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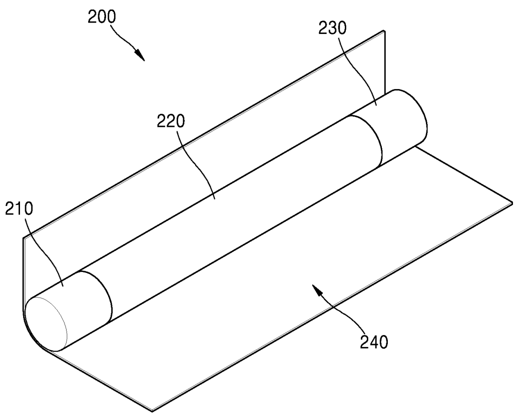
(54) ARTICLE FOR GENERATING AEROSOL, AND METHOD FOR MANUFACTURING ARTICLE FOR GENERATING AEROSOL

(57) An aerosol-generating article may include a heat transfer unit that transfers heat to a medium unit to generate aerosol, and a method of manufacturing the aerosol-generating article may include producing the heat transfer unit that transfers heat to the medium unit to generate aerosol.

FIG. 2



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Description

TECHNICAL FIELD

[0001] The present disclosure relates to an article for generating aerosol and a method of manufacturing the article for generating aerosol.

BACKGROUND ART

[0002] Recently, the demand for alternative methods to overcome the shortcomings of general cigarettes has increased. For example, there is an increasing demand for a method of generating aerosol by heating an aerosol-generating material, rather than by burning cigarettes. Accordingly, research into heating-type cigarettes or heating-type aerosol-generating devices has been actively conducted.

DESCRIPTION OF EMBODIMENTS

TECHNICAL PROBLEM

[0003] Provided are a segment that transfers heat to a material generating aerosol in an article generating aerosol and a method of manufacturing the same.

[0004] The technical problems to be solved by the present embodiment are not limited to the technical problems as described above, and other technical problems may be driven from the following embodiments.

SOLUTION TO PROBLEM

[0005] According to an aspect of the disclosure, an aerosol-generating article includes: a heat transfer unit that includes structure particles and a binder, wherein each of the structure particles contains carbon and the binder adheres to surfaces of the structure particles and supports the structure particles to form pores between the structure particles; and a medium unit that includes solid particles and heat transfer materials, wherein the solid particles generate an aerosol and the heat transfer materials are mixed with the solid particles and transfer heat to the solid particles.

[0006] In the aerosol-generating article, the medium unit may further include a binder that adheres to surfaces of the solid particles and supports the solid particles to form pores between the solid particles.

[0007] In the aerosol-generating article, the binder may include any one of carboxymethyl cellulose, hydroxypropyl methylcellulose, pullulan, and starch.

[0008] In the aerosol-generating article, the structure particles may include any one of activated carbon, carbon nanotubes, graphene, a polymer substrate having a thermal conductivity of 0.1 W/mK or more and a metal material having a thermal conductivity of 10.0 W/mK or more.

[0009] In the aerosol-generating article, the heat transfer material may include any one of activated carbon, carbon nanotubes, graphene, a polymer substrate having a thermal conductivity of 0.1 W/mK or more and a metal material having a thermal conductivity of 10.0 W/mK or more.

[0010] In the aerosol-generating article, one side of the medium unit may be connected to the heat transfer unit, the aerosol-generating article may further comprise a mouthpiece unit connected to the other side of the medium unit, and when heat in a temperature range of about 250 °C to about 350 °C is applied to an end portion of the heat transfer unit, a temperature range of a portion where the heat transfer unit and the medium unit contact each other is about 220 °C to about 320 °C, a temperature range of a portion where the medium unit and mouthpiece unit contact each other is about 70 °C to about 100 °C, and a temperature range of an end portion of the mouthpiece unit is about 40 °C to about 70 °C.

[0011] According to another aspect of the disclosure, a method of manufacturing an aerosol-generating article includes: forming a heat transfer unit by mixing a binder and structure particles containing carbon so that the binder adheres to surfaces of the structure particles and pores are formed between the structure particles; forming a medium unit by mixing solid particles to generate aerosol and heat transfer material to transfer to the solid particles; and connecting the heat transfer unit and the medium unit and wrapping the heat transfer unit and the medium unit with an outer wrapper.

[0012] In the method, the forming of the medium unit may include mixing a binder together with the solid particles and the heat transfer material so that the binder adheres to surfaces of the solid particles and pores are formed between the solid particles.

[0013] In the method, a suction resistance of a mixture of the structure particles and the binder may be 50 mmH_2O/30 mm or less.

ADVANTAGEOUS EFFECTS OF DISCLOSURE

[0014] The point adhesions between the structure particles and the binder may be advantageous for forming a high porosity in a small volume. In addition, a porosity of the structure particles may be increased by using a small amount of the binder, and a hardness of the structure particles may be improved.

[0015] By forming the point adhesions between the binder and particles of the heat transfer unit and the medium unit, the porosity may be increased, and thus the suction resistance of the heat transfer unit may be reduced.

BRIEF DESCRIPTION OF DRAWINGS

[0016]

FIG. 1 is a diagram illustrating an article generating aerosol according to some embodiments.

FIG. 2 is a diagram illustrating an aerosol-generating article including a heat transfer unit according to some embodiments.

FIG. 3 is a diagram for illustrating a process in which pores are formed through point adhesions between structure particles containing carbon and a binder according to some embodiments.

FIG. 4 is a graph illustrating temperatures according to locations in an aerosol-generating article according to some embodiments.

FIG. 5 is a flowchart of a method of manufacturing an aerosol-generating article having a heat transfer unit according to some embodiments.

BEST MODE

[0017] An aerosol-generating article includes: a heat transfer unit that includes structure particles and a binder, wherein each of the structure particles contains carbon and the binder adheres to surfaces of the structure particles and supports the structure particles to form pores between the structure particles; and a medium unit that includes solid particles and heat transfer materials, wherein the solid particles generate an aerosol and the heat transfer materials are mixed with the solid particles and transfer heat to the solid particles.

MODE OF DISCLOSURE

[0018] With respect to the terms used to describe the various embodiments, general terms which are currently and widely used are selected in consideration of functions of structural elements in the various embodiments of the present disclosure. However, meanings of the terms may be changed according to intention, a judicial precedence, the appearance of new technology, and the like. In addition, in certain cases, terms which are not commonly used may be selected. In such a case, the meanings of the terms will be described in detail at the corresponding portions in the following descriptions. Therefore, the terms used in the various embodiments should be defined based on the meanings of the terms and the descriptions provided herein.

[0019] Throughout the specification, when there is a description about a case in which a part is connected to another part, this includes not only the case of being directly connected, but also the case of being electrically connected with another element therebetween. In addition, unless explicitly described to the contrary, the word "comprise" and variations such as "comprises" or "comprising" will be understood to imply the inclusion of stated elements but not the exclusion of any other elements.

[0020] Hereinafter, the present disclosure will now be described more fully with reference to the accompanying drawings, in which exemplary embodiments of the present disclosure are shown such that one of ordinary skill in the art may easily work the present disclosure. The disclosure may, however, be embodied in many different forms and should not be construed as being limited to the embodiments set forth herein.

[0021] In the embodiments, an "aerosol-generating material" may mean a material capable of generating aerosol and may also mean an aerosol-forming substrate. The aerosol may include volatile compounds. The aerosol-generating material may be solid or liquid.

[0022] For example, the solid aerosol-generating material may include a solid material based on tobacco raw materials such as a tobacco sheet, shredded tobacco, reconstituted tobacco, and the liquid aerosol-generating material may include a liquid material based on nicotine, tobacco extract and various flavoring agents. The disclosure is not limited to the above example.

[0023] In the present embodiments, the "aerosol-generating device" may be a device that generates an aerosol using an aerosol-generating material in order to generate an aerosol that is directly in-halable into a user's lungs through the user's mouth. For example, the aerosol-generating device may be a holder that is holdable by a user.

[0024] Hereinafter, the embodiments will now be described in detail with reference to the accompanying drawings.

[0025] FIG. 1 is a diagram illustrating an article generating aerosol according to some embodiments.

[0026] Referring to FIG. 1, an aerosol-generating article 100 may include an aerosol-generating material 110, an intermediate structure 120, a cooling structure 130, a filter segment 140, and a wrapper 150.

[0027] The aerosol-generating material 110 may include at least one of glycerin, propylene glycol, ethylene glycol, dipropylene glycol, diethylene glycol, triethylene glycol, tetraethylene glycol, and oleyl alcohol.

[0028] The aerosol-generating material 110 may have an elongated rod shape, and the length of the aerosol-generating material 110 may vary. For example, the length of the aerosol-generating material 110 may be 7 mm to 15 mm, but the disclosure is not limited thereto. In some examples, the length of the aerosol-generating material 110 may be about 12 mm. In addition, the diameter of the aerosol-generating material 100 may be about 7 mm to about 9 mm, but the disclosure is not limited thereto. In some examples, the diameter of the aerosol-generating material 110 may be about 7.9 mm.

[0029] Optionally, the aerosol-generating material 110 may contain other additive material such as a flavoring agent, a wetting agent and/or acetate compounds. For example, the flavoring agent may include licorice, sucrose, fructose syrup, isosweet, cocoa, lavender, cinnamon, cardamom, celery, fenugreek, cascarilla, sandalwood, bergamot, geranium, honey essence, rose oil, vanilla, lemon oil, orange oil, mint oil, caraway, cognac, jasmine, chamomile, menthol, cassia bark, ylang ylang, salvia, spearmint, ginger, coriander, coffee, or the like. In addition, the wetting agent may include glycerin, propylene glycol, or the like.

[0030] For example, a tobacco raw material may be pulverized and then mixed with a solvent and various additives to be manufactured slurry, and then the slurry may be dried to form a sheet. After forming the sheet, a plurality of tobacco material strands may be formed by processing the sheet.

[0031] For example, the aerosol-generating material 110 may include the plurality of tobacco material strands, and each of the plurality of tobacco material strands may have a length of about 10 mm to about 14 mm, for example, 12 mm, a width of about 0.8 mm to about 1.2 mm, for example, 1 mm, and a thickness of about 0.08 mm to about 0.12 mm, for example, 0.1 mm. However, the length, the width, and the thickness of each of the plurality of tobacco material strands are not limited to the above examples.

[0032] As the aerosol-generating material 110 includes a plurality of strand materials formed by processing a wide tobacco sheet, a density of a tobacco materials filled in the aerosol-generating material 110 may be increased. Accordingly, the amount of the aerosol generated from the aerosol-generating material 110 may be increased, and manufacturing characteristics of the aerosol-generating material 110 may be improved.

[0033] The filter segment 140 may be arranged side by side with the aerosol-generating material 110, and the aerosol material generated from the aerosol-generating material 110 passes through the filter segment 140 immediately before being inhaled by the user.

[0034] The filter segment 140 may be formed of various materials. For example, the filter segment 140 may include cellulose acetate. The filter segment 140 may be made as a cylindrical filter, a tubular filter including a hollow, or a recessed filter, but the disclosure is not limited thereto. For example, the length of the filter segment 140 may be about 5 mm to about 15 mm, but the disclosure is not limited thereto.

[0035] Also, the filter segment 140 may include at least one capsule (not shown). The capsule included in the filter segment 140 may have a configuration in which a content liquid containing a flavoring material is wrapped with a film. For example, the capsule has a spherical or cylindrical shape.

[0036] In addition, a material for forming the film of the capsule included in the filter segment 140 may be starch and/or a gelling agent. For example, a gelling gum or gelatin may be used as the gelling agent. Also, a gelling aid may be further used as the material for forming the film of the capsule. For example, calcium chloride may be used as the gelling aid. Also, a plasticizer may be further used as the material for forming the film of the capsule. Glycerin and/or sorbitol may be used as the plasticizer. Also, a coloring agent may be further used as the material for forming the film of the capsule.

[0037] For example, menthol, plant essential oil, and the like may be used as the flavoring material contained in the content liquid of the capsule. In addition, as the solvent of the flavoring material contained in the content liquid, for example, a medium chain fatty acid triglyceride (MCT) may be used. In addition, the content liquid may contain other additives such as a pigment, an emulsifier, and a thickener.

[0038] The intermediate structure 120 is arranged between the filter segment 140 and the aerosol-generating material 110. For example, the intermediate structure 120 may be arranged adjacent to the aerosol-generating material 110. The intermediate structure 120 may be formed from various materials. For example, the intermediate structure 120 may include cellulose acetate. In addition, the intermediate structure 120 may be in the form of a tube including a hollow therein, but the disclosure is not limited thereto.

[0039] A length of the intermediate structure 120 is about 7 mm to about 15 mm, and selectively, may be about 7 mm. In addition, the length of the intermediate structure 120 may be variously set, and the entire length of the aerosol-generating material 110 may be changed according to the length of the intermediate structure 120.

[0040] The cooling structure 130 is arranged between the aerosol-generating material 110 and the filter segment 140, and in particular, may be arranged between the intermediate structure 120 and the filter segment 140. For example, the cooling structure 130 may be in contact with the intermediate structure 120 and the filter segment 140.

[0041] The cooling structure 130 may cool the aerosol generated from the aerosol-generating material 110. For example, when the aerosol-generating article 100 is inserted into the aerosol-generating device and used by a user, the aerosol generated from the aerosol-generating material 110 that is heated by the heater may be cooled. Accordingly, the user may inhale the aerosol at a suitable and safe temperature that is not too high.

[0042] A length of the cooling structure 130 may be about 10 mm to about 20 mm, and selectively, 14 mm, but the disclosure is not limited thereto.

[0043] The cooling structure 130 may be formed of various materials, and for example, may contain poly lactic acid (PLA).

[0044] The cooling structure 130 may be manufactured in various ways, for example, may be manufactured, e.g., woven, using fibers containing polylactic acid. In this case, the risk that the cooling structure 130 is deformed or loses functions by an external impact may be lowered. In addition, the cooling structure 130 having various shapes may be manufactured as the method of combining the fibers is changed.

[0045] Also, when the cooling structure 130 is manufactured using fibers, an area of a surface in contact with the aerosol may be increased. Therefore, an aerosol cooling effect by the cooling structure 130 may be further improved.

[0046] The wrapper 150 may be formed to wrap the aerosol-generating material 110, the intermediate structure 130, and the filter segment 140, which are described above. The wrapper 150 may include a plurality of separate wrappers. For example, each of the plurality of separate wrappers may be formed to wrap the aerosol-generating material 110, the intermediate structure 130, and the filter segment 140, which are described above. However, the above described wrapper is only an example, and the embodiment is not limited thereto. The wrapper 150 may be manufactured as a paper wrapper having oil resistance or a general paper-type wrapper.

[0047] FIG. 2 is a diagram illustrating an aerosol-generating article including a heat transfer unit according to some embodiments.

[0048] Referring to FIG. 2, an aerosol-generating article 200 may include a heat transfer unit 210, a medium unit 220, a mouthpiece unit 230, and a wrapper 240. One side of the medium unit 220 may be connected to the heat transfer unit 210, and the other side of the medium unit 220 may be connected to the mouthpiece unit 230.

[0049] The heat transfer unit 210 may receive heat from an external heating device and transfer heat to the medium unit 220. The heat transfer unit 210 may include a binder, and structure particles containing carbon. The structure particles and the binder may form point adhesions, and the binder may adhere to surfaces of the structure particles to support bonding between the structure particles.

[0050] By the point adhesions between the structure particles and the binder, pores may be formed between the structure particles. More pores may be formed between the structure particles by an adhesion in which the binder is in contact with the structure particles in the form of a point than by an adhesion in which the binder is in contact with the structure particles in the form of a line. When the point adhesions between the structure particles and the binder are conducted according to an embodiment, the porosity of the heat transfer unit 210 may be increased. When the porosity is increased, suction resistance of the heat transfer unit 210 may be reduced.

[0051] The medium unit 220 may include solid particles and a heat transfer material. The solid particles may include volatile compounds. The volatile compounds may be released from the solid particles when the volatile compounds are heated, and may generate aerosol. The heat transfer material may be mixed between the solid particles to transfer heat received from the heat transfer unit 210 to the solid particles.

[0052] For example, heat transfer between the solid particles may be performed. The heat transfer material may improve the heat transfer efficiency of the medium unit 220.

[0053] The mouthpiece unit 230 may include a region through which aerosol generated from the mouthpiece unit 220 passes immediately before the aerosol is inhaled by the user. The mouthpiece unit 230 may be formed of various materials. For example, the mouthpiece unit 230 may include cellulose acetate. Also, the mouthpiece unit 230 may be made as a recessed filter including a hollow, but the disclosure is not limited thereto.

[0054] The wrapper 240 may be formed to wrap the heat transfer unit 210, the medium unit 220, and the mouthpiece unit 230, which are described above. The wrapper 240 may include a plurality of separate wrappers. For example, each of the plurality of separate wrappers may be formed to wrap the heat transfer unit 210, the medium unit 220, and the mouthpiece unit 230 described above, respectively. However, the above described wrapper is only an example, and the embodiment is not limited thereto. The wrapper 240 may be manufactured as a paper wrapper having oil resistance or a general paper-type wrapper.

[0055] Referring to FIGS. 1 and 2, the aerosol-generating article 200 shown in FIG. 2 does not include a cooling structure, unlike the aerosol-generating article 100 shown in FIG. 1. The aerosol-generating article 200 shown in FIG. 2 includes a heat transfer unit 210, and in the aerosol-generating article 200, heat is transferred to the medium unit 220 by the heat transfer unit 210 to control temperature, and thus, a separate cooling structure may not be required.

[0056] FIG. 3 is a diagram for illustrating a process in which pores are formed through point adhesions between structure particles containing carbon and a binder according to some embodiments.

[0057] Referring to FIG. 3, an aerosol-generating structure may include structure particles 300 including a carbon component 330 and a binder 310. The carbon component 330 may include a material that is released from the structure particles 300 and forms aerosol when the material is heated.

[0058] For example, the structure particles 300 may be strand-type reconstituted tobacco particles. Alternatively, a plurality of structure particles 300 may include a reconstituted tobacco material, such as a rod, that includes pieces. The reconstituted tobacco material may be formed by processing a tobacco sheet that is manufactured by a method in which a tobacco raw material is pulverized and mixed with a solvent and various additives to be manufactured slurry, and then the slurry is dried to form the tobacco sheet.

[0059] According to some embodiments, by a binder 310 point adhered to the surfaces of the structure particles 300, pores 320 may be formed between the structure particles 300.

[0060] The porosity formed for the binder 310 of the same part by weight may vary according to various types of the structure particles 300. For example, the structure particles 300 of FIG. 3 that are strand type reconstituted tobacco materials may have higher porosity than the solid particles 200 of FIG. 2 that are granular type reconstituted tobacco materials.

[0061] On the basis of 100 parts by weight of the structure particles 300, it may be desirable to form a point adhesion at a ratio in which the binder 310 has about 10 parts by weight to about 35 parts by weight.

[0062] When the part by weight of the binder 310 with respect to 100 parts by weight of the structure particles 300 is 35 parts by weight or more, even if the amount of the binder 310 is increased, adhesion may hardly be improved. Also, when the part by weight of the binder 310 with respect to 100 parts by weight of the structure particles 300 is 35 parts by weight or more, the total volume of aerosol-generating structure may be increased by the binder 310, and the proportion of the pores may be reduced. Accordingly, the suction resistance of the aerosol-generating structure may be increased In addition, because the surfaces of the structure particles 300 is covered with the binder 310, rate of adsorption between the binder 310 and the structure particles 300 may be rapidly reduced.

[0063] On the other hand, when the part by weight of the binder 310 is 10 parts by weight or less with respect to 100 parts by weight of the structure particles 300, the strength of adhesion between the structure particles 300 and the binder 310 decreases, and the structure particles 300 and the binder 310 may not be properly attached.

[0064] The point adhesions between the structure particles 300 and the binder 310 may provide an advantage of forming a high porosity in a small volume. In addition, a porosity of the structure particles 300 may be increased by using a small amount of the binder 310, and a hardness of the structure particles 300 may be improved.

[0065] For example, when a proportion of the binder 310 and the structure particles 300 is maintained at a ratio such that the binder 310 has 10 parts by weight to 35 parts by weight based on 100 parts by weight of the structure particles 300, the suction resistance of the aerosol-generating structure may be 50 mmH_2O/30 mm or less. In addition, by forming the point adhesion between the binder 310 and the solid particles, the hardness of the aerosol-generating structure may be improved by 90 % or more.

[0066] The binder may include at least one of carboxymethyl cellulose, hydroxypropyl methylcellulose, pullulan, and starch.

[0067] In addition, although not shown in the drawings, the pores 320 between the structure particles 300 may include a heat transfer material.

[0068] When the aerosol-generating structure is heated, the heat transfer material may transfer heat to the solid particles, and therefore, the heat transfer efficiency of the aerosol-generating structure may be increased. For example, heat transfer efficiency of the aerosol-generating structure including the heat transfer material may be increased by 2 %, compared to an aerosol-generating structure not including a heat transfer material.

[0069] The heat transfer material may include at least one of activated carbon, carbon nanotubes, graphene, and a polymer substrate having a thermal conductivity of 0.1 W/mK or more. Also, the heat transfer material may include any one of metal materials having the thermal conductivity of 10.0 W/mK or more, such as iron, nickel, aluminum, copper, and stainless steel.

[0070] FIG. 4 is a graph illustrating temperatures according to locations in an aerosol-generating article according to some embodiments.

[0071] Referring to FIG. 4, the position in the aerosol-generating article may include an end portion of the heat transfer unit, one side, which is in contact with the heat transfer unit, of the medium unit, the other side, which is in contact with the mouthpiece unit, of the medium unit, and an end portion of the mouthpiece portion.

[0072] An end portion of a heat transfer unit receiving heat from the external heating device may be heated to about 250 °C to about 350 °C. As heat is transferred from the heat transfer unit to the medium unit, one side, which is in contact with the heat transfer unit, of a medium unit may have a temperature range of about 220 °C to about 320 °C. When the user puffs on the aerosol-generating article, heat is transferred in a direction from the medium unit toward the mouthpiece unit, and the farther from the heat transfer unit and the closer to the mouthpiece unit, the lower the temperature. Accordingly, the other side, which is in contact with the mouthpiece unit, of the medium unit may have a temperature range of about 70 °C to about 100 °C. In addition, in the mouthpiece unit, the closer to an end, the lower the temperature. Accordingly, the end of the mouthpiece unit may have a temperature range of about 40 °C to about 70 °C.

[0073] Because the heat transfer unit includes a carbon component, the heat transfer may be quickly heated to a high temperature by the external heating device. The temperature of heat generated from the heated heat transfer unit may be reduced as the heat is transferred thorough the aerosol-generating article, and when the heat is transferred to mouthpiece unit, the temperature in the mouthpiece unit may be reduced to a temperature suitable for puffing on the mouthpiece unit by the user.

[0074] The aerosol-generating article including the heat transfer unit to which heat is transferred from the external heating device may not require a cooling structure.

[0075] FIG. 5 is a flowchart of a method of manufacturing an aerosol-generating article having a heat transfer unit according to some embodiments. A method of manufacturing an aerosol-generating article may be performed by an apparatus for manufacturing an aerosol-generating article. Those skilled in the art will appreciate that the apparatus for manufacturing an aerosol-generating article may be an apparatus that is generally used in the art to make an aerosol-generating article.

[0076] Referring to FIG. 5, in operation S500, an apparatus for manufacturing an aerosol-generating article may form a heat transfer unit by mixing a binder and structure particles.

[0077] When the apparatus for manufacturing an aerosol-generating article mixes the structure particles and a first binder, pores may be formed between the structure particles as the first binder is point adhered to surfaces of the structure particles. Because the structure included in the heat transfer unit includes a carbon component, the structure particles may be quickly heated to a high temperature in a short time. In addition, by a point adhesion between the first binder and the structure particles, porosity between the structure particles may be increased, and accordingly, the suction resistance of the heat transfer unit may be decreased.

[0078] In operation S510, the apparatus for manufacturing the aerosol-generating article may form a medium unit by mixing a solid particles and a heat transfer material. The medium unit may further include a second binder that adheres to surfaces of the solid particles and supports the solid particles to form pores between the solid particles. Because the second binder supports the solid particles, a relative position between the solid particles or a proportion of pores formed between the solid particles may be maintained.

[0079] In operation S520, the apparatus for manufacturing the aerosol-generating article may connect the heat transfer unit, the medium unit and the mouthpiece unit and wrap the heat transfer unit, the medium unit and the mouthpiece unit with an outer wrapper.

[0080] The apparatus for manufacturing the aerosol-generating article may produce a mouthpiece unit. The mouthpiece unit may include a region through which aerosol generated from the mouthpiece unit passes immediately before the aerosol is inhaled by the user. The mouthpiece unit may be produced by any suitable method that may be selected by one skilled in the art.

[0081] The apparatus for manufacturing the aerosol-generating article may manufacture an aerosol-generating article by connecting one side of the medium unit to heat transfer unit, connecting the other side of the medium unit to the mouthpiece unit, and wrapping the connecting structure with an outer wrapper.

[0082] The aerosol-generating article including the heat transfer unit according to the present disclosure may not include a separate cooling structure. In addition by forming the point adhesions between the binder and particles of the heat transfer unit and the medium unit, the porosity may be increased, and thus the suction resistance of the heat transfer unit may be reduced.

[0083] Those of ordinary skill in the art related to the present embodiments may understand that various changes in form and details may be made therein without departing from the scope of the characteristics described above. The disclosed methods should be considered in a descriptive sense only and not for purposes of limitation. The scope of the present disclosure is disclosed in the appended claims rather than disclosed in the above description, and all differences within the scope of equivalents thereof should be construed as being included in the present disclosure.

Claims

1. An aerosol-generating article comprising:

   a heat transfer unit that includes structure particles and a binder, wherein each of the structure particles contains carbon and the binder adheres to surfaces of the structure particles and supports the structure particles to form pores between the structure particles; and

   a medium unit that includes solid particles and heat transfer material, wherein the solid particles generate an aerosol and the heat transfer material are mixed with the solid particles and transfer heat to the solid particles.

2. The aerosol-generating article of claim 1, wherein the medium unit further includes a binder that adheres to surfaces of the solid particles and supports the solid particles to form pores between the solid particles.

3. The aerosol-generating article of claim 1, wherein the binder includes any one of carboxymethyl cellulose, hydroxypropyl methylcellulose, pullulan, and starch.

4. The aerosol-generating article of claim 1, wherein the structure particles include any one of activated carbon, carbon nanotubes, graphene, a polymer substrate having a thermal conductivity of 0.1 W/mK or more, and a metal material having a thermal conductivity of 10.0 W/mK or more.

5. The aerosol-generating article of claim 1, wherein the heat transfer material includes any one of activated carbon, carbon nanotubes, graphene, a polymer substrate having a thermal conductivity of 0.1 W/mK or more, and a metal material having a thermal conductivity of 10.0 W/mK or more.

6. The aerosol-generating article of claim 1, wherein one side of the medium unit is connected to the heat transfer unit, the aerosol-generating article further comprises a mouthpiece unit connected to the other side of the medium unit,

   and when heat in a temperature range of about 250 °C to about 350 °C is applied to an end portion of the heat transfer unit, a temperature range of a portion where the heat transfer unit and the medium unit contact each other is about 220 °C to about 320 °C, a temperature range of a portion where the medium unit and mouthpiece unit contact each other is about 70 °C to about 100 °C, and a temperature range of an end portion of the mouthpiece unit is about 40 °C to about 70 °C.

7. A method of manufacturing an aerosol-generating article comprising:

   forming a heat transfer unit by mixing a binder and structure particles containing carbon so that the binder adheres to surfaces of the structure particles to form pores between the structure particles;

   forming a medium unit by mixing solid particles that generate aerosol and heat transfer material that transfers heat to the solid particles; and connecting the heat transfer unit to the medium unit and wrapping the heat transfer unit and the medium unit with an outer wrapper.

8. The method of claim 7, wherein the forming of the medium unit includes mixing a binder together with the solid particles and the heat transfer material so that the binder adheres to surfaces of the solid particles and pores are formed between the solid particles.

9. The method of claim 7, a suction resistance of a mixture of the structure particles and the binder is 50 mmH_2O/30 mm or less.

FIG. 1

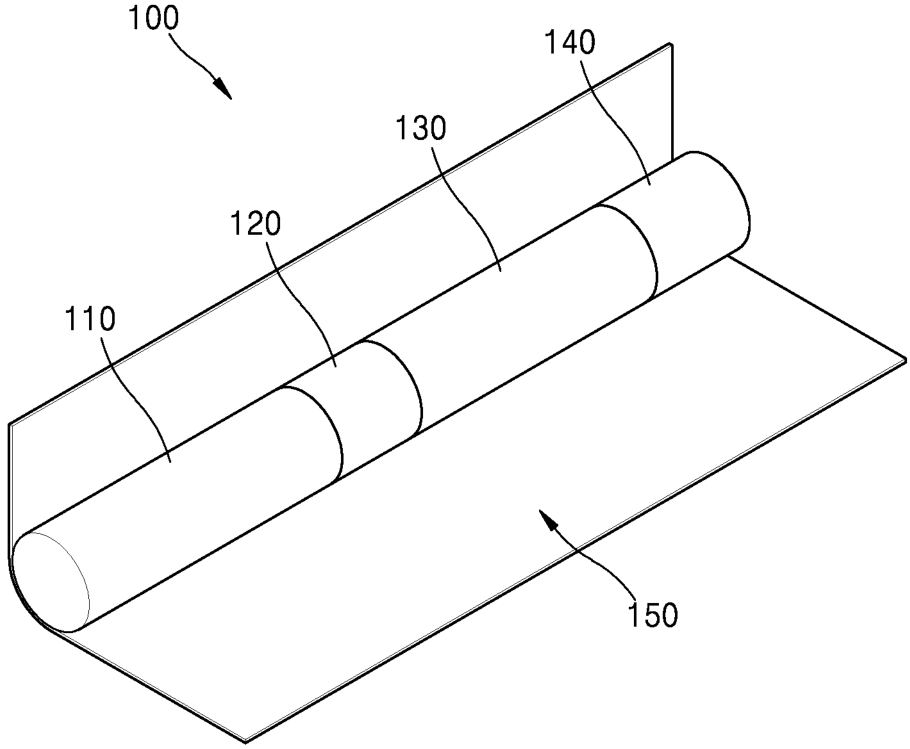


FIG. 2

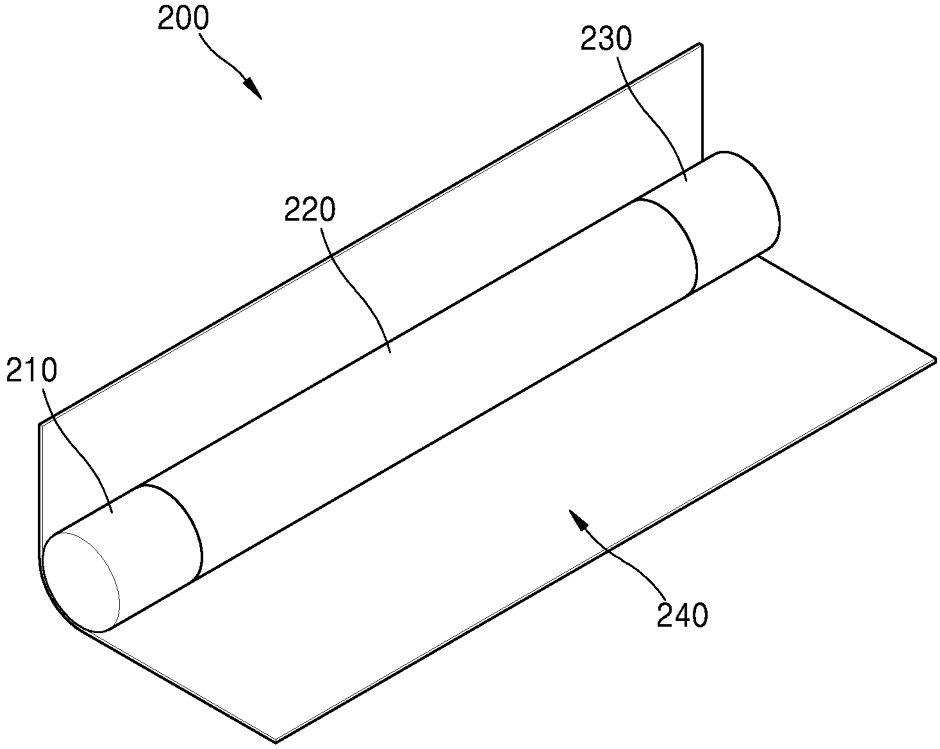


FIG. 3

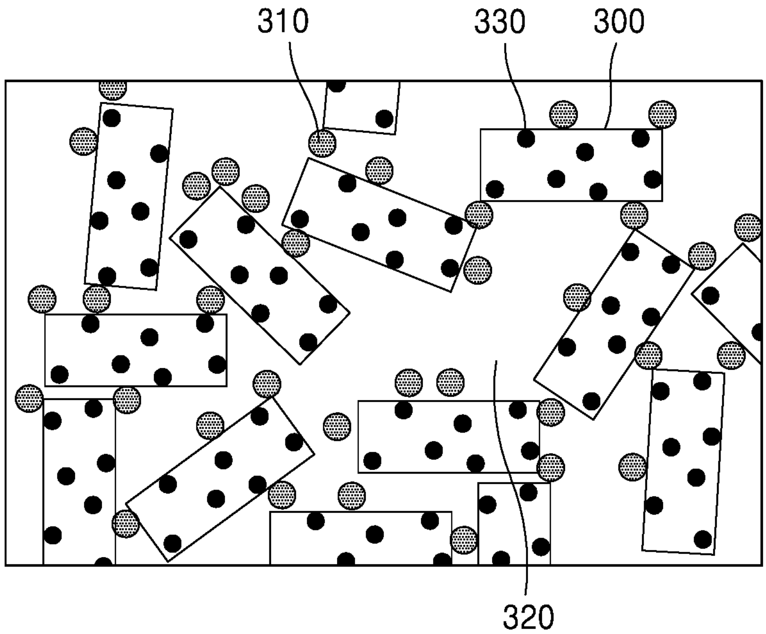


FIG. 4

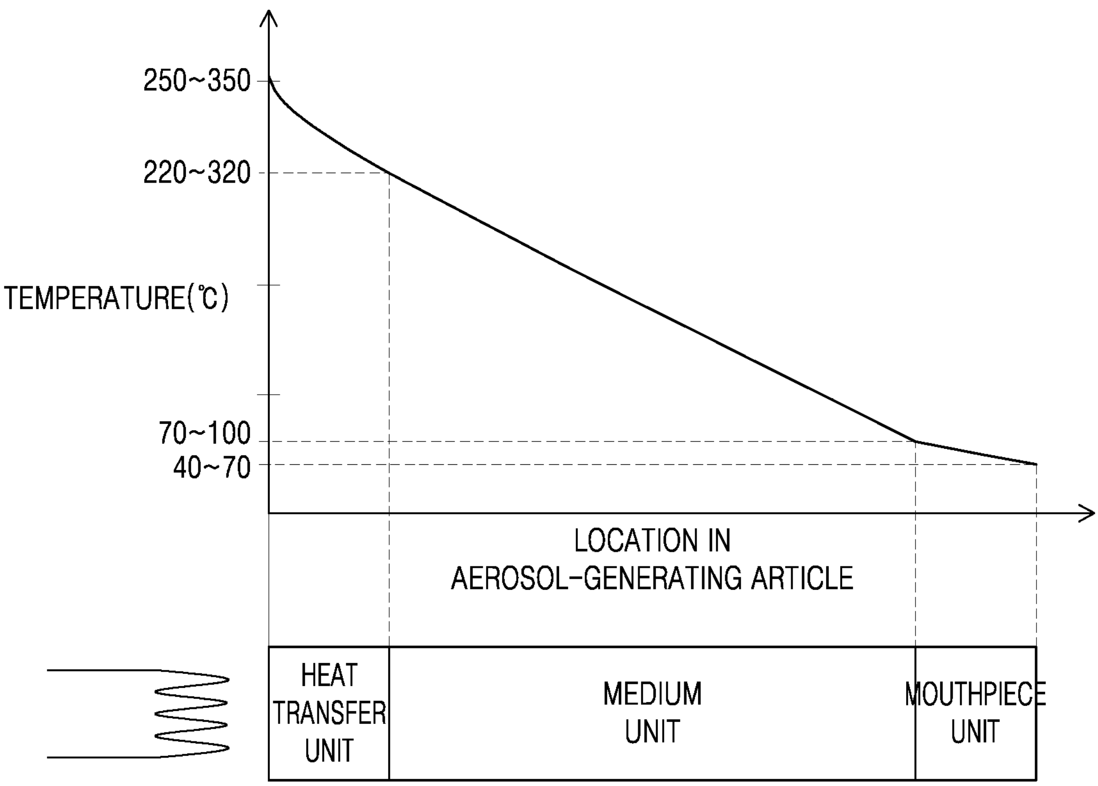
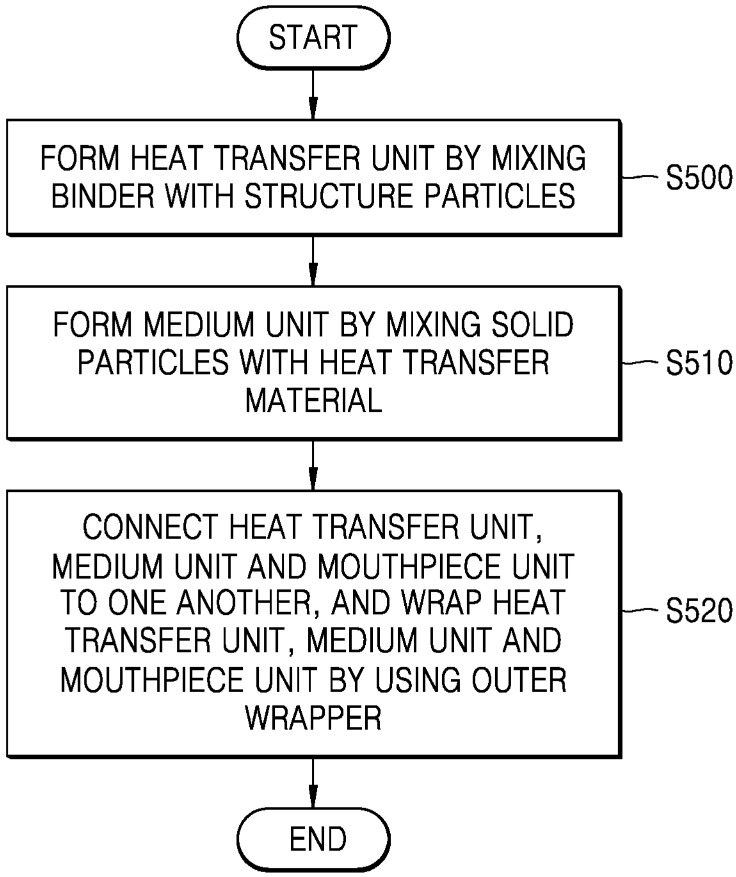

250~350
220~320
TEMPERATURE(℃)
70~100
40~70
LOCATION IN
AEROSOL-GENERATING ARTICLE
HEAT
TRANSFER
UNIT
MEDIUM
UNIT
MOUTHPIECE
UNIT

FIG. 5


START
FORM HEAT TRANSFER UNIT BY MIXING BINDER WITH STRUCTURE PARTICLES
S500
FORM MEDIUM UNIT BY MIXING SOLID PARTICLES WITH HEAT TRANSFER MATERIAL
S510
CONNECT HEAT TRANSFER UNIT, MEDIUM UNIT AND MOUTHPIECE UNIT TO ONE ANOTHER, AND WRAP HEAT TRANSFER UNIT, MEDIUM UNIT AND MOUTHPIECE UNIT BY USING OUTER WRAPPER
S520
END

INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2019/007302

A. CLASSIFICATION OF SUBJECT MATTER

A24D 1/00(2006.01)i, A24B 15/30(2006.01)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)

A24D 1/00; A24B 15/18; A24D 1/04; A24D 3/00; A24D 3/02; A24D 3/06; A24F 1/00; A24F 47/00; A61M 15/06; H05B 6/10; A24B 15/30

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Korean utility models and applications for utility models: IPC as above
Japanese utility models and applications for utility models: IPC as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
eKOMPASS (KIPO internal) & Keywords: aerosol, particle, air gap, binder, heat transfer

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2017-068093 A1 (PHILIP MORRIS PRODUCTS S.A.) 27 April 2017 See page 2, lines 1-5; and claim 1.	1-9
A	KR 10-1655716 B1 (PHILIP MORRIS PRODUCTS S.A.) 07 September 2016 See the entire document.	1-9
A	US 2003-0183237 A1 (XUE, Lixin Luke et al.) 02 October 2003 See the entire document.	1-9
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☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
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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 SEPTEMBER 2019 (24.09.2019)	**25 SEPTEMBER 2019 (25.09.2019)**

Name and mailing address of the ISA/KR
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Facsimile No. +82-42-481-8578

Authorized officer

Telephone No.

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Information on patent family members

International application No.
PCT/KR2019/007302

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