected by the resonance frequency (the resonance frequency may jump apparently), the number of times of inhalation can be counted according to peaks and troughs of the characteristic change of the resonance frequency, and an output of an alternating voltage generator is adjusted according to the counted number of times of inhalation to improve the taste of the aerosols. Therefore, in some embodiments, the electronic vaporizer 200 further includes an inhalation counting module. The inhalation counting module is configured to collect the number of peaks and/or troughs of the resonance frequency, calculate the number of times of inhalation, and feed back the number of times of inhalation to the controller. In this case, the controller is further configured to control the output of the alternating voltage generator according to a counting result fed back by the inhalation counting module.

[0072] Specifically, the heating program includes a warming program and a cooling program. When a temperature corresponding to the detection result (the capacitance of the equivalent capacitor, the dielectric constant, or the resonance frequency) fed back by the detection module and received by the controller is lower than a preset cooling temperature, the controller controls the alternating voltage generator to output normally, that is, the warming program is run; and when the temperature corresponding to the detection result fed back by the detection module and received by the controller is higher than or equal to the preset cooling temperature, the controller controls the alternating voltage generator to reduce the output, that is, the cooling program is run.

[0073] In some embodiments, the controller is further configured to control a heating start program. Specifically, when the aerosol-generation article 100 is arranged between the first electrode 210 and the second electrode 220 to form an equivalent capacitor, the detection module detects the dielectric constant of the aerosol-generation article 100 arranged between the first electrode 210 and the second electrode 220 and feeds back a detection result to the controller, and the controller matches the detection result fed back by the detection module with a preset startup parameter. In response to that the detec-

tion result matches the preset startup parameter, the heating program is started; and in response to that the detection result does not match the preset startup parameter, the heating program is not started. The heating start program is controlled by the controller, so that the heating program is started only after the aerosol-generation article 100 is identified by the electronic vaporizer 200 as a heatable aerosol-generation article, thereby preventing improper heating and improving the user experience. Meanwhile, the electronic vaporizer 200 includes the corresponding heatable aerosol-generation article 100, which also achieves an anti-counterfeiting effect. It may be understood that, the preset startup parameter refers to a range in consideration of application scenarios of the aerosol-generation article 100. It may be understood that, similarly, when the controller is further configured to control the heating start program, the parameter detected by the detection module is also not limited to the dielectric constant of the aerosol-generation article 100 arranged between the first electrode 210 and the second electrode 220, and may also be other parameters related to the dielectric constant, such as the capacitance of the equivalent capacitor or the resonance frequency of the resonance circuit in which the equivalent capacitor is located that can indirectly reflect the dielectric constant.

[0074] In the foregoing embodiments, the identification is implemented by using the detection module of the electronic vaporizer 200 to detect the capacitance or the resonance frequency corresponding to the dielectric constant of the aerosol-generation article arranged between the first electrode 210 and the second electrode 220. It may be understood that, in some other embodiments, the electronic vaporizer 200 identifies the aerosol-generation article 100 may alternatively be implemented through additionally arranging an identifying material (for example, an identifying label) on the aerosol-generation article 100 and arranging a corresponding identifying module on the electronic vaporizer 200. For example, the aerosol-generation article 100 further includes an identifying material adapted to the electronic vaporizer 200. In some embodiments, the identifying material is arranged in the aerosol-generation substrate 110 or arranged on a surface of the aerosol-generation substrate 110. In some other embodiments, the identifying material is arranged on the packaging layer. For example, the identifying material is arranged on an outer surface or an inner surface of the packaging layer. It may be understood that, specific components of the identifying material are not specifically limited, provided that the identifying material can be adapted to the identifying module of the electronic vaporizer 200. Certainly, in some embodiments, if the electronic vaporizer 200 is not required to have an identifying function, the electronic vaporizer 200 also does not need to include the corresponding identifying module, and the aerosol-generation article 100 also does not need to be provided with the identifying material.

[0075] In some embodiments, the electronic vaporizer

200 further includes a second temperature sensor configured to sense a temperature of the aerosol-generation article. In an embodiment, the principle that the second temperature sensor senses the temperature of the aerosol-generation substrate 110 is the same as the principle of the first temperature sensor 120 in the aerosol-generation article 100. In this case, the second temperature sensor is made of a material same as the first temperature sensor 120 described above. Specifically, the second temperature sensor is arranged on the first electrode 210 and/or the second electrode 220 and arranged in a cavity. If a position relationship between the first electrode 210 and the second electrode 220 is that the first electrode 210 is arranged in the second electrode 220, for example, as shown in FIG. 1, FIG. 2, or FIG. 3, when the second temperature sensor is arranged on the first electrode 210, the second temperature sensor is configured to characterize a temperature inside the aerosol-generation substrate; and when the second temperature sensor is arranged on the second electrode 220, the second temperature sensor is configured to characterize a temperature outside the aerosol-generation substrate. If the first electrode 210 and the second electrode 220 are arranged opposite to each other, the second temperature sensor characterizes a temperature outside the aerosol-generation substrate 110. It may be understood that, in some other embodiments, the second temperature sensor may sense the temperature through other principles, provided that there is a corresponding configuration in this case. Certainly, the second temperature sensor may be arranged on both the first electrode 210 and the second electrode 220.

[0076] In addition, it may be understood that, when the aerosol-generation article 100 includes the first temperature sensor 120, and the electronic vaporizer 200 includes the second temperature sensor, positions of the first temperature sensor 120 and the second temperature sensor do not conflict with each other. For example, when the position relationship between the first electrode 210 and the second electrode 220 is shown in FIG. 3 or FIG. 4 and the second temperature sensor is arranged on the first electrode 210, the first temperature sensor 120 of the aerosol-generation article 100 is away from a region close to the first electrode 210, where the second temperature sensor is accommodated in the cavity. Certainly, when the aerosol-generation article 100 includes the first temperature sensor 120, the second temperature sensor of the electronic vaporizer 200 can be omitted.

[0077] The above vaporization system 10 includes the aerosol-generation article 100 and the electronic vaporizer 200 adapted to the aerosol-generation article 100. The electronic vaporizer 200 matches the aerosol-generation article 100, and the electronic vaporizer 200 generates the alternating electric field to cause the aerosol-generation substrate 110 to form aerosols through vaporization. The above vaporization system 10 at least includes the following advantages:

(1) High heat generation efficiency. Because the aerosol-generation article 100 generates heat by itself (the aerosol-generation substrate 110 and/or the heating-assisting material generates heat) under the action of the alternating electric field, when compared with a vaporization system in which the aerosol-generation substrate is heated by a component other than the aerosol-generation article through heat conduction, the heat generation efficiency of the present invention is high.

(2) Uniform heat generation and high heat generation speed. Because the heat is generated from the inside of a substance, an object in an electric field can be heated uniformly, and the object can have the same temperature from inside to outside, thereby improving the taste of the aerosol-generation article 100 and also improving the utilization of the aerosol-generation article 100.

(3) Immediate heating when powered on and immediate stop when powered off. Because at a specific frequency, loss factors of various substances are different, and electric field energy absorbed by the substances is also different, so that the aerosol-generation article 100 can be heated in a targeted manner, thereby greatly improving the heating efficiency and reducing power consumption.

(4) Easy cleaning of the electronic vaporizer 200. When compared with arranging a heat generation body in a conventional electronic vaporizer, the vaporization system 10 implements vaporization through the heat generated by the aerosol-generation article 100. Therefore, the heat generation body does not need to be arranged in the electronic vaporizer 200, and the inhalation taste is prevented from being affected by residues deposited on the heat generation body. In addition, because the electronic vaporizer 200 may not be provided with the heat generation body, the electronic vaporizer is easier to clean.

[0078] The technical features in the foregoing embodiments may be randomly combined. For concise description, not all possible combinations of the technical features in the embodiments are described. However, provided that combinations of the technical features do not conflict with each other, the combinations of the technical features are considered as falling within the scope described in this specification.

[0079] The foregoing embodiments only describe several implementations of the present invention, which is for specific and detailed understanding of the technical solutions of the present invention, but cannot therefore be understood as a limitation to the patent scope of the present invention. It should be understood that, technical solutions obtained by a person skilled in the art through logical analyses or inferences or limited experiments based on the technical solutions provided in the present invention all fall within the protection scope of the ap-

pendent claims of the present invention. Therefore, the protection scope of the patent of the present invention shall be subject to the content of the appended claims, and this description and the accompanying drawings can be used for explaining the content of the claims.

Claims

1. An aerosol-generation article, **characterized by**, comprising an aerosol-generation substrate, wherein the aerosol-generation substrate is a solid substrate; and the aerosol-generation article generates heat under the action of an alternating electric field to form aerosols through vaporization.

2. The aerosol-generation article according to claim 1, wherein the aerosol-generation substrate comprises polar molecules; and preferably, the polar molecules are at least one selected from the group consisting of water, alcohols, aldehydes, ketones, lipids, phenols, terpenoids, low-grade fatty acids, and any combination thereof.

3. The aerosol-generation article according to claim 1, wherein a frequency of the alternating electric field ranges from 10 MHz to 5 GHz.

4. The aerosol-generation article according to claim 1, further comprising a heating-assisting material close to the aerosol-generation substrate;

wherein preferably, under the action of the alternating electric field, a dielectric loss factor of the heating-assisting material is greater than a dielectric loss factor of the aerosol-generation substrate; and preferably, the heating-assisting material is an attenuation ceramic.

5. The aerosol-generation article according to any one of claims 2 to 4, wherein water content in the aerosol-generation substrate ranges from 6wt% to 18wt%; and preferably, the water content in the aerosol-generation substrate ranges from 8wt% to 14wt%.

6. An electronic vaporizer, **characterized by**, comprising:

a power source module; and an alternating electric field generation module, wherein the power source module supplies power to the alternating electric field generation module; and the alternating electric field generation module is configured to generate an alternating electric field causing the aerosol-generation substrate of the aerosol-generation article

according to any one of claims 1 to 5 to generate heat to form aerosols.

7. The electronic vaporizer according to claim 6, wherein a frequency of the alternating electric field ranges from 10 MHz to 5 GHz; and/or a waveform of an alternating voltage generating the alternating electric field is a sine wave, a square wave, or a sawtooth wave.

8. The electronic vaporizer according to claim 6, wherein the alternating electric field generation module comprises an alternating voltage generator, a first electrode, and a second electrode; the alternating voltage generator provides an alternating voltage for the first electrode and the second electrode, to form the alternating electric field between the first electrode and the second electrode; and an accommodating space for accommodating the aerosol-generation substrate is provided in at least some regions on which the alternating electric field is distributed.

9. The electronic vaporizer according to claim 8, wherein the first electrode is in a shape of a plate or a cylinder; and the second electrode is in a shape of a plate or a cylinder.

10. The electronic vaporizer according to claim 8, wherein a plurality of first electrodes are arranged at intervals; and a plurality of second electrodes are arranged at intervals; and the alternating voltage generator is configured to provide an alternating voltage for the plurality of first electrodes and the corresponding second electrodes according to a preset mode.

11. The electronic vaporizer according to claim 10, wherein the preset mode is to perform segmented heating with different powers or perform sequential segmented heating.

12. The electronic vaporizer according to any one of claims 6 to 11, further comprising an electromagnetic shielding member, wherein the electromagnetic shielding member is configured to shield or attenuate an overflowed electromagnetic field excited by the alternating electric field.

13. The electronic vaporizer according to any one of claims 8 to 11, further comprising a temperature sensor and a controller, wherein the temperature sensor is configured to feed back a temperature of the aerosol-generation substrate to the controller, and the controller is configured to control an output of the alternating voltage generator according to the temperature fed back by

the temperature sensor, to control a heat generation temperature of the aerosol-generation substrate.

14. A vaporization system, **characterized by**, comprising:

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the aerosol-generation article according to any one of claims 1 to 5; and

the electronic vaporizer according to any one of claims 6 to 13 adapted to the aerosol-generation article.

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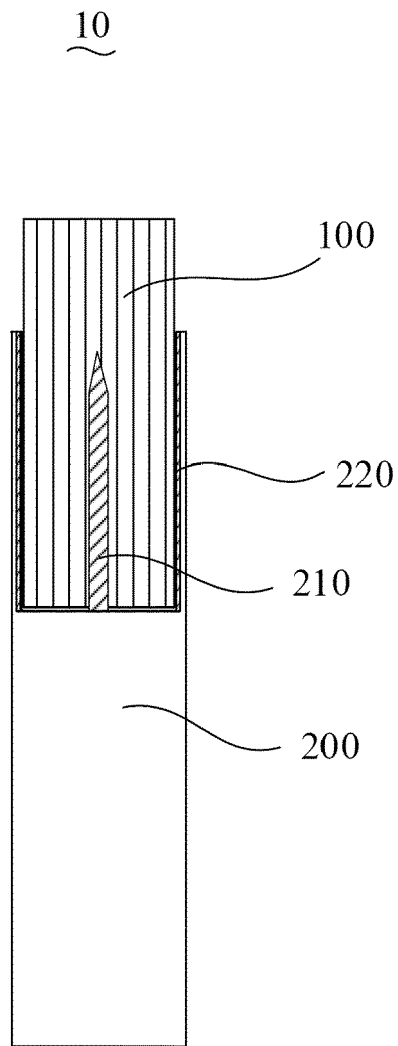


FIG. 1

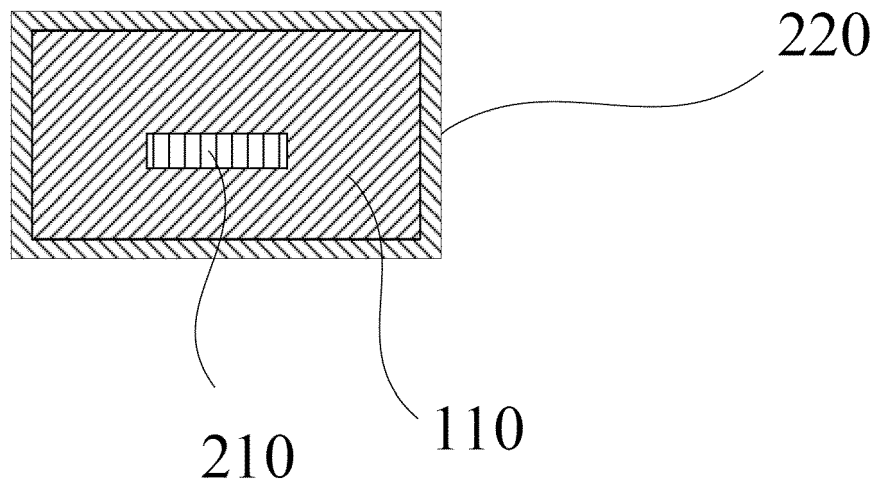


FIG. 2

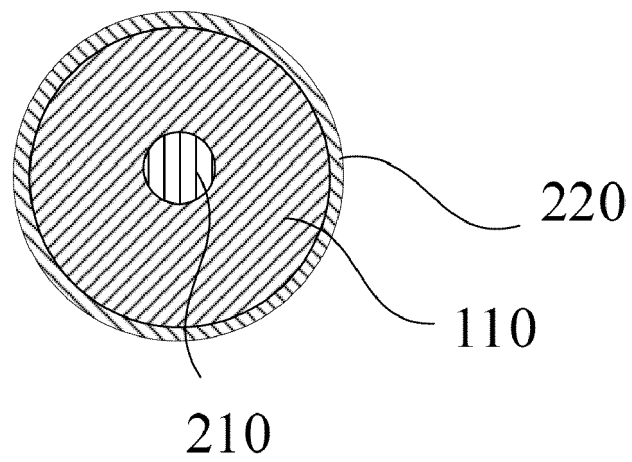


FIG. 3

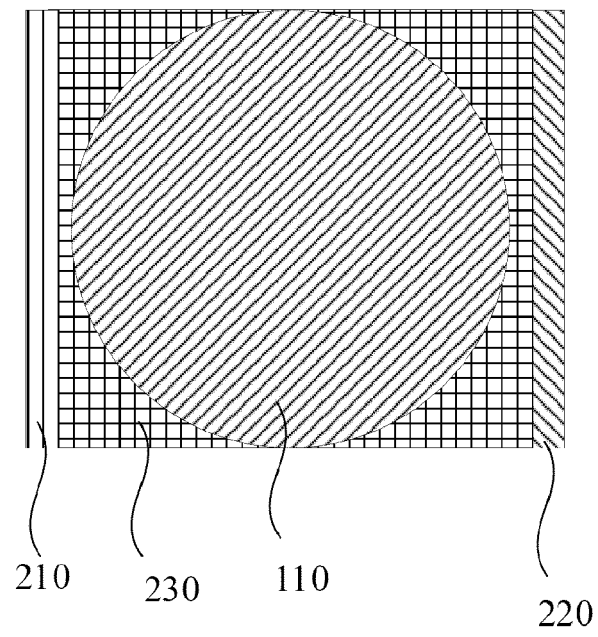


FIG. 4

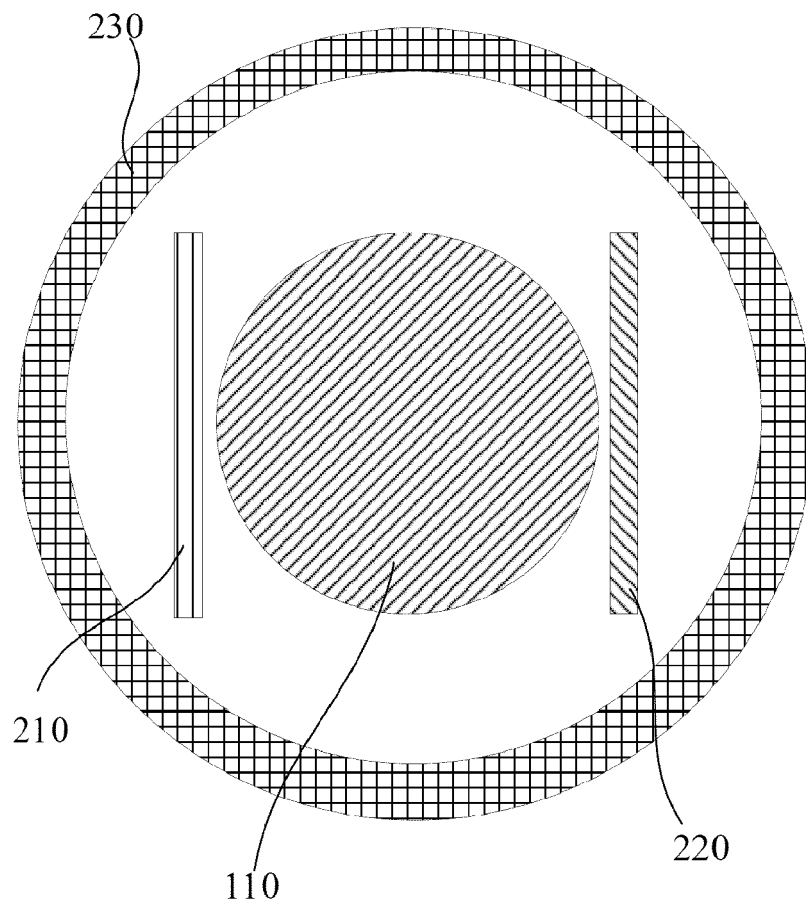


FIG. 5

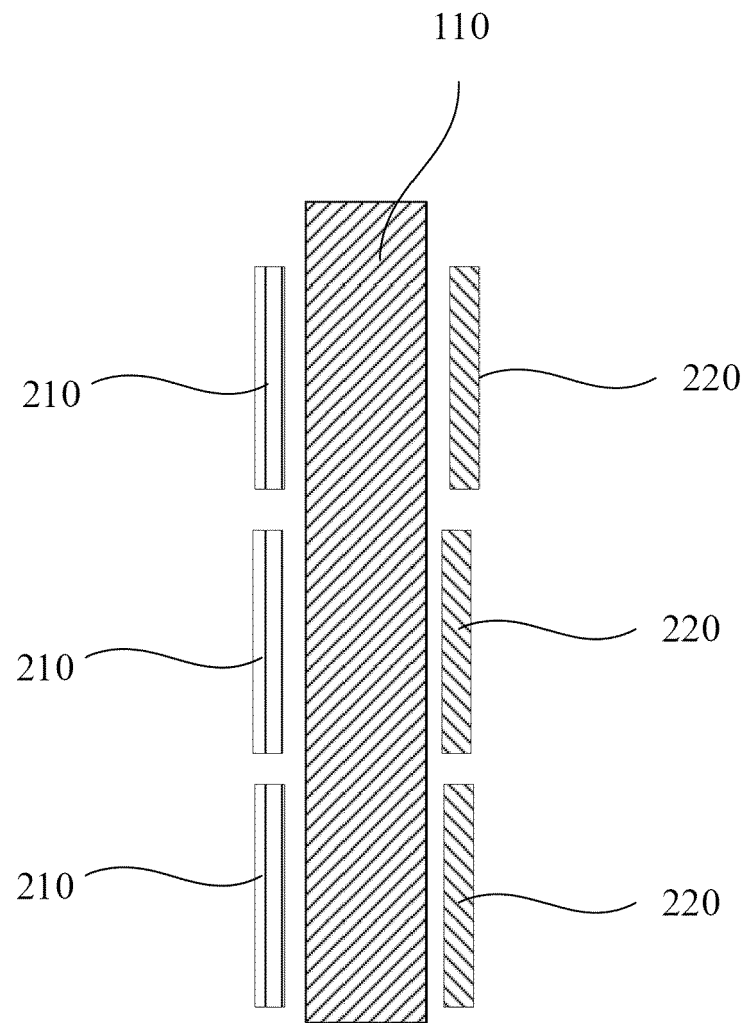


FIG. 6

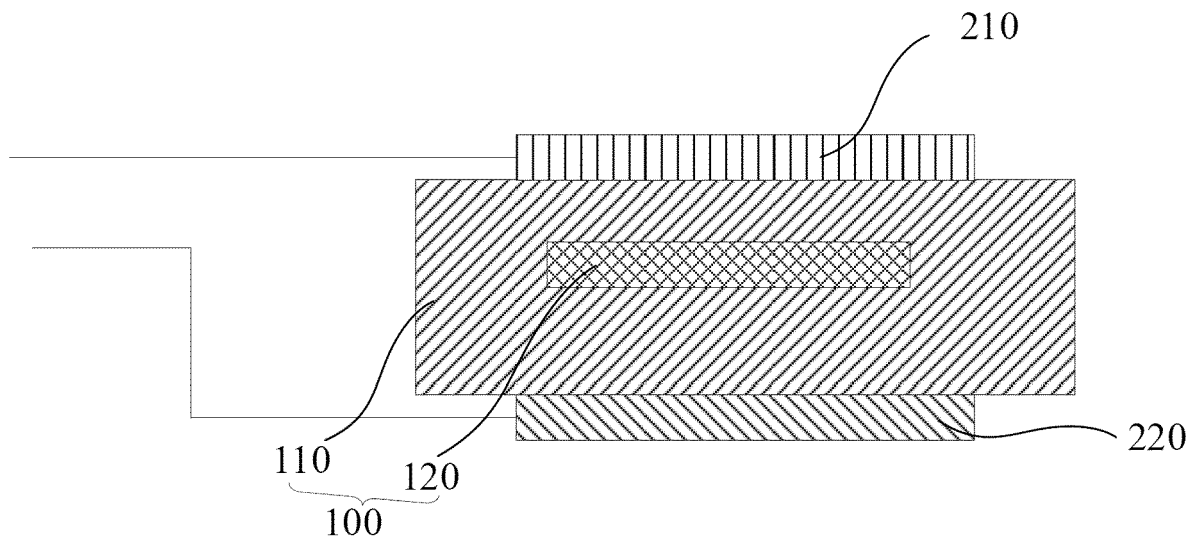


FIG. 7

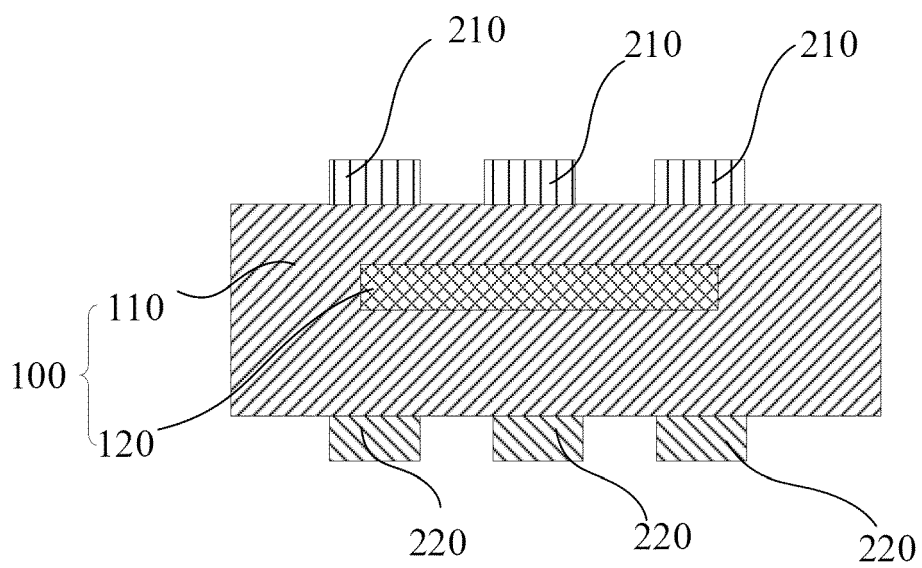


FIG. 8



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Application Number

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Place of search	Date of completion of the search	Examiner
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CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document		

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