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(54) AEROSOL GENERATING PRODUCT, PREPARATION METHOD THEREFOR, AND ELECTRONIC ATOMIZATION APPARATUS

(57) An aerosol generating product, a preparation method therefor, and an electronic atomization apparatus. The aerosol generating product includes a dielectric material and an atomization matrix. The dielectric material includes at least one of modified or unmodified barium titanate, calcium carbonate, diatomite, and titanium dioxide.

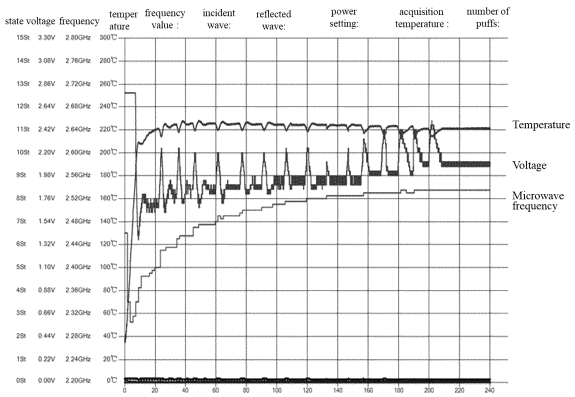


FIG. 1

Processed by Luminess, 75001 PARIS (FR)

Description

RELATED APPLICATIONS

[0001] This application claims priority to Chinese patent application No. 202210962760.5, filed on August 11, 2022, entitled "AEROSOL GENERATING PRODUCT, PREPARATION METHOD THEREFOR, AND ELECTRONIC ATOMIZATION APPARATUS", the entire content of which is incorporated herein by reference.

TECHNICAL FIELD

[0002] The present application relates to the field of electronic atomization technologies, and in particular, to an aerosol generating product, a preparation method therefor, and an electronic atomization apparatus.

BACKGROUND

[0003] Currently, in the market of heat-not-burning products, the mainstream heating technologies are resistive heating and electromagnetic heating. These heating methods primarily rely on heat conduction, convection, and radiation to transfer heat from the outside to the inside. There is inevitably a temperature gradient within the matrix of aerosol-generating products, leading to uneven heating of the matrix and thus localized overheating of the matrix. Therefore, conventional heating methods face issues such as low heating efficiency, high energy consumption, and poor heating uniformity, which results in insufficient aerosol release and inconsistent performance of aerosol generating products, affecting the consumer's puffing experience.

[0004] Microwaves, as a form of electromagnetic wave, can be used for both information transmission and heating. Microwaves also have significant applications in drying, extraction, and sterilization. For instance, industrial products like microwave ovens show superior heating efficiency, energy consumption, and safety over other conventional heating methods. Utilizing microwaves for heating the aerosol-generating products offers advantages such as high heating efficiency, low energy consumption, and uniform heating. However, when microwaves are used for heating the aerosol-generating products, challenges remain, including poor stability of microwave heating and unsatisfactory flavor during puffing the aerosol-generating products.

SUMMARY

[0005] According to embodiments of the present application, an aerosol generating product and a preparation method therefor are provided.

[0006] Additionally, an electronic atomization apparatus including the aerosol generating product is provided.

[0007] An aerosol generating product includes a dielectric material and an atomization matrix.

[0008] The dielectric material includes at least one of modified or unmodified barium titanate, calcium carbonate, diatomite, and titanium dioxide.

[0009] In one of the embodiments, the dielectric material includes modified or unmodified barium titanate.

[0010] In one of the embodiments, the dielectric material includes modified or unmodified barium titanate, titanium dioxide, diatomite, and calcium carbonate in a mass ratio of (10 to 25):(0 to 10):(1 to 25):(5 to 30).

[0011] In one of the embodiments, the dielectric material includes modified or unmodified barium titanate, titanium dioxide, diatomite, and calcium carbonate in a mass ratio of (12 to 20):(1 to 8):(3 to 15):(6 to 20).

[0012] In one of the embodiments, a dielectric constant of the dielectric material is greater than or equal to 2.

[0013] In one of the embodiments, the atomization matrix includes a plant material and an auxiliary material.

[0014] The plant material includes a dried material from at least one of roots, stems, leaves, flowers, or fruits of a plant.

[0015] The auxiliary material includes an atomizing agent, a characteristic providing material, and a binder.

[0016] In one of the embodiments, a mass ratio of the plant material, the dielectric material, and the auxiliary material is 100:(3 to 25):(10 to 60).

[0017] In one of the embodiments, a mass ratio of the plant material to the dielectric material is 100:(7 to 20), and a mass ratio of the plant material to the auxiliary material is 100:(20 to 50).

[0018] In one of the embodiments, a raw material of the plant material has been processed by at least one of a flue-curing process, a sun-curing process, an air-curing process, and a fire-curing process.

[0019] In one of the embodiments, the characteristic providing material includes at least one of a plant extract and a scent regulator.

[0020] In one of the embodiments, the plant extract is an extract from at least one of roots, stems, leaves, flowers, or fruits of a plant. A mass of the plant extract is 8% to 15% of a mass of the plant material.

[0021] In one of the embodiments, a solid content of the plant extract is 60% to 75%.

[0022] In one of the embodiments, the scent regulator includes at least one of β-damascone, dihydrocoumarin, raspberry ketone, 2,3-dimethylpyrazine, α-ionone, p-anisaldehyde, megastigmatrienone, and acetylpyrazine.

[0023] In one of the embodiments, a mass of the scent regulator is 0.1% to 0.5% of the mass of the plant material.

[0024] In one of the embodiments, the binder includes at least one of sodium carboxymethylcellulose, carrageenan, xanthan gum, guar gum, agar, gelatin, sodium alginate, locust bean gum, and konjac glucomannan.

[0025] In one of the embodiments, the binder includes sodium carboxymethylcellulose and guar gum in a mass ratio of (1 to 2): 1.

[0026] In one of the embodiments, a mass of the binder is 8% to 15% of the mass of the plant material.

[0027] In one of the embodiments, the atomizing agent includes propylene glycol and glycerol in a mass ratio of 1:(4 to 5).

[0028] In one of the embodiments, a shape of the aerosol generating product includes a strip shape, a granular shape, a blocky shape, or a filamentous shape.

[0029] A method for preparing an aerosol generating product includes the following step:

mixing and shaping the dielectric material and the atomization matrix to obtain the aerosol generating product;

wherein the dielectric material includes at least one of modified or unmodified barium titanate, diatomite, calcium carbonate, and titanium dioxide.

[0030] An electronic atomization apparatus includes a microwave generator and the aforementioned aerosol generating product. The microwave generator is configured to heat the aerosol generating product.

[0031] Details of one or more embodiments of the present application are presented in the drawings and description below. Further features, objectives, and advantages of the present application will become apparent from the description, drawings and claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0032] In order to more clearly illustrate technical solutions in the embodiments of the present application or conventional technologies, the accompanying drawings required for use in the description of the embodiments or the conventional technologies are briefly introduced below. Obviously, the accompanying drawings described below are only some embodiments of the present application, and for those of ordinary skill in the art, other drawings can be derived from these drawings without creative efforts.

FIG. 1 is a graph showing the microwave heating effect on an aerosol generating product of Example 1.

FIG. 2 is a graph showing the microwave heating effect on an aerosol generating product of Example 2.

FIG. 3 is a graph showing the microwave heating effect on an aerosol generating product of Example 3.

FIG. 4 is a graph showing the microwave heating effect on an aerosol generating product of Comparative Example 1.

DETAILED DESCRIPTION

[0033] The technical solutions in embodiments of the present application are clearly and completely described in the following with reference to the accompanying drawings in the embodiments of the present application. Apparently, the described embodiments are merely some rather than all of the embodiments of the present application. All other embodiments obtained by a person of ordinary skill in the art based on the embodiments of the present application without creative efforts shall fall within the protection scope of the present application.

[0034] Unless otherwise defined, all technical and scientific terms used herein have the same meaning as those commonly understood by those skilled in the art to which the present application belongs. The terms used herein in the specification of the present application are only for the purpose of describing specific embodiments and are not intended to limit the present application.

[0035] To address the problems existing in the conventional aerosol generating products to be microwave-heated, the present application provides an aerosol generating product that can improve the stability of microwave heating and has a good puffing flavor.

[0036] An embodiment of an aerosol generating product includes a dielectric material and an atomization matrix.

[0037] The dielectric material includes at least one of modified or unmodified barium titanate, calcium carbonate, diatomite, and titanium dioxide.

[0038] The incorporation of the dielectric material, which includes at least one of modified or unmodified barium titanate, calcium carbonate, diatomite, and titanium dioxide, not only can improve the microwave heating effect, but also can slow down the rate of change of the dielectric constant of the aerosol generating product during the microwave heating, thereby promoting the stability of microwave heating and improving the consistency of sensory quality before and after puffing. Furthermore, compared to other materials, the incorporation of the aforementioned dielectric material does not affect the flavor of the aerosol generating product during the puffing process, resulting in a better puffing effect.

[0039] In some embodiments, the dielectric material includes modified or unmodified barium titanate. The incorporation of the modified or unmodified barium titanate can further improve the stability of microwave heating.

[0040] In some embodiments, the dielectric material includes modified or unmodified barium titanate, titanium dioxide, diatomite, and calcium carbonate in a mass ratio of (10 to 25):(0 to 10):(1 to 25):(5 to 30).

[0041] The dielectric constant of the aerosol generating product can be regulated by adjusting the ratio of the components of the dielectric material, thereby exhibiting a more beneficial coupling performance with microwave heating. Further, the dielectric material includes modified or unmodified barium titanate, titanium dioxide, diatomite, and calcium carbonate in a mass ratio of (12 to 20):(1 to 8):(3 to 15):(6 to 20). The dielectric constant of the dielectric material is greater than or equal to 2.

[0042] In an example, the dielectric material includes barium titanate, diatomite, and calcium carbonate in a

mass ratio of 1:1:1. In another example, the dielectric material includes barium titanate, titanium dioxide, diatomite, and calcium carbonate in a mass ratio of 2:1:1:1. In yet another example, the dielectric material includes barium titanate, titanium dioxide, diatomite, and calcium carbonate in a mass ratio of 3:1:1:1.

[0043] In some embodiments, the atomization matrix includes a plant material and an auxiliary material.

[0044] In some embodiments, the plant material includes a dried material from at least one of roots, stems, leaves, flowers, or fruits of a plant. In some embodiments, the plant material includes a dried material from at least one of roots, stems, leaves, flowers, or fruits of tobacco.

[0045] In some embodiments, a raw material of the plant material has been processed by at least one of a flue-curing process, a sun-curing process, an air-curing process, and a fire-curing process.

[0046] In some embodiments, the plant material is in a form of powder. For example, the plant material has a mesh size of 200 mesh to 300 mesh.

[0047] In some embodiments, a mass ratio of the plant material, the dielectric material, and the auxiliary material is 100:(3 to 25):(10 to 60).

[0048] In one embodiment, a mass ratio of the plant material to the dielectric material is 100:(3 to 25). In an example, the mass ratio of the plant material to the dielectric material is 100:3, 100:5, 100:8, 100:10, 100:12, 100:15, 100:18, 100:20, 100:22, or 100:25, or in a range defined by any two of these values. Further, the mass ratio of the plant material to the dielectric material is 100:(7 to 20).

[0049] In one embodiment, a mass ratio of the plant material to the auxiliary material is 100:(10 to 60). In an example, the mass ratio of the plant material to the auxiliary material is 100:10, 100:12, 100:15, 100:18, 100:20, 100:25, 100:28, 100:30, 100:32, 100:35, 100:38, 100:40, 100:41, 100:43, 100:45, 100:47, 100:48, 100:50, 100:52, 100:55, 100:56, 100:58, 100:59, or 100:60, or in a range defined by any two of these values. Further, the mass ratio of the plant material to the auxiliary material is 100:(20 to 50).

[0050] In some embodiments, the auxiliary material includes an atomizing agent, a characteristic providing material, and a binder.

[0051] The binder is mainly used to bond the plant material, the dielectric material, and the auxiliary material, thereby facilitating the formation of the aerosol generating product in a strip shape, a granular shape, a blocky shape, a filamentous shape, or other shapes.

[0052] In some embodiments, the binder includes at least one of sodium carboxymethylcellulose, carrageenan, xanthan gum, guar gum, agar, gelatin, sodium alginate, locust bean gum, and konjac glucomannan.

[0053] In some embodiments, the binder includes sodium carboxymethylcellulose and guar gum. In one embodiment, the binder includes sodium carboxymethylcellulose and guar gum in a mass ratio of (1 to 2):1. For example, a mass ratio of the sodium carboxymethylcellulose and the guar gum in the binder is 1:1, 1:1.2, 1:1.5, 1:1.8, or 1:2, or in a range defined by any two of these values.

[0054] In some embodiments, the mass of the binder is 8% to 15% of the mass of the plant material. In an example, the mass of the binder is 8%, 8.5%, 9%, 9.5%, 10%, 11%, 12%, 13%, 14%, or 15%, or in a range defined by any two of these values, of the mass of the plant material.

[0055] In some embodiments, the characteristic providing material includes at least one of a plant extract and a scent regulator. The characteristic providing material is capable of providing an aroma and a fragrance to the aerosol generating product. In one embodiment, the aerosol generating product has a fruit aroma, a fresh aroma, or other aromas.

[0056] In some embodiments, the plant extract is an extract from at least one of roots, stems, leaves, flowers, or fruits of a plant. In one embodiment, the extractant is a mixture of water and ethanol.

[0057] In some embodiments, a solid content of the plant extract is 60% to 75%.

[0058] In an example, the plant extract is an extract from at least one of roots, stems, leaves, flowers, or fruits of tobacco.

[0059] In some embodiments, the mass of the plant extract is 8% to 15% of the mass of the plant material. In a specific example, the mass of the plant extract is 8%, 8.5%, 9%, 9.5%, 10%, 11%, 12%, 13%, 14%, or 15%, or in a range defined by any two of these values, of the mass of the plant material.

[0060] In some embodiments, the scent regulator includes at least one of β-damascone, dihydrocoumarin, raspberry ketone, 2,3-dimethylpyrazine, α-ionone, p-anisaldehyde, megastigmatrienone, and acetylpyrazine. It should be understood that the scent regulator is not limited thereto and can be adjusted according to the actually desired aroma and fragrance of the aerosol generating product.

[0061] In some embodiments, the mass of the scent regulator is 0.1% to 0.5% of the mass of the plant material. In an example, the mass of the scent regulator is 0.1%, 0.12%, 0.15%, 0.18%, 0.2%, 0.3%, 0.4%, or 0.5%, or in a range defined by any two of these values, of the mass of the plant material.

[0062] In some embodiments, the atomizing agent includes at least one of a monohydric alcohol, and a polyhydric alcohol. The atomizing agent is capable of being atomized to produce an aerosol. For example, in one embodiment, the atomizing agent includes at least one of ethanol, propylene glycol, and glycerol. In an example, the atomizing agent includes propylene glycol and glycerol in a mass ratio of 1:(4 to 5).

[0063] In some embodiments, the shape of the aerosol generating product is not specifically limited and can be any form that can be secured to a platform for supporting the aerosol generating product. In one embodiment, the aerosol generating product is in a strip shape, a granular

shape, a blocky shape, a filamentous shape, or other shapes.

[0064] In an example, the aerosol generating product is in a granular shape. For example, the aerosol generating product is in a form of granules of 10 mesh to 15 mesh, 15 mesh to 20 mesh, 20 mesh to 25 mesh, and so on.

[0065] Microwaves at specific frequencies can generate thermal effects through a heated body, primarily due to the coupling between microwaves and polar molecules within the heated body, which leads to displacement polarization, ion polarization, and microwave dissipation, resulting in the conversion of microwave energy into heat, thereby increasing the temperature of the heated body. A quantitative factor in this process is the dielectric constant and dielectric loss of any heated body. The material with a high dielectric constant is more effective at absorbing microwaves and dissipating microwaves to some extent to achieve the heating effect. In the present embodiments, the aforementioned dielectric material with a dielectric constant that does not change with temperature is added into the aerosol generating product, which slows down the rate of change of the dielectric constant of the aerosol generating product during microwave heating, thereby promoting the stability of microwave heating and improving the consistency of sensory quality before and after puffing. Furthermore, compared to other dielectric materials, the incorporation of the aforementioned dielectric material does not affect the puffing flavor of the aerosol generating product.

[0066] Additionally, each of the components of the aforementioned dielectric material exhibits the dielectric property. By adjusting the ratio of the components, the dielectric constant of the aerosol generating product can be regulated, such that the aerosol generating product exhibits more beneficial coupling performance with microwave heating, better heating efficiency, and sensory quality performances.

[0067] The present application further provides an embodiment of a method for preparing an aerosol generating product, includes the following step:

> mixing and shaping a dielectric material and an atomization matrix to obtain the aerosol generating product;
> wherein the dielectric material includes at least one of modified or unmodified barium titanate, diatomite, calcium carbonate, and titanium dioxide.

[0068] Specific dielectric material and atomization matrix are described previously and will not be repeated.

[0069] The present application further provides an embodiment of an electronic atomization apparatus, including a microwave generator and the aerosol generating product. The microwave generator is configured to heat the aerosol generating product.

[0070] Specific aerosol generating product is described previously and will not be repeated.

[0071] In order to make objectives and advantages of the present application clearer, the aerosol generating product in the present application and the effects thereof will be further described in detail below in conjunction with specific examples. It should be understood that the specific examples described herein are only used to illustrate the present application and are not intended to limit the scope of the present application. The following examples do not include components other than unavoidable impurities unless otherwise stated. The reagents or instruments used in the examples are conventional products in the art unless otherwise specifically stated. The experimental methods for which specific conditions are not indicated in the examples are implemented according to conventional conditions, such as those described in the literature, in books, or as recommended by the manufacturer.

Example 1

[0072] This example provides an aerosol generating product. The aerosol generating product is a granular matrix of 10 mesh to 15 mesh, with a moisture content of 4%±1% by mass.

[0073] The aerosol generating product in this example consists of a dielectric material, an auxiliary material, and a plant material in a mass ratio of 10:36.2:100.

[0074] The dielectric material consists of diatomite, calcium carbonate, and barium titanate in a mass ratio of 1:1:1. The mass of the dielectric material is 10% of the mass of the plant material.

[0075] The plant material in the aerosol generating product consists of dried stems, dried leaves, and dried flowers of tobacco that have been processed by the combination of a flue-curing process, a sun-curing process and an air-curing process, with a moisture content of 8% by mass and a mesh size of 200 mesh. A mass ratio of stems, leaves, and flowers is 1:3:1. The plant material serves as the primary component of the aerosol generating product.

[0076] The auxiliary material in the aerosol generating product consists of an atomizing agent, a binder and a characteristic providing material. The atomizing agent consists of 1,2-propanediol and glycerol in a mass ratio of 1:4. The mass of the atomizing agent is 18% of the mass of the plant material.

[0077] The binder in the auxiliary material is a 3% glue solution prepared from sodium carboxymethylcellulose and guar gum in a mass ratio of 1:1, with water as a solvent. The mass of the binder is 9% of the mass of the plant material.

[0078] The characteristic providing material in the auxiliary material consists of a plant extract and a scent regulator. The plant extract is an extract from roots, stems, leaves, and flowers of tobacco that have been processed by the combination of a flue-curing process, a sun-curing process and an air-curing process. A mixed solvent of water and ethanol is used as an extraction

solvent, and an infusion method is used for extraction. The solid content of the plant extract is 60% to 75%. The mass of the plant extract is 9% of the mass of the plant material. The scent regulator in the characteristic providing material consists of four materials: 2,3-dimethylpyrazine with a roasted aroma, α-ionone with a flower aroma, dihydrocoumarin with a bean aroma, and raspberry ketone with a fruit aroma, which is adjusted to have the roasted aroma as the main aroma. A mass ratio of 2,3-dimethylpyrazine, α-ionone, dihydrocoumarin, and raspberry ketone in the scent regulator is 5:1:0.5:1.2. The mass of the scent regulator is 0.2% of the mass of the plant material.

[0079] The aerosol generating product in this example is prepared by a method including the step of mixing and granulating the dielectric material, the auxiliary material, and the plant material to obtain the aerosol generating product.

[0080] The microwave heating effect of the aerosol generating product in this example is shown in FIG. 1. The curves in the figure represent temperature, voltage, and microwave frequency, respectively. The troughs in the temperature curve are temperatures at puffing, and the interval between two troughs represents the temperature recovery and stabilization phase.

[0081] The experiment has demonstrated that the aerosol generating product maintains a stable temperature during microwave heating, with no temperature decay in the later heating stage, which results in a high degree of heating completeness for the aerosol generating product, a high release efficiency of the aerosol primary component, and a good consistency before and after puffing, thereby enhancing the puffing experience.

Example 2

[0082] This example provides an aerosol generating product. The aerosol generating product is a granular matrix of 15 mesh to 20 mesh, with a moisture content of 4.5%±1% by mass.

[0083] The aerosol generating product in this example consists of a dielectric material, an auxiliary material, and a plant material in a mass ratio of 13:36.2:100.

[0084] The dielectric material consists of four materials: titanium dioxide, diatomite, calcium carbonate, and barium titanate in a mass ratio of 1:1:1:2. The mass of the dielectric material is 13% of the mass of the plant material.

[0085] The plant material in the aerosol generating product consists of dried stems, dried leaves, and dried flowers of tobacco that have been processed by the combination of a flue-curing process, a sun-curing process and an air-curing process, with a moisture content of 8% by mass and a mesh size of 200 mesh. A mass ratio of stems, leaves, and flowers is 1:3:2. The plant material serves as the primary component of the aerosol generating product.

[0086] The auxiliary material in the aerosol generating product consists of an atomizing agent, a binder and a characteristic providing material. The atomizing agent consists of 1,2-propanediol and glycerol in a mass ratio of 1:5. The mass of the atomizing agent, as the main component of the aerosol generating product to produce aerosol, is 18% of the mass of the plant material.

[0087] The binder in the auxiliary material of the aerosol generating product is a 2.5% glue solution prepared from sodium carboxymethylcellulose and guar gum in a mass ratio of 2:1, with water as a solvent. The mass of the binder, as an adhesive for the plant material and the dielectric material, is 9% of the mass of the plant material.

[0088] The characteristic providing material in the auxiliary material of the aerosol generating product consists of a plant extract and a scent regulator. The plant extract is an extract from roots, stems, leaves, and flowers of tobacco that have been processed by the combination of a flue-curing process, a sun-curing process and an air-curing process. A mixed solvent of water and ethanol is used as an extraction solvent, and an infusion method is used for extraction. The solid content of the plant extract is 60% to 75%. The mass of the plant extract is 9% of the mass of the plant material. The scent regulator in the characteristic providing material consists of three materials: β-damascone with a fresh aroma, dihydrocoumarin with a bean aroma, and raspberry ketone with a fruit aroma, which is adjusted to have the fresh aroma as the main aroma. A mass ratio of β-damascone, dihydrocoumarin, and raspberry ketone in the scent regulator is 10:2:0.7. The mass of the scent regulator is 0.2% of the mass of the plant material.

[0089] The aerosol generating product in this example is prepared by a method including the step of mixing and granulating the dielectric material, the auxiliary material, and the plant material to obtain the aerosol generating product.

[0090] The microwave heating effect of the aerosol generating product in this example is shown in FIG. 2. The curves in the figure represent temperature, voltage, and microwave frequency, respectively. The troughs in the temperature curve are temperatures at puffing, and the interval between two troughs represents the temperature recovery and stabilization phase.

[0091] The experiment has demonstrated that the aerosol generating product maintains a stable temperature during microwave heating, with no temperature decay in the later heating stage, which results in a high degree of heating completeness for the aerosol generating product, a high release efficiency of the aerosol primary component, and a good consistency before and after puffing, thereby enhancing the puffing experience.

Example 3

[0092] This example provides an aerosol generating product. The aerosol generating product is a granular

matrix of 20 mesh to 25 mesh, with a moisture content of 5%±1% by mass.

[0093] The aerosol generating product in this example consists of a dielectric material, an auxiliary material, and a plant material in a mass ratio of 15:40.5:100.

[0094] The dielectric material in the aerosol generating product consists of four materials: titanium dioxide, diatomite, calcium carbonate, and barium titanate in a mass ratio of 1:1:1:3. The mass of the dielectric material is 15% of the mass of the plant material.

[0095] The plant material in the aerosol generating product consists of dried stems, dried leaves, and dried flowers of tobacco that have been processed by the combination of a flue-curing process, a sun-curing process and an air-curing process, with a moisture content of 8% by mass and a mesh size of 200 mesh. A mass ratio of stems, leaves, and flowers is 1:4:2. The plant material serves as the primary component of the aerosol generating product matrix.

[0096] The auxiliary material in the aerosol generating product consists of an atomizing agent, a binder and a characteristic providing material. The atomizing agent consists of 1,2-propanediol and glycerol in a mass ratio of 1:5. The mass of the atomizing agent, as the main component of the aerosol generating product to produce aerosol, is 18% of the mass of the plant material.

[0097] The binder in the auxiliary material of the aerosol generating product is a 2.5% glue solution prepared from sodium carboxymethylcellulose and guar gum in a mass ratio of 2:1, with water as a solvent. The mass of the binder, as an adhesive for the plant material and the dielectric material, is 11% of the mass of the plant material.

[0098] The characteristic providing material in the auxiliary material of the aerosol generating product consists of a plant extract and a scent regulator. The plant extract is an extract from roots, stems, leaves, and flowers of tobacco that have been processed by the combination of a flue-curing process, a sun-curing process and an air-curing process. A mixed solvent of water and ethanol is used as an extraction solvent, and an infusion method is used for extraction. The solid content of the plant extract is 60% to 75%. The mass of the plant extract is 11% of the mass of the plant material. An aroma extract in the auxiliary material of aerosol generating product consists of three materials: p-anisaldehyde with a spice aroma, megastigmatrienone with a tobacco aroma, and acetylpyrazine with a toasted aroma, which is adjusted to have the spice aroma as the main aroma. A mass ratio of p-anisaldehyde, megastigmatrienone, and acetylpyrazine in the scent regulator is 7:2.4:0.9. The mass of the scent regulator is 0.5% of the mass of the plant material.

[0099] The aerosol generating product in this example is prepared by a method including the step of mixing and granulating the dielectric material, the auxiliary material, and the plant material to obtain the aerosol generating product.

[0100] The microwave heating effect of the aerosol generating product in this example is shown in FIG. 3. The curves in the figure represent temperature, voltage, and microwave frequency, respectively. The troughs in the temperature curve are temperatures at puffing, and the interval between two troughs represents the temperature recovery and stabilization phase.

[0101] The experiment has demonstrated that the aerosol generating product maintains a stable temperature during microwave heating, with no temperature decay in the later heating stage, which results in a high degree of heating completeness for the aerosol generating product, a high release efficiency of the aerosol primary component, and a good consistency before and after puffing, thereby enhancing the puffing experience.

Comparative Example 1

[0102] Comparative Example 1 provides an aerosol generating product, which differs from Example 1 in that no dielectric material is added.

[0103] The experiment has demonstrated that the aerosol generating product in Comparative Example 1 shows a serious temperature decay in the later heating stage, so that the temperature cannot be maintained, the number of puffs is significantly reduced, and the puffing experience is poor.

[0104] The microwave heating effect of the aerosol generating product in Comparative Example 1 is shown in FIG. 4. The curves in the figure represent temperature, voltage, and microwave frequency, respectively.

[0105] The technical features of the above-mentioned embodiments can be combined arbitrarily. In order to make the description concise, not all possible combinations of the technical features are described in the embodiments. However, as long as there is no contradiction in the combination of these technical features, the combinations should be considered as in the scope of the present application.

[0106] The above-described embodiments are only several implementations of the present application, and the descriptions are relatively specific and detailed, but they should not be construed as limiting the scope of the present application. It should be understood by those of ordinary skill in the art that various modifications and improvements can be made without departing from the concept of the present application, and all fall within the protection scope of the present application. Therefore, the patent protection of the present application shall be defined by the appended claims.

Claims

1. An aerosol generating product, comprising a dielectric material and an atomization matrix, wherein the dielectric material comprises at least one of modified or unmodified barium titanate, calcium carbonate,

diatomite, and titanium dioxide.

2. The aerosol generating product according to claim 1, wherein the dielectric material comprises modified or unmodified barium titanate.

3. The aerosol generating product according to any one of claims 1 to 2, wherein the dielectric material comprises modified or unmodified barium titanate, titanium dioxide, diatomite, and calcium carbonate in a mass ratio of (10 to 25):(0 to 10):(1 to 25):(5 to 30).

4. The aerosol generating product according to claim 3, wherein the dielectric material comprises modified or unmodified barium titanate, titanium dioxide, diatomite, and calcium carbonate in a mass ratio of (12 to 20):(1 to 8):(3 to 15):(6 to 20).

5. The aerosol generating product according to any one of claims 1 to 4, wherein a dielectric constant of the dielectric material is greater than or equal to 2.

6. The aerosol generating product according to any one of claims 1 to 5, wherein the atomization matrix comprises a plant material and an auxiliary material;

the plant material comprises a dried material from at least one of roots, stems, leaves, flowers, or fruits of a plant;
the auxiliary material comprises an atomizing agent, a characteristic providing material, and a binder.

7. The aerosol generating product according to claim 6, wherein a mass ratio of the plant material, the dielectric material, and the auxiliary material is 100:(3 to 25):(10 to 60).

8. The aerosol generating product according to claim 7, wherein a mass ratio of the plant material to the dielectric material is 100:(7 to 20), and a mass ratio of the plant material to the auxiliary material is 100:(20 to 50).

9. The aerosol generating product according to any one of claims 6 to 8, wherein a raw material of the plant material has been processed by at least one of a flue-curing process, a sun-curing process, an air-curing process, and a fire-curing process.

10. The aerosol generating product according to any one of claims 6 to 9, wherein the characteristic providing material comprises at least one of a plant extract and a scent regulator.

11. The aerosol generating product according to claim 10, wherein the plant extract is an extract from at least one of roots, stems, leaves, flowers, or fruits of a plant, and a mass of the plant extract is 8% to 15% of a mass of the plant material.

12. The aerosol generating product according to claim 10 or 11, wherein a solid content of the plant extract is 60% to 75%.

13. The aerosol generating product according to any one of claims 10 to 12, wherein the scent regulator comprises at least one of β-damascone, dihydrocoumarin, raspberry ketone, 2,3-dimethylpyrazine, α-ionone, p-anisaldehyde, megastigmatrienone, and acetylpyrazine.

14. The aerosol generating product according to any one of claims 10 to 13, wherein a mass of the scent regulator is 0.1% to 0.5% of a mass of the plant material.

15. The aerosol generating product according to any one of claims 6 to 14, wherein the binder comprises at least one of sodium carboxymethylcellulose, carrageenan, xanthan gum, guar gum, agar, gelatin, sodium alginate, locust bean gum, and konjac glucomannan.

16. The aerosol generating product according to claim 15, wherein the binder comprises sodium carboxymethylcellulose and guar gum in a mass ratio of (1 to 2): 1.

17. The aerosol generating product according to any one of claims 6 to 16, wherein a mass of the binder is 8% to 15% of a mass of the plant material.

18. The aerosol generating product according to any one of claims 6 to 17, wherein the atomizing agent comprises propylene glycol and glycerol in a mass ratio of 1:(4 to 5).

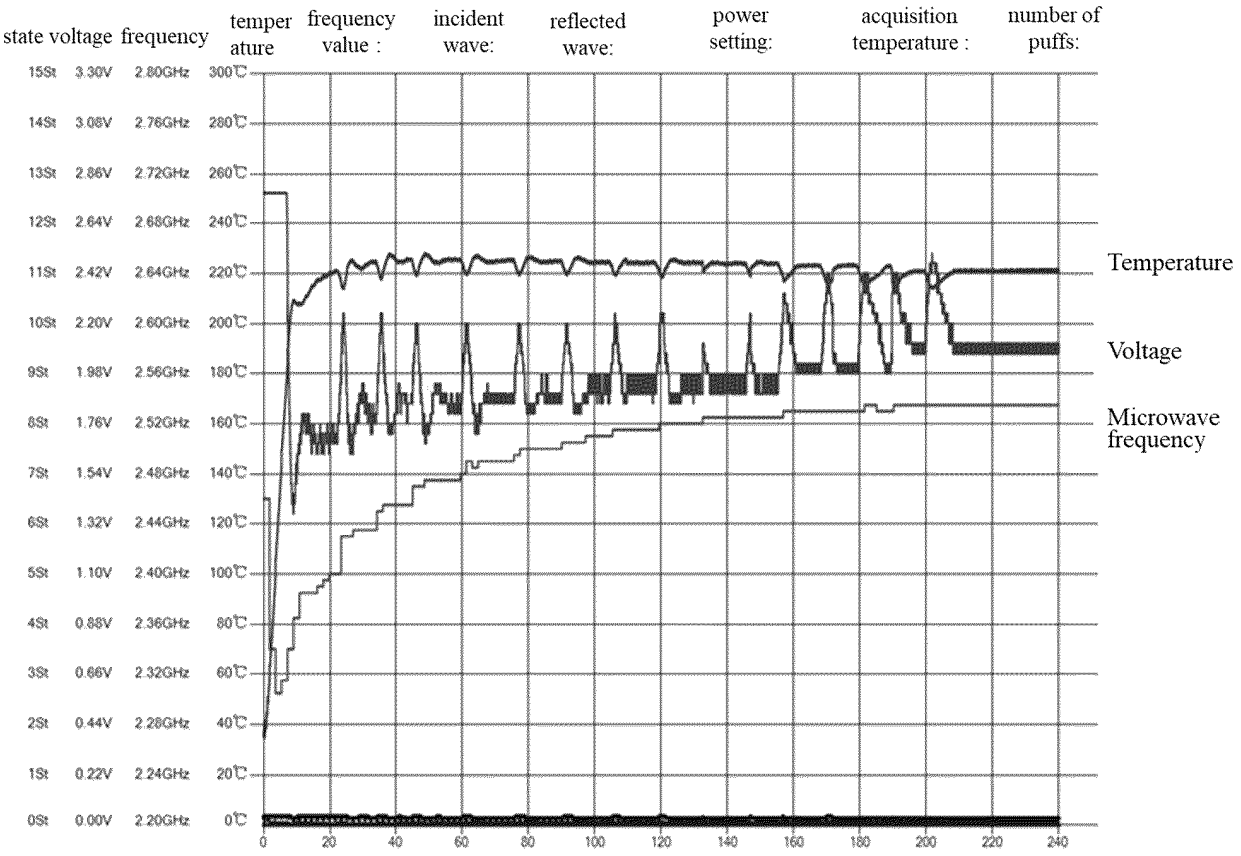
19. The aerosol generating product according to any one of claims 1 to 18, wherein a shape of the aerosol generating product comprises a strip shape, a granular shape, a blocky shape, or a filamentous shape.

20. A method for preparing an aerosol generating product, comprising the following step:

mixing and shaping a dielectric material and an atomization matrix to obtain the aerosol generating product;
wherein the dielectric material comprises at least one of modified or unmodified barium titanate, diatomite, calcium carbonate, and titanium dioxide.

21. An electronic atomization apparatus, comprising a microwave generator and the aerosol generating

product of any one of claims 1 to 19, wherein the microwave generator is configured to heat the aerosol generating product.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11St 2.42V 2.64GHz 220℃
10St 2.20V 2.60GHz 200℃
9St 1.98V 2.56GHz 180℃
8St 1.76V 2.52GHz 160℃
7St 1.54V 2.48GHz 140℃
6St 1.32V 2.44GHz 120℃
5St 1.10V 2.40GHz 100℃
4St 0.88V 2.36GHz 80℃
3St 0.66V 2.32GHz 60℃
2St 0.44V 2.28GHz 40℃
1St 0.22V 2.24GHz 20℃
0St 0.00V 2.20GHz 0℃
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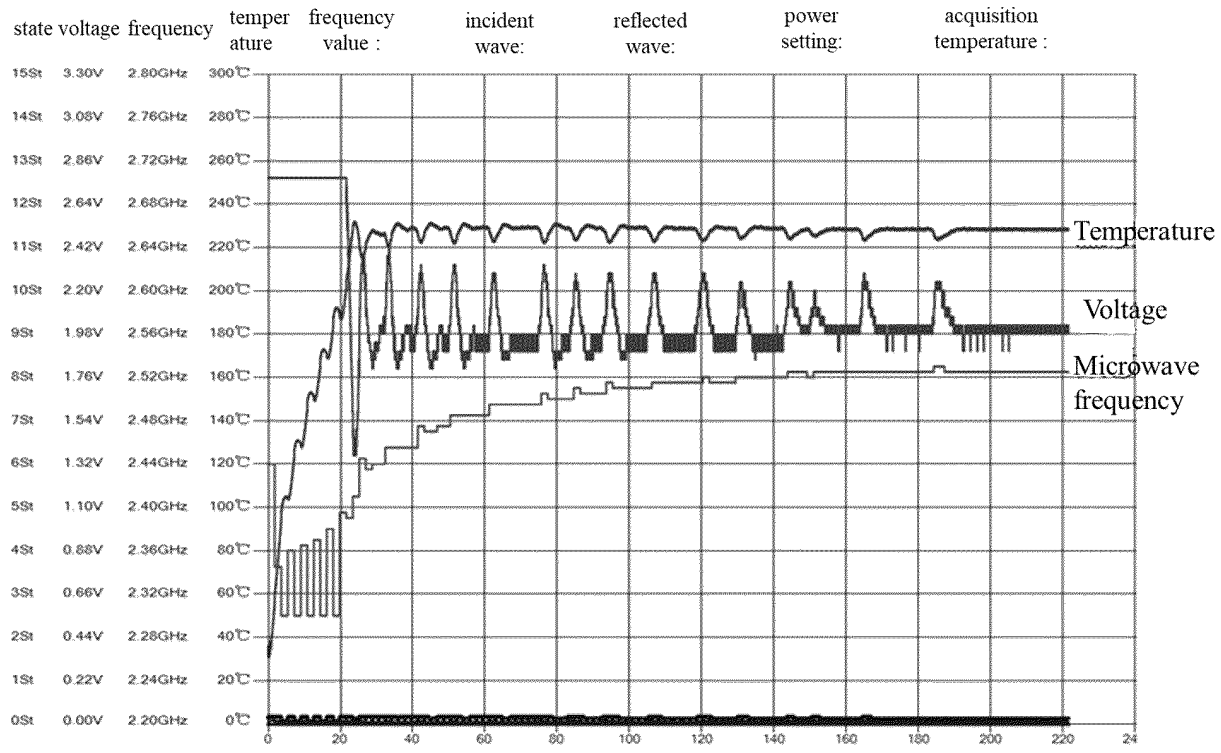
Temperature
Voltage
Microwave frequency

FIG. 1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5St 1.10V 2.40GHz 100℃
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3St 0.66V 2.32GHz 60℃
2St 0.44V 2.28GHz 40℃
1St 0.22V 2.24GHz 20℃
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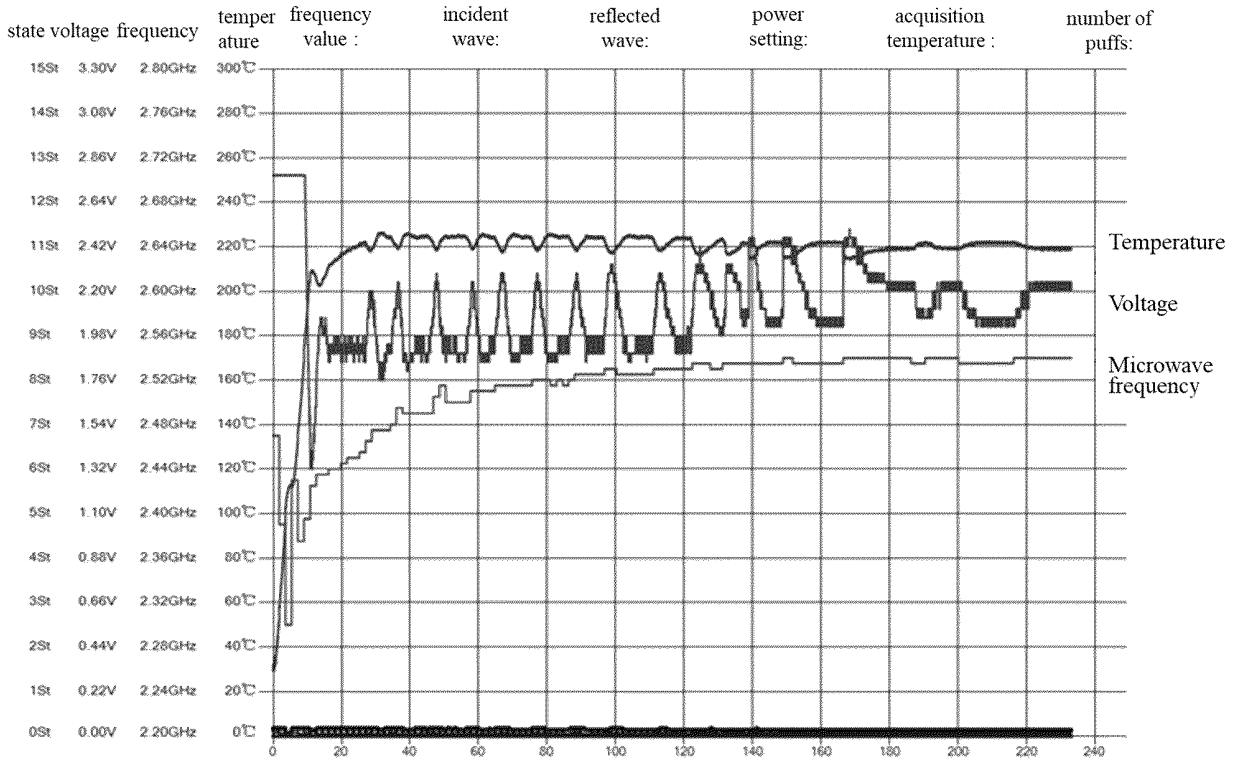
0 20 40 60 80 100 120 140 160 180 200 220
Temperature
Voltage
Microwave frequency

FIG. 2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temper ature
frequency value :
incident wave:
reflected wave:
power setting:
acquisition temperature :
number of puffs:
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14St 3.08V 2.76GHz 280℃
13St 2.86V 2.72GHz 260℃
12St 2.64V 2.68GHz 240℃
11St 2.42V 2.64GHz 220℃
10St 2.20V 2.60GHz 200℃
9St 1.98V 2.56GHz 180℃
8St 1.76V 2.52GHz 160℃
7St 1.54V 2.48GHz 140℃
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4St 0.88V 2.36GHz 80℃
3St 0.66V 2.32GHz 60℃
2St 0.44V 2.28GHz 40℃
1St 0.22V 2.24GHz 20℃
0St 0.00V 2.20GHz 0℃
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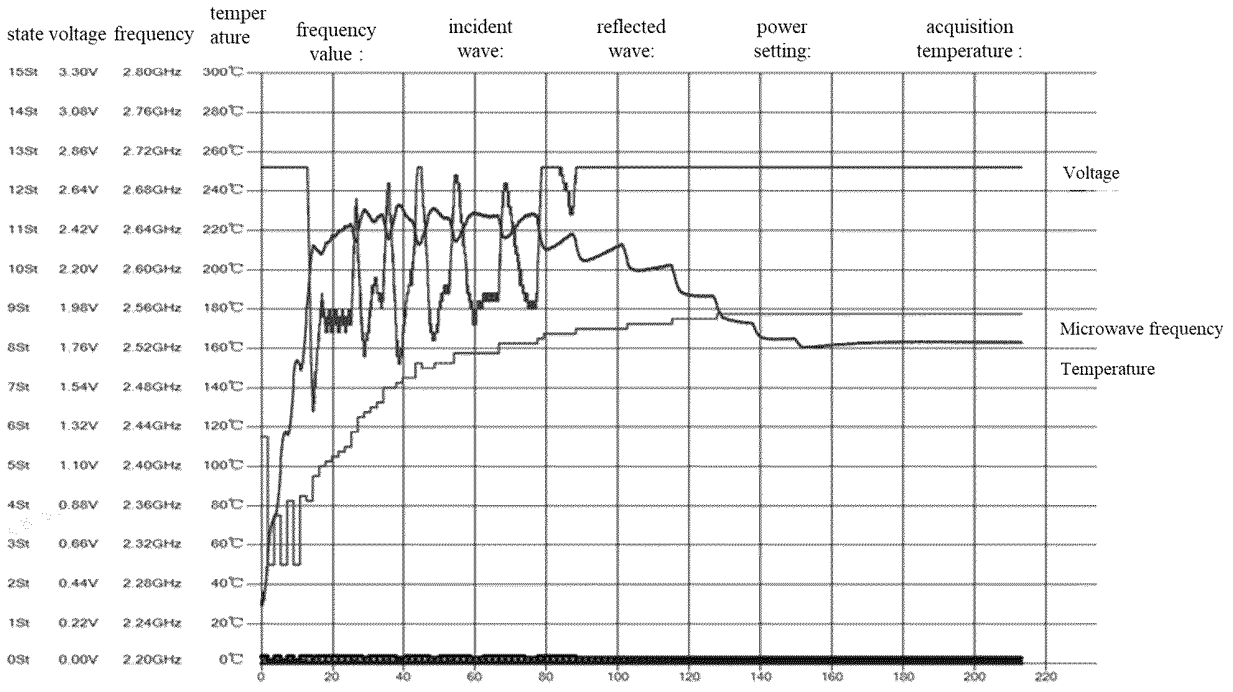
Temperature
Voltage
Microwave frequency

FIG. 3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13St 2.86V 2.72GHz 260℃
12St 2.64V 2.68GHz 240℃
11St 2.42V 2.64GHz 220℃
10St 2.20V 2.60GHz 200℃
9St 1.98V 2.56GHz 180℃
8St 1.76V 2.52GHz 160℃
7St 1.54V 2.48GHz 140℃
6St 1.32V 2.44GHz 120℃
5St 1.10V 2.40GHz 100℃
4St 0.88V 2.36GHz 80℃
3St 0.66V 2.32GHz 60℃
2St 0.44V 2.28GHz 40℃
1St 0.22V 2.24GHz 20℃
0St 0.00V 2.20GHz 0℃
0 20 40 60 80 100 120 140 160 180 200 220
Voltage
Microwave frequency
Temperature

FIG. 4

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2023/107227

A. CLASSIFICATION OF SUBJECT MATTER

A24F40/20(2020.01)i; A24F40/42(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)

IPC:A24F40,A24F47,A24D

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)

CJFD, CNTXT, ENTXT, WPABS: 气溶胶, 丙二醇, 丙三醇, 刺槐豆胶, 大茴香醛, 二甲基吡嗪, 二氢大马酮, 二氢香豆素, 二氧化钛, 覆盆子酮, 瓜尔豆胶, 硅藻土, 海藻酸钠, 黄原胶, 介电材料, 巨豆三烯酮, 卡拉胶, 明胶, 魔芋胶, 琼脂, 碳酸钙, 微波, 雾化剂, 香味, 烟, 烟草, 乙酰基吡嗪, 粘合剂, 植物, 紫罗兰酮, 钛酸钡, 羧甲基纤维素钠, aerosol, wave-transmitting material, dielectric material, atomiz+, cigarette, tobacco, plant, aromat+

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	WO 2023023987 A1 (SHENZHEN SMOORE TECHNOLOGY LTD.; SHENZHEN MERIT TECHNOLOGY CO., LTD.) 02 March 2023 (2023-03-02) claims 1-10	1-5, 20, 21
X	CN 114468376 A (HUBEI CHINA TOBACCO INDUSTRY CO., LTD.) 13 May 2022 (2022-05-13) description, paragraph 42, and figures 1 and 2	1-5, 20, 21
Y	CN 114468376 A (HUBEI CHINA TOBACCO INDUSTRY CO., LTD.) 13 May 2022 (2022-05-13) description, paragraph 42, and figures 1 and 2	6-19, 21
X	CN 113974229 A (HUBEI CHINA TOBACCO INDUSTRY CO., LTD.) 28 January 2022 (2022-01-28) description, paragraph 29	1-5, 20, 21

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

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"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"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	Date of mailing of the international search report
24 August 2023	**24 August 2023**
Name and mailing address of the ISA/CN **China National Intellectual Property Administration (ISA/CN)** **China No. 6, Xitucheng Road, Jimenqiao, Haidian District, Beijing 100088**	Authorized officer Telephone No.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2023/107227

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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X	CN 114468350 A (HUBEI CHINA TOBACCO INDUSTRY CO., LTD.) 13 May 2022 (2022-05-13) description, paragraphs 19-21	1-5, 20, 21
Y	CN 114468350 A (HUBEI CHINA TOBACCO INDUSTRY CO., LTD.) 13 May 2022 (2022-05-13) description, paragraphs 19-21	6-19, 21
Y	US 2020093181 A1 (RAI STRATEGIC HOLDINGS INC.) 26 March 2020 (2020-03-26) description, paragraphs 76-80, claims 1-27, and figures 1-3	6-19, 21
Y	WO 2022084680 A1 (NICOVENTURES TRADING LTD.) 28 April 2022 (2022-04-28) description, paragraphs 33-77	6-19, 21
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A	CN 114391670 A (SHENZHEN MAISHI TECHNOLOGY CO., LTD.) 26 April 2022 (2022-04-26) entire document	1-21

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2023/107227

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CN 114391670 A	26 April 2022	None	

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REFERENCES CITED IN THE DESCRIPTION

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