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(54) **AEROSOL GENERATING DEVICE COMPRISING HEATER**

(57) An aerosol generating device includes a heater configured to heat an aerosol generating article, wherein the aerosol generating article includes a plurality of segments separated from each other, and each segment includes a plurality of sections, an airflow path adjuster configured to form an airflow path passing through a segment of the plurality of segments, and a processor configured to operate the heater under a first heating condition using a first temperature profile corresponding to a first section of the plurality of sections of the segment through which the airflow path is formed.

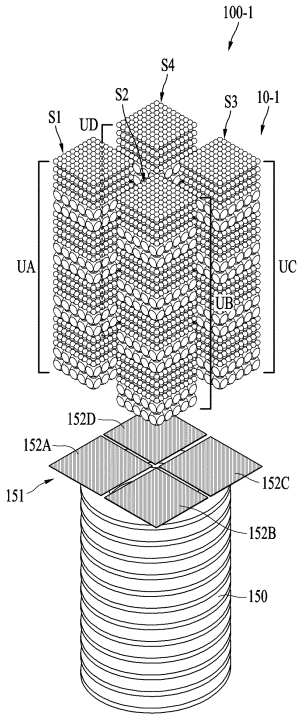

FIG. 6

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Description

Technical Field

[0001] The disclosure relates to an aerosol generating device, and more particularly, to an aerosol generating device including a heater.

Background Art

[0002] An aerosol generating article containing leaf tobacco to which flavoring materials are added has been developed. When the aerosol generating article is burned or heated, a nicotine-containing aerosol may be transferred to a user. The above description is information the inventor(s) acquired during the course of conceiving the present disclosure, or already possessed at the time, and is not necessarily art publicly known before the present application was filed.

Disclosure of the Invention

Technical Problem

[0003] An aspect of the disclosure may provide an aerosol generating device including a heater configured to operate under a heating condition that varies based on a temperature profile corresponding to a section (e.g., a unit medium) in an aerosol generating article.

Solution to Problem

[0004] An aerosol generating device may include a heater configured to heat an aerosol generating article, wherein the aerosol generating article includes a plurality of segments separated from each other, and each segment includes a plurality of sections, an airflow path adjuster configured to form an airflow path passing through a segment of the plurality of segments, and a processor configured to operate the heater under a first heating condition using a first temperature profile corresponding to a first section of the plurality of sections of the segment through which the airflow path is formed.

[0005] The processor may be configured to change the first heating condition of the heater to a second heating condition using a second temperature profile corresponding to a second section of a plurality of sections of the segment through which the airflow path is formed.

[0006] The airflow path adjuster may include a plurality of flexible membranes respectively corresponding to the plurality of segments, wherein opening degrees of the plurality of flexible membranes are configured to be adjusted.

[0007] When a membrane of the plurality of flexible membranes is at least partially opened, at least one remaining membrane may be configured to be closed.

[0008] A plurality of airflow paths respectively passing through the plurality of segments may be disposed in parallel.

[0009] The processor may be configured to receive an updated temperature profile from an external device.

[0010] The processor may be configured to receive the temperature profile from the external device in a form of firmware code.

[0011] The processor may be configured to receive the temperature profile from the external device via wireless communication.

[0012] The first section may include a unit medium of a plurality of unit mediums defining the segment, wherein the unit medium includes a plurality of components and a pore defined between the plurality of components.

[0013] The heater may include a convection heater configured to heat the aerosol generating article by convection.

[0014] An aerosol generating device may include a heater configured to heat an aerosol generating article, wherein the aerosol generating article includes a segment, and the segment includes a plurality of sections, and a processor configured to operate the heater using a first temperature profile corresponding to a first section of the plurality of sections.

[0015] The processor may be configured to change a first heating condition of the heater to a second heating condition using a second temperature profile corresponding to a second section of the plurality of sections.

[0016] The processor may be configured to receive an updated temperature profile from an external device.

[0017] The processor may be configured to receive the temperature profile from the external device in a form of firmware code.

[0018] The processor may be configured to receive the temperature profile from the external device via wireless communication.

Advantageous Effects of Invention

[0019] According to an embodiment, only a heated portion among portions of an aerosol generating article may form an airflow path. According to an embodiment, a user may be provided with an aerosol containing various components with just one installation of an aerosol generating article. According to an embodiment, various mediums may be heated individually. According to an embodiment, airflow may be controlled in a contactless manner. The effects of an aerosol generating device including a heater according to an embodiment may not be limited to the above-mentioned effects, and other unmentioned effects may be clearly understood from the following description by one of ordinary skill in the art.

Brief Description of Drawings

[0020] The foregoing and other aspects, features, and advantages of embodiments in the disclosure will become apparent from the following detailed description referring to the accompanying drawings.

FIG. 1 is a perspective view of an aerosol generating article according to an embodiment.
FIG. 2 is a perspective view of a unit medium according to an embodiment.
FIG. 3 is a perspective view of a portion of a layer according to an embodiment.
FIG. 4 is a perspective view of an aerosol generating article according to an embodiment.
FIG. 5 is a diagram schematically illustrating an aerosol generating device according to an embodiment.
FIG. 6 is a diagram illustrating an aerosol generating device according to an embodiment.
FIG. 7 is a diagram illustrating an aerosol generating device in which a first membrane is opened, according to an embodiment.
FIG. 8 is a diagram illustrating an aerosol generating device in which a second membrane is opened, according to an embodiment.
FIG. 9 is a diagram illustrating an aerosol generating device in which a third membrane is opened, according to an embodiment.
FIG. 10 is a diagram illustrating an aerosol generating device in which a fourth membrane is opened, according to an embodiment.
FIG. 11 is a diagram illustrating an aerosol generating device in which a first airflow path is formed, according to an embodiment.
FIG. 12 is a diagram illustrating an aerosol generating device in which a second airflow path is formed, according to an embodiment.
FIG. 13 is a diagram illustrating an aerosol generating device in which a third airflow path is formed, according to an embodiment.
FIG. 14 is a diagram illustrating an aerosol generating device in which a first airflow path is formed, according to an embodiment.
FIG. 15 is a diagram illustrating an aerosol generating device in which a second airflow path is formed, according to an embodiment.
FIG. 16 is a diagram illustrating an aerosol generating device in which a third airflow path is formed, according to an embodiment.
FIG. 17 is a diagram illustrating an aerosol generating device receiving a temperature profile from an external device, according to an embodiment.
FIG. 18 is a diagram illustrating an aerosol generating device changing a heating condition of a heater using a temperature profile corresponding to a section of a single segment of an aerosol generating article according to an embodiment.
FIG. 19 is a diagram illustrating an aerosol generating device changing a heating condition of a heater using a temperature profile corresponding to a section of a segment of a plurality of segments of an aerosol generating article according to an embodiment.

Mode for the Invention

[0021] Hereinafter, embodiments will be described in detail with reference to the accompanying drawings. However, various alterations and modifications may be made to the example embodiments. Here, the embodiments are not construed as limited to the disclosure. The embodiments should be understood to include all changes, equivalents, and replacements within the idea and the technical scope of the disclosure.

[0022] The terminology used herein is for the purpose of describing particular embodiments only and is not to be limiting of the embodiments. The singular forms "a", "an", and "the" are intended to include the plural forms as well, unless the context clearly indicates otherwise. It will be further understood that the terms "comprises/comprising" or "includes/including" when used herein, specify the presence of stated features, integers, steps, operations, elements, components, or groups thereof, but do not preclude the presence or addition of one or more other features, integers, steps, operations, elements, components, or groups thereof.

[0023] Unless otherwise defined, all terms including technical and scientific terms used herein have the same meaning as commonly understood by one of ordinary skill in the art to which embodiments belong. It will be further understood that terms, such as those defined in commonly-used dictionaries, should be interpreted as having a meaning that is consistent with their meaning in the context of the relevant art and will not be interpreted in an idealized or overly formal sense unless expressly so defined herein.

[0024] When describing the embodiments with reference to the accompanying drawings, like reference numerals refer to like constituent elements and a repeated description related thereto will be omitted. In the description of embodiments, detailed description of well-known related structures or functions will be omitted when it is deemed that such description will cause ambiguous interpretation of the present disclosure.

[0025] Also, in the description of the components, terms such as first, second, A, B, (a), (b) or the like may be used herein when describing components of the present disclosure. These terms are used only for the purpose of discriminating one constituent element from another constituent element, and the nature, the sequences, or the orders of the constituent elements are not limited by the terms. When one component is described as being "connected", "coupled", or "attached" to another component, it should be understood that one component may be connected or attached directly to another component, and an intervening component may also be "connected", "coupled", or "attached" to the components.

[0026] The same name may be used to describe an element included in the embodiments described above and an element having a common function. Unless stated otherwise, the description of an embodiment may be ap-

plicable to other embodiments, and a repeated description related thereto is omitted.

[0027] FIG. 1 is a perspective view of an aerosol generating article according to an embodiment.

[0028] Referring to FIG. 1, an aerosol generating article 10 may be configured to generate an aerosol. For example, the aerosol generating article 10 may transition from a solid phase to a gas phase or from a liquid phase to a gas phase in a predetermined environment (e.g., an environment with a temperature of about 200°C).

[0029] The aerosol generating article 10 may include a solid with a substantially polygonal cross-section. For example, a transverse section of the aerosol generating article 10, viewed in a direction parallel to an XY plane, may have a quadrangular shape. In an embodiment not shown, the aerosol generating article 10 may include a solid with a substantially circular or oval cross-section.

[0030] The aerosol generating article 10 may have a first width or a first diameter (e.g., a dimension in an X-axis direction), a second width or a second diameter (e.g., a dimension in a Y-axis direction), and a length (e.g., a dimension in a Z-axis direction). The first width or the first diameter of the aerosol generating article 10 may be substantially the same as the second width or the second diameter of the aerosol generating article 10. The length of the aerosol generating article 10 may be greater than the first width or the first diameter of the aerosol generating article 10. The length of the aerosol generating article 10 may be greater than the second width or the second diameter of the aerosol generating article 10. For example, the first width or the first diameter of the aerosol generating article 10 may be about 0.6 centimeters (cm). The length of the aerosol generating article 10 may be about 5 cm.

[0031] In an embodiment not shown, the first width or the first diameter of the aerosol generating article 10 may be different from the second width or the second diameter of the aerosol generating article 10. The length of the aerosol generating article 10 may be substantially the same as or less than the first width or the first diameter of the aerosol generating article 10. The length of the aerosol generating article 10 may be substantially the same as or less than the second width or the second diameter of the aerosol generating article 10.

[0032] The aerosol generating article 10 may include a plurality of unit mediums (e.g., U1, U2, U3, U4, U5, U6, U7, U8, U9, and U10). Here, the unit mediums (e.g., U1 to U10) may be minimum unit articles (e.g., pieces) that a user inhales from the aerosol generating article 10. Meanwhile, although the number of unit mediums (e.g., U1 to U10) illustrated in FIG. 1 is 10, embodiments are not limited thereto, and it may be possible to implement the aerosol generating article 10 including various numbers of unit mediums.

[0033] The plurality of unit mediums (e.g., U1 to U10) may define a segment S1. In an example, the segment S1 may be a packaged article in which the plurality of unit mediums (e.g., U1 to U10) is packed. In an example, the segment S1 may be a unit article provided to an aerosol generating device (not shown).

[0034] The plurality of unit mediums (e.g., U1 to U10) may include a substantially identical shape. For example, the plurality of unit mediums (e.g., U1 to U10) may include a substantially hexahedral shape. However, the shapes of the plurality of unit mediums (e.g., U1 to U10) are not limited thereto and may also be implemented in various other shapes (e.g., a cylinder). In an embodiment not shown, a shape of at least one of the plurality of unit mediums (e.g., U1 to U10) may be different from a shape of at least one other unit medium. For example, the shapes of a first unit medium U1 to a fifth unit medium U5 may be implemented as hexahedrons, while the shapes of a sixth unit medium U6 to a tenth unit medium U10 may be implemented as cylinders.

[0035] Each of the plurality of unit mediums (e.g., U1 to U10) may include components with varying composition ratios. In an example, components of a unit medium (e.g., the first unit medium U1) may be at least partially different from components of another unit medium (e.g., a second unit medium U2). In an example, components of a unit medium (e.g., the second unit medium U2) may be the same as components of another unit medium (e.g., a third unit medium U3). In an example, a composition ratio of components of a unit medium (e.g., the second unit medium U2) may be different from a composition ratio of components of another unit medium (e.g., the third unit medium U3). In an example, the composition ratio of components of a unit medium (e.g., the third unit medium U3) may be the same as the composition ratio of components of another unit medium (e.g., a fourth unit medium U4).

[0036] The plurality of unit mediums (e.g., U1 to U10) may be implemented in shapes with various dimensions. The width or diameter (e.g., the dimension in the X-axis direction and/or the dimension in the Y-axis direction) of a unit medium (e.g., the first unit medium U1) may be different from the width or diameter (e.g., the dimension in the X-axis direction and/or the dimension in the Y-axis direction) of another unit medium (e.g., the second unit medium U2). The width or diameter (e.g., the dimension in the X-axis direction and/or the dimension in the Y-axis direction) of a unit medium (e.g., the second unit medium U2) may be the same as the width or diameter (e.g., the dimension in the X-axis direction and/or the dimension in the Y-axis direction) of another unit medium (e.g., the third unit medium U3). The length (e.g., the dimension in the Z-axis direction) of a unit medium (e.g., the second unit medium U2) may be different from the length (the dimension in the Z-axis direction) of another unit medium (e.g., the third unit medium U3). The length (e.g., the dimension in the Z-axis direction) of a unit medium (e.g., the first unit medium U1) may be the same as the length (e.g., the dimension in the Z-axis direction) of another unit medium (e.g., the second unit medium U2).

[0037] The plurality of unit mediums (e.g., U1 to U10) may be stacked. A unit medium (e.g., the second unit

medium U2) may be disposed on another unit medium (e.g., the first unit medium U1). A unit medium and an adjacent unit medium may directly abut each other. The stacking direction of the plurality of unit mediums (e.g., U1 to U10) may be substantially the same as the longitudinal direction of the aerosol generating article 10.

[0038] The aerosol generating article 10 may not include a filter. The aerosol generating article 10 without a filter may include a larger number of unit mediums (e.g., U1 to U10).

[0039] In an embodiment not shown, the aerosol generating article 10 may include a single unit medium. The single unit medium may define the segment S1.

[0040] FIG. 2 is a perspective view of a unit medium according to an embodiment.

[0041] Referring to FIG. 2, a unit medium UM (e.g., the unit mediums U1 to U10 of FIG. 1) may include a substantially hexahedral shape. The unit medium UM may have a first dimension (e.g., a dimension in an X-axis direction), a second dimension (e.g., a dimension in a Y-axis direction), and a third dimension (e.g., a dimension in a Z-axis direction). The first dimension, the second dimension, and the third dimension may be substantially the same. At least two of the first dimension, the second dimension, and the third dimension may be different from each other. In an embodiment not shown, unit mediums (e.g., UM) may include a solid (e.g., a cylinder) with a substantially circular or oval cross-section. The diameters and lengths of the unit mediums (e.g., UM) may be substantially the same. The diameters and lengths of the unit mediums (e.g., UM) may be different. In an embodiment not shown, a unit medium (e.g., UM) may include a torus shape.

[0042] The unit medium (e.g., UM) may include a plurality of layers (e.g., L1 and L2). For example, the unit medium (e.g., UM) may include a first layer L1 and a second layer L2. However, the number of layers that defines the unit medium (e.g., UM) is not limited thereto, and the unit medium may also be implemented with various numbers of layers. In an example, the unit medium (e.g., UM) may include a single layer. In an example, the unit medium (e.g., UM) may include three or more layers.

[0043] The plurality of layers (e.g., L1 and L2) may be stacked. A layer (e.g., the second layer L2) may be disposed on another layer (e.g., the first layer L1). A layer and an adjacent layer may directly abut each other. The stacking direction of the plurality of layers (e.g., L1 and L2) may be substantially the same as a dimension in a direction (e.g., the dimension in the Z-axis direction) of the unit medium (e.g., UM).

[0044] The plurality of layers (e.g., L1 and L2) may include different components. For example, the first layer L1 may include at least one component (e.g., C11, C12, and C13) associated with aerosol formation and the second layer L2 may include at least one component (e.g., C21 and C22) configured to be carried or bound with a formed aerosol.

[0045] The first layer L1 may include an aerosol former C11. The aerosol former C11 may be referred to as a moisturizing agent. For example, the aerosol former C11 may include at least one of propylene glycol or glycerin or a combination thereof.

[0046] The first layer L1 may include about 100% by weight or less, about 99.5% by weight or less, about 99% by weight or less, or about 95% by weight or less of the aerosol former C11. The first layer L1 may include more than about 0% by weight, about 69.5% by weight or more, or about 70% by weight or more of the aerosol former C11. The first layer L1 may include a flavoring agent C12. For example, the flavoring agent C12 may include at least one of menthol, peppermint, spearmint oil, or a fruit-flavored component or a combination thereof. The first layer L1 may include about 1% by weight or less, about 0.5% by weight or less, or about 0.3% by weight or less of the flavoring agent C12. In some embodiments, the first layer L1 may substantially not include the flavoring agent C12.

[0047] The first layer L1 may include a binder C13. The binder C13 may be referred to as resin. The binder C13 may allow a combination of at least two components (e.g., a combination of at least two aerosol formers (e.g., C11), a combination of at least two flavoring agents (e.g., C12), or a combination of at least one aerosol former C11 and at least one flavoring agent C12). The first layer L1 may include about 30% by weight or less, about 25% by weight or less, about 20% by weight or less, about 15% by weight or less, about 10% by weight or less, about 5% by weight or less, about 3% by weight or less, about 2% by weight or less, or about 1% by weight or less of the binder C13. In some embodiments, the first layer L1 may substantially not include the binder C13.

[0048] At least one component (e.g., the aerosol former C11 and/or the flavoring agent C12) included in the first layer L1 may be in granular or powder form.

[0049] The second layer L2 may include an aerosol substrate C21. The aerosol substrate C21 may include at least one of tobacco or a vitamin or a combination thereof. The tobacco may include at least one of a leaf form or a stem form or a combination thereof. The tobacco may include at least one of flue-cured tobacco, burley tobacco, orient tobacco, or other special leaf tobacco or a combination thereof. The vitamin may include at least one of vitamin A, vitamin B, vitamin C, or vitamin E or a combination thereof. The second layer L2 may include about 50% by weight or less, about 30% by weight or less, about 20% by weight or less, or about 15% by weight or less of the aerosol substrate C21. For example, the second layer L2 may include at least one of about 50% by weight or less of flue-cured tobacco, about 30% by weight or less of burley tobacco, about 15% by weight or less of orient tobacco, or about 15% by weight or less of special leaf tobacco or a combination thereof. The second layer L2 may include about 5% by weight or more, about 20% by weight or more, or about 30% by weight or more of the aerosol substrate C21. For example, the second layer L2 may include at least one of about 30% by weight or more of flue-cured tobacco, about 20% by

weight or more of burley tobacco, about 5% by weight or more of orient tobacco, or more than 0% of special leaf tobacco or a combination thereof. In some embodiments, the second layer L2 may not include special leaf tobacco.

[0050] The second layer L2 may include a binder C22. The binder C22 may allow a combination of at least two aerosol substrates (e.g., C21). The second layer L2 may include about 30% by weight or less, about 25% by weight or less, about 20% by weight or less, about 15% by weight or less, about 10% by weight or less, about 5% by weight or less, about 3% by weight or less, about 2% by weight or less, or about 1% by weight or less of the binder C22. In some embodiments, the second layer L2 may substantially not include the binder C22.

[0051] In an embodiment not shown, the second layer L2 may include a flavoring agent.

[0052] At least one component (e.g., the aerosol substrate C21) included in the second layer L2 may be in granular or powder form.

[0053] The first layer L1 may have a first thickness. For example, the first thickness may be about 0.2 cm. The second layer L2 may have a second thickness that is greater than the first thickness of the first layer L1. For example, the second thickness may be about 0.3 cm. In an embodiment not shown, the first thickness may be substantially the same as or greater than the second thickness.

[0054] FIG. 3 is a perspective view of a portion of a layer according to an embodiment.

[0055] Referring to FIG. 3, a layer L (e.g., the first layer L1 and/or the second layer L2 of FIG. 2) may include a plurality of components C (e.g., at least one of the aerosol former C11, the flavoring agent C12, the binder C13, the aerosol substrate C21, or the binder C22 of FIG. 2 or a combination thereof).

[0056] The layer L may include a pore G defined between the plurality of components C. The pore G may impart porosity to the layer L. The pore G may enable a uniform expression of a component (e.g., at least one of the aerosol former C11 or the flavoring agent C12 or a combination thereof) from the layer L. The pore G may increase an expression level of the component. The pore G may increase a surface area of the component in a predetermined environment (e.g., an environment with a temperature of about 200°C). The pore G may increase the efficiency of heat energy transfer to the component.

[0057] The pore G may be a void space. Air entering the layer L may be in contact with the component and escape from the layer L through the pore G. In an embodiment not shown, the layer L may include an interstitial material partially filled in the pore G.

[0058] FIG. 4 is a perspective view of an aerosol generating article according to an embodiment.

[0059] Referring to FIG. 4, an aerosol generating article 10-1 (e.g., the aerosol generating article 10 of FIG. 1) may include a plurality of segments (e.g., S1 and S2). For example, the aerosol generating article 10-1 may include a first segment S1 and a second segment S2. The first segment S1 may include a stack of a plurality of first unit mediums UA. The second segment S2 may include a stack of a plurality of second unit mediums UB.

[0060] The plurality of segments (e.g., S1 and S2) may be disposed in the aerosol generating article 10-1. For example, a user may inhale aerosols with various flavors by filling an aerosol generating device (e.g., an aerosol generating device 100 of FIG. 5) with the aerosol generating article 10-1 only once.

[0061] The plurality of segments (e.g., S1 and S2) may be disposed substantially side-by-side (e.g., juxtapositioned) in the aerosol generating article 10-1. For example, the stacking direction of the plurality of first unit mediums UA included in the first segment S1 may be substantially parallel to the stacking direction of the plurality of second unit mediums UB included in the second segment S2.

[0062] FIG. 5 is a diagram schematically illustrating an aerosol generating device according to an embodiment.

[0063] Referring to FIG. 5, the aerosol generating device 100 may include a housing 110. The housing 110 may include a mouth end portion 110A, a device end portion 110B opposite to the mouth end portion 110A, and an extension 110C extending between the mouth end portion 110A and the device end portion 110B. For example, the housing 110 may include a solid (e.g., a cylinder) with a substantially circular or oval cross-section but is not limited thereto and may be implemented with a solid with a cross-section in various shapes.

[0064] The housing 110 may include a first portion 111A and a second portion 111B. The first portion 111A may be defined as a first side (e.g., the left side in FIG. 5) of the extension 110C. The second portion 111B may be defined as a second side (e.g., the right side in FIG. 5) opposite to the first side of the extension 110C.

[0065] The housing 110 may include a plurality of inner spaces. The housing 110 may include a first partition 111C. The first partition 111C may be disposed between the first portion 111A and the second portion 111B of the housing 110. The first partition 111C may extend between the mouth end portion 110A and the device end portion 110B. The first partition 111C may include at least a partially open region. The housing 110 may include a second partition 111D. The second partition 111D may include at least a partially open region. The second partition 111D may connect an inner surface of the extension 110C to one side (e.g., the left side in FIG. 5) of the first partition 111C. The second partition 111D may extend in a direction intersecting with (e.g., substantially orthogonal to) the extending direction of the first partition 111C. The housing 110 may include a third partition 111E. The third partition 111E may connect the inner surface of the extension 110C to the other side (e.g., the right side in FIG. 5) of the first partition 111C. The third partition 111E may extend in a direction intersecting with (e.g., substantially orthogonal to) the extending direction of the first partition 111C. The extending direction of the third partition 111E may be substantially parallel to the extending

direction of the second partition 111D. The third partition 111E may have a substantially enclosed region. At least one of the first partition 111C, the second partition 11 ID, and the third partition 111E may act as a heat transfer barrier with a relatively low heat transfer coefficient.

[0066] The housing 110 may include an accommodation chamber 112. The accommodation chamber 112 may be configured to accommodate the aerosol generating article 10. The accommodation chamber 112 may be at least partially defined on one side (e.g., the right side in FIG. 5) of the housing 110. The accommodation chamber 112 may have a volume defined by a portion of the mouth end portion 110A, a portion of the first partition 111C, a partial region of the inner surface of the extension 110C, and a portion of the third partition 111D. The accommodation chamber 112 may have a predetermined length suitable for accommodating a stack of a plurality of unit mediums (e.g., UM) that defines a segment S.

[0067] The housing 110 may include an inlet 113. The inlet 113 may allow the aerosol generating article 10 to pass through the inlet 113 and be accommodated in the accommodation chamber 112. The inlet 113 may include a substantially circular or oval shape but is not limited thereto and may include a shape complementary to the shape of the aerosol generating article 10. The inlet 113 may be disposed in a region (e.g., the right region in FIG. 5) of the mouth end portion 110A in the second portion 111B of the housing 110. In an embodiment not shown, the inlet 113 may be configured to be opened and closed by a predetermined suitable mechanism (e.g., a hinged cover or door).

[0068] The housing 110 may include a heating chamber 114. The heating chamber 114 may be configured to accommodate at least a portion (e.g., a predetermined unit medium (e.g., UM'), desirably a topmost unit medium (e.g., UM'), of the plurality of unit mediums (e.g., UM) defining the segment S) of the aerosol generating article 10. A portion (e.g., a unit medium (e.g., UM')) of the aerosol generating article 10 accommodated in the heating chamber 114 may be heated. The heating chamber 114 may be at least partially defined on one side (e.g., the left side in FIG. 5) of the housing 110. The heating chamber 114 may include a volume defined by the mouth end portion 110A, the portion of the first partition 111C, the portion of the second partition 111D, and the partial region of the inner surface of the extension 110C. A dimension (e.g., length) or volume of the heating chamber 114 may be the same as or less than a corresponding dimension (e.g., length) or volume of the accommodation chamber 112.

[0069] The housing 110 may include an intermediate opening 115. The intermediate opening 115 may allow at least a portion (e.g., the unit medium (e.g., UM')) of the aerosol generating article 10 accommodated in the accommodation chamber 112 to pass through the intermediate opening 115 and be accommodated in the heating chamber 114. The intermediate opening 115 may include a substantially circular or oval shape but is not limited thereto and may include a shape (e.g., a hexahedral shape) complementary to the shape of the portion (e.g., the unit medium (e.g., UM')) of the aerosol generating article 10. The intermediate opening 115 may be disposed in the first partition 111C. In an embodiment not shown, the intermediate opening 115 may be configured to be opened and closed by a predetermined suitable mechanism (e.g., a hinged cover or door).

[0070] The housing 110 may include an outlet 116. The outlet 116 may allow at least a portion (e.g., the unit medium (e.g., UM')) of the aerosol generating article 10 accommodated in the heating chamber 114 to pass through the outlet 116 and escape to the outside of the housing 110. The outlet 116 may include a substantially circular or oval shape but is not limited thereto and may include a shape (e.g., a hexahedral shape) complementary to the shape of the portion (e.g., the unit medium (e.g., UM')) of the aerosol generating article 10. The outlet 116 may be disposed on a side surface of the extension 110C in the first portion 111A of the housing 110. In an embodiment not shown, the outlet 116 may be configured to be opened and closed by a predetermined suitable mechanism (e.g., a hinged cover or door).

[0071] The housing 110 may include one or more vents 117. The vents 117 may be configured to discharge at least one gaseous material (e.g., air) in the housing 110 to the outside of the housing 110 or allow an external gaseous material to flow into the housing 110. For example, the housing 110 may include four vents 117 arranged in a row along the side surface of the extension 110C.

[0072] The housing 110 may include guides (e.g., 118A and 118B). The guides (e.g., 118A and 118B) may be configured to guide the movement of at least one unit medium (e.g., UM) of the aerosol generating article 10 disposed in the accommodation chamber 112. For example, the guides (e.g., 118A and 118B) may be implemented as sidewalls. The guides (e.g., 118A and 118B) may allow at least one unit medium (e.g., UM) to be arranged in place in a predetermined situation (e.g., when at least one unit medium (e.g., UM) is inclined). In an embodiment, the housing 110 may include a first guide 118A. The first guide 118A may be disposed on or adjacent to (e.g., spaced at a distance from) the inner surface of the extension 110C on one side (e.g., the right side in FIG. 5) of the housing 110. The first guide 118A may extend between the mouth end portion 110A and the third partition 111E. In an embodiment, the housing 110 may include a second guide 118B. The second guide 118B may be disposed on or adjacent to (e.g., spaced at a distance from) an inner surface of the first partition 111C on one side (e.g., the medial side in FIG. 5) of the housing 110. The second guide 118B may extend from the third partition 111E to the mouth end portion 110A along the first partition 111C. The second guide 118B may not substantially cover the intermediate opening 115.

[0073] The aerosol generating device 100 may include a mouthpiece 120. The mouthpiece 120 may have a pre-

determined shape suitable for transferring an aerosol to the oral cavity and/or the nasal cavity of a user. For example, the mouthpiece 120 may include a tapered shape having a width decreasing from the mouth end portion 110A. The mouthpiece 120 may be disposed in one region (e.g., the left region in FIG. 5) of the mouth end portion 110A in the first portion 111A of the housing 110.

[0074] In an embodiment not shown, the aerosol generating device 100 may include a sensor. In an example, the aerosol generating device 100 may include a temperature sensor configured to sense the temperature in the heating chamber 114. In an example, the aerosol generating device 100 may include a puff sensor configured to sense a puff motion of the user through the mouthpiece 120. In an example, the aerosol generating device 100 may include a pressure sensor configured to sense the pressure in the heating chamber 114. In an example, the aerosol generating device 100 may include a humidity sensor, a barometric pressure sensor, a magnetic sensor, an accelerometer sensor, a gyro sensor, a global positioning system (GPS) sensor, a proximity sensor, an optical sensor, or other predetermined suitable sensors, or a combination thereof. The sensor may be included in the mouthpiece 120, but embodiments are not limited thereto, and the sensor may be disposed in a predetermined location suitable for operation in the housing 110, considering an operating environment of the sensor.

[0075] The aerosol generating device 100 may include a lifting structure 130. The lifting structure 130 may be configured to lift at least one portion (e.g., at least one of a plurality of unit mediums (e.g., UM) defining the segment S) of the aerosol generating article 10. For example, the lifting structure 130 may be configured to lift a stack of the unit mediums (e.g., UM) accommodated in an accommodation region 112A of the accommodation chamber 112 closer to the device end portion 110B than the mouth end portion 110A to a separation region 112B of the accommodation chamber 112 closer to the mouth end portion 110A than the device end portion 110B.

[0076] In an embodiment, the lifting structure 130 may include a support body 131 configured to support the aerosol generating article 10 and an elastic body 132 configured to elastically support the support body 131. For example, the support body 131 may be implemented as a plate having a cross-section in various shapes (e.g., a circular, oval, or polygonal cross-section), but embodiments are not limited thereto, and the support body 131 may have various structures that may support the aerosol generating article 10. The support body 131 may be in contact with a lowermost unit medium (e.g., UM) of the plurality of unit mediums (e.g., UM) defining the segment S. The elastic body 132 may include a compression spring. One end of the elastic body 132 may be placed on the third partition 111E. The other end of the elastic body 132 may be connected to the support body 131.

[0077] The aerosol generating device 100 may include a divider 140. The divider 140 may be configured to separate at least a portion (e.g., a unit medium (e.g., UM)) of the aerosol generating article 10 accommodated in the accommodation chamber 112. The divider 140 may be configured to transfer the separated portion to the heating chamber 114. The divider 140 may be disposed in the first guide 118A and/or on the inner surface of the extension 110C. In an embodiment not shown, the divider 140 may include a blade (not shown) configured to partially cut the aerosol generating article 10 and a pusher (not shown) configured to push the cut portion into the heating chamber 114.

[0078] The aerosol generating device 100 may include a heater 150. The heater 150 may be configured to generate heat. The heater 150 may be disposed in a space defined by the device end portion 110B, the portion of the first partition 111C, the partial region of the inner surface of the extension 110C, and the second partition 111D. The heater 150 may be disposed in a space separated from the heating chamber 114. The space in which the heater 150 is disposed may be in fluid communication with the one or more vents 117.

[0079] In an embodiment, the heater 150 may include an electrically resistive heater. For example, the heater 150 may include an electrically conductive track.

[0080] In an embodiment, the heater 150 may include an induction heater. For example, the heater 150 may include an electrically conductive coil. In an example, each unit medium (e.g., UM and UM') of the aerosol generating article 10 may include a susceptor. In an example, the susceptor may be disposed in the heating chamber 114.

[0081] In an embodiment, the heater 150 may include a convection heater. The convection heater may not be in contact with a unit medium (e.g., UM') accommodated in the heating chamber 114. The convection heater may be configured to heat air and allow the heated air to flow in the heating chamber 114 to transfer heat energy to the unit medium (e.g., UM') accommodated in the heating chamber 114.

[0082] The aerosol generating device 100 may include a battery 160. The battery 160 may be configured to generate power required for the operation of the aerosol generating device 100. The battery 160 may be configured to supply power to the heater 150. The battery 160 may be configured to supply power to at least one electronic component (e.g., a sensor, a memory, a communication unit, a processor, or other electronic components, or a combination thereof) included in the aerosol generating device 100. For example, the battery 160 may include a lithium polymer battery. The battery 160 may be disposed in a space defined by the device end portion 110B, the partial region of the inner surface of the extension 110C, the portion of the first partition 111C, and the portion of the second partition 111D.

[0083] The aerosol generating device 100 may include a processor 170. The processor 170 may be referred to as a controller. The processor 170 may be configured to process or compute data required for the operation of the aerosol generating device 100 or control an operation

required for the aerosol generating device 100. For example, the processor may be implemented as an array of a plurality of logic gates, or may be implemented as a combination of a general-purpose microprocessor and a memory in which a program executable by the microprocessor is stored.

[0084] The processor 170 may be disposed in a space other than the space in which the battery 160 is disposed. For example, the processor 170 may be disposed in a space defined by the device end portion 1 10B, the partial region of the inner surface of the extension 110C, the portion of the first partition 111C, and the portion of the third partition 111D. The processor 170 may be electrically connected to the battery 160 through at least partial open region of the first partition 111C.

[0085] The processor 170 may be configured to manage the power supplied from the battery 160 to the heater 150. For example, the processor 170 may control the switching of a switching component between the battery 160 and the heater 150.

[0086] The processor 170 may perform data processing based on a sensing value sensed by the sensor (not shown) included in the aerosol generating device 100. In an example, the processor 170 may control the start or end of the operation of the heater 150 based on the pressure in the heating chamber 114 sensed by the pressure sensor. In an example, the processor 170 may control the operation of the heater 150 such that a target temperature of the heating chamber 114 is substantially maintained.

[0087] The aerosol generating device 100 may include a filter 180. The filter 180 may be configured to filter out the aerosol transferred from the heating chamber 114 to the oral cavity or nasal cavity of the user through the mouthpiece 120. The filter 180 may filter out at least some of components included in an aerosol generated from the aerosol generating article 10 without a filter. For example, the binding strength of fine particle and/or powder-form components may be weakened as a binder, included in the unit medium (e.g., UM'), melts due to repetitive heating by the heater 150, and the filter 180 may decrease the penetration of the fine particle and/or powder-form components into the oral cavity or nasal cavity of the user through the mouthpiece 120. The filter 180 may decrease the accumulation of residue in the unit medium (e.g., UM') in the housing 110. The filter 180 may be disposed between the mouthpiece 120 and the heating chamber 114.

[0088] The aerosol generating device 100 may include a cooler 190. The cooler 190 may be configured to adjust, to the target temperature, the temperature of the aerosol transferred from the heating chamber 114 to the oral cavity or the nasal cavity of the user through the mouthpiece 120. For example, the cooler 190 may include a Peltier element. The cooler 190 may be disposed between the mouthpiece 120 and the heating chamber 114. The cooler 190 may be disposed closer to the heating chamber 114 than the filter 180.

[0089] In an embodiment not shown, the aerosol generating device 100 may include a display. The display be configured to visually provide information about the aerosol generating device 100 to the user. For example, the display may provide various kinds of information including a state of the battery 160, a state of the heater 150, a usage state of the aerosol generating device 100. For example, the display may include at least one of a liquid display panel (a liquid crystal display (LCD)), an organic light-emitting display panel (an organic light-emitting diode (OLED)), or one or more light-emitting diodes (LEDs), or a combination thereof.

[0090] In an embodiment not shown, the aerosol generating device 100 may include an actuator. The actuator may be configured to control the operation of the aerosol generating device 100. For example, the actuator may include a button that controls the ON/OFF operation of the aerosol generating device 100.

[0091] FIG. 6 is a diagram illustrating an aerosol generating device according to an embodiment. FIG. 7 is a diagram illustrating an aerosol generating device in which a first membrane is opened, according to an embodiment. FIG. 8 is a diagram illustrating an aerosol generating device in which a second membrane is opened, according to an embodiment. FIG. 9 is a diagram illustrating an aerosol generating device in which a third membrane is opened, according to an embodiment. FIG. 10 is a diagram illustrating an aerosol generating device in which a fourth membrane is opened, according to an embodiment.

[0092] Referring to FIGS. 6 to 10, an aerosol generating device 100-1 may include the heater 150 configured to heat an aerosol generating article 10-1 including a plurality of segments (e.g., S1, S2, S3, and S4). For example, the heater 150 may include a convection heater spaced apart from the aerosol generating article 10-1 without contacting the aerosol generating article 10-1 and configured to heat air around the aerosol generating article 10-1 by convection.

[0093] The plurality of segments (e.g., S1, S2, S3, and S4) may be disposed substantially side-by-side (e.g., juxtapositioned) in the aerosol generating article 10-1. For example, a first segment S1, a second segment S2, a third segment S3, and a fourth segment S4 may be sequentially arranged in one direction (e.g., counterclockwise) in the aerosol generating article 10-1.

[0094] The aerosol generating device 100-1 may include an airflow path adjuster 151. The airflow path adjuster 151 may be configured to form airflow paths (e.g., P1, P2, P3, and P4) passing through one of the plurality of segments (e.g., S1, S2, S3, and S4) in the aerosol generating article 10-1. For example, the airflow path adjuster 151 may form a first airflow path P1 passing through the first segment S1. In this case, the airflow path adjuster 151 may prevent air from passing through the second segment S2, the third segment S3, and the fourth segment S4.

[0095] The airflow path adjuster 151 may include a plu-

rality of membranes (e.g., 152A, 152B, 152C, and 152D). For example, the airflow path adjuster 151 may include a first membrane 152A corresponding to the first segment S1, a second membrane 152B corresponding to the second segment S2, a third membrane 152C corresponding to the third segment S3, and a fourth membrane 152D corresponding to the fourth segment S4.

[0096] The plurality of membranes (e.g., 152A, 152B, 152C, and 152D) may be configured to be opened and closed. In an example, the plurality of membranes (e.g., 152A, 152B, 152C, and 152D) may elastically deform to be opened and closed. In an example, the plurality of membranes (e.g., 152A, 152B, 152C, and 152D) may be opened and closed by a mechanical actuator (not shown). In an example, the plurality of membranes (e.g., 152A, 152B, 152C, and 152D) may be opened and closed by an electrical/electronic driver (not shown).

[0097] Air heated by the heater 150 may be guided to flow through a segment corresponding to each of the membranes through each of the membranes. For example, the first membrane 152A may be opened while the second membrane 152B, the third membrane 152C, and the fourth membrane 152D may be closed such that the air heated by the heater 150 flows through the first membrane 152A to the first segment S1 and not to the other segments (e.g., the second segment S2, the third segment S3, and/or the fourth segment S4).

[0098] Opening degrees of the plurality of membranes (e.g., 152A, 152B, 152C, and 152D) may be adjusted. A membrane (e.g., 152A, 152B, 152C, and 152D) may generally transition from a first state of being closed to a second state of being at least partially opened. In the second state, the membrane (e.g., 152A, 152B, 152C, and 152D) may be partially (e.g., about 70%) or completely (e.g., about 100%) opened. The membrane (e.g., 152A, 152B, 152C, and 152D) may transition from the second state to the first state.

[0099] The opening operation of the plurality of membranes (e.g., 152A, 152B, 152C, and 152D) may interoperate with each other. For example, the second membrane 152B, the third membrane 152C, and the fourth membrane 152D may perform closing operations dependent on the opening operation of the first membrane 152A.

[0100] The opening and closing operations of the plurality of membranes (e.g., 152A, 152B, 152C, and 152D) may also be performed independently. For example, the second membrane 152B, the third membrane 152C, and the fourth membrane 152D may be configured to remain closed while the first membrane 152A is opened.

[0101] The opening and closing operations of the plurality of membranes (e.g., 152A, 152B, 152C, and 152D) may be performed in a predetermined order. For example, sequentially referring to FIGS. 7 to 10, states of the first membrane 152A, the second membrane 152B, the third membrane 152C, and the fourth membrane 152D may be opened, closed, closed, and closed, respectively, at a first time, closed, opened, closed, and closed, respectively, at a second time after the first time, closed, closed, opened, and closed, respectively, at a third time after the second time, and closed, closed, closed, and opened, respectively, at a fourth time after the third time.

[0102] The plurality of membranes (e.g., 152A, 152B, 152C, and 152D) may be disposed between the heater 150 and the aerosol generating article 10-1. The plurality of membranes (e.g., 152A, 152B, 152C, and 152D) may be spaced apart from the heater 150 and/or the aerosol generating article 10-1.

[0103] The plurality of membranes (e.g., 152A, 152B, 152C, and 152D) may include elastically deformable materials. The plurality of membranes (e.g., 152A, 152B, 152C, and 152D) may include predetermined heat-resistant materials suitable for withstanding fatigue caused by repetitive operations (e.g., opening and closing operations).

[0104] FIG. 11 is a diagram illustrating an aerosol generating device in which a first airflow path is formed, according to an embodiment. FIG. 12 is a diagram illustrating an aerosol generating device in which a second airflow path is formed, according to an embodiment. FIG. 13 is a diagram illustrating an aerosol generating device in which a third airflow path is formed, according to an embodiment.

[0105] Referring to FIGS. 11 to 13, an aerosol generating device 100-2 may include an airflow path adjuster 151-1 configured to form airflow paths (e.g., P1, P2, and P3) passing through one of a plurality of segments (e.g., S1, S2, and S3) in the aerosol generating article 10-1.

[0106] The plurality of airflow paths (e.g., P1, P2, and P3) may be formed in a substantially vertical configuration. In the aerosol generating device 100-2, an upstream end of each of the airflow paths (e.g., P1, P2, and P3) may be located relatively lower than a downstream end of each of the airflow paths (e.g., P1, P2, and P3). For example, a heater (not shown) located relatively at a bottom portion of the aerosol generating device 100-2 may be adjacent to the upstream end of each of the airflow paths (e.g., P1, P2, and P3), while a mouthpiece (not shown) located relatively at an upper portion of the aerosol generating device 100-2 may be adjacent to the downstream end of each of the airflow paths (e.g., P1, P2, and P3).

[0107] The plurality of airflow paths (e.g., P1, P2, and P3) may be disposed in parallel. Here, the term "disposed in parallel" may describe that an airflow path is divided into a first airflow path P1, a second airflow path P2, and a third airflow path P3. In other words, the plurality of airflow paths (e.g., P1, P2, and P3) is disposed such that air passing through the first airflow path P1 does not pass through the second airflow path P2 and the third airflow path P3.

[0108] The airflow path adjuster 151-1 may include a first membrane M1. The first membrane M1 may include a first upstream membrane M11 adjacent to an upstream end of the first segment S1 and a first downstream membrane M12 adjacent to a downstream end of the first seg-

ment S1. The first upstream membrane M11 and the first downstream membrane M12 may be configured to be substantially opened and closed simultaneously.

[0109] The airflow path adjuster 151-1 may include a second membrane M2. The second membrane M2 may include a second upstream membrane M21 adjacent to an upstream end of the second segment S2 and a second downstream membrane M22 adjacent to a downstream end of the second segment S2. The second upstream membrane M21 and the second downstream membrane M22 may be configured to be substantially opened and closed simultaneously.

[0110] The airflow path adjuster 151-1 may include a third membrane M3. The third membrane M3 may include a third upstream membrane M31 adjacent to an upstream end of the third segment S3 and a third downstream membrane M32 adjacent to a downstream end of the third segment S3. The third upstream membrane M31 and the third downstream membrane M32 may be configured to be substantially opened and closed simultaneously.

[0111] The first membrane M1, the second membrane M2, and the third membrane M3 may be configured to be optionally opened or closed. For example, in order to form the first airflow path P1 passing through the first segment S1, the first upstream membrane M11 and the first downstream membrane M12 may be at least partially opened, while the second upstream membrane M21, the second downstream membrane M22, the third upstream membrane M31, and the third downstream membrane M32 may be closed.

[0112] FIG. 14 is a diagram illustrating an aerosol generating device in which a first airflow path is formed, according to an embodiment. FIG. 15 is a diagram illustrating an aerosol generating device in which a second airflow path is formed, according to an embodiment. FIG. 16 is a diagram illustrating an aerosol generating device in which a third airflow path is formed, according to an embodiment.

[0113] Referring to FIGS. 14 to 16, an aerosol generating device 100-3 may include an airflow path adjuster 151-2 configured to form a plurality of airflow paths (e.g., P1, P2, and P3) passing through one of a plurality of segments (e.g., S1, S2, and S3) in the aerosol generating article 10-1.

[0114] The plurality of airflow paths (e.g., P1, P2, and P3) may be formed in a substantially horizontal configuration. The upstream end of each of the airflow paths (e.g., P1, P2, and P3) may be located on a first side (e.g., left side) of the aerosol generating device 100-3 and the downstream end of each of the airflow paths (e.g., P1, P2, and P3) may be located on a second side (e.g., right side) opposite to the first side of the aerosol generating device 100-3.

[0115] The airflow path adjuster 151-2 may include the first membrane M1 including the first upstream membrane M11 and the first downstream membrane M12, the second membrane M2 including the second upstream membrane M21 and the second downstream membrane M22, and the third membrane M3 including the third upstream membrane M31 and the third downstream membrane M32.

[0116] The airflow path adjuster 151-2 may include an inlet manifold MI. The inlet manifold MI may be connected to the first upstream membrane M11, the second upstream membrane M21, and the third upstream membrane M31. Air heated by a heater (not shown) may be guided to pass through the inlet manifold MI to flow through one of the first upstream membrane M11, the second upstream membrane M21, and the third upstream membrane M31.

[0117] The airflow path adjuster 151-2 may include an outlet manifold MO. The outlet manifold MO may be connected to the first downstream membrane M12, the second downstream membrane M22, and the third downstream membrane M32. Air passing through a segment may pass through a downstream membrane corresponding to the segment, go through the outlet manifold MO, and be transferred to a user through a mouthpiece (not shown).

[0118] The inlet manifold MI and the outlet manifold MO may at least partially enclose the aerosol generating article 10-1. For example, the inlet manifold MI may be disposed on a first side (e.g., left side) of the aerosol generating article 10-1 and the outlet manifold MO may be disposed on a second side (e.g., right side) opposite to the first side of the aerosol generating article 10-1. The inlet manifold MI may face the first upstream membrane M11, the second upstream membrane M21, and the third upstream membrane M31. The outlet manifold MO may face the first downstream membrane M12, the second downstream membrane M22, and the third downstream membrane M32.

[0119] FIG. 17 is a diagram illustrating an aerosol generating device receiving a temperature profile from an external device, according to an embodiment.

[0120] Referring to FIG. 17, an aerosol generating device 100-4 may include a communication unit 171 configured to communicate with an external device 101 via a network in a network environment. The communication unit 171 may be configured to communicate with the external device 101 via a short-range wireless communication network. For example, the communication unit 171 may include at least one of a Bluetooth® communication unit, a Bluetooth low energy (BLE) communication unit, a near field communication unit, a wireless local area network (WLAN) (wireless fidelity (Wi-Fi)) communication unit, a ZigBee communication unit, an infrared data association (IrDA) communication unit, a Wi-Fi direct (WFD) communication unit, an ultra-wideband (UWB) communication unit, or an Ant+ communication unit, or a combination thereof.

[0121] The communication unit 171 be configured such that the aerosol generating device 100-4 automatically or manually (e.g., by a user input) receives firmware code from the external device 101 when the aerosol gen-

erating device 100-4 is in close proximity to the external device 101 within a determined distance range or in contact with the external device 101.

[0122] The external device 101 may be configured to manufacture an aerosol generating article (e.g., the aerosol generating article 10 of FIG. 1 and/or the aerosol generating article 10-1 of FIG. 4). The external device 101 may store information corresponding to a unit medium (e.g., the unit mediums U1 to U10, UA, and UB) in a determined form. For example, the external device 101 may store information about a temperature profile corresponding to a layer (e.g., the first layer L1 and/or the second layer L2 of FIG. 2) included in the unit medium. The external device 101 may be configured to update the information about the temperature profile each time the aerosol generating article is manufactured.

[0123] The temperature profile may be related to information about at least one component included in the layer. The temperature profile may include at least one of a target temperature for each section, a temperature gradient, a heating time, a thickness of a layer in a section, or other relevant heating parameters, or a combination thereof. For example, when a first tobacco component contained in a layer included in a first section (e.g., a first unit medium) of the aerosol generating article is fluecured tobacco and a second tobacco component contained in a layer included in a second section (e.g., a second unit medium) is orient tobacco, a temperature profile corresponding to the first section may be different from a temperature profile corresponding to the second section.

[0124] The communication unit 171 may be configured to receive information including the temperature profile from the external device 101. The information about the temperature profile received by the communication unit 171 may be transmitted to the processor 170. The processor 170 may be configured to update the temperature profile in a memory (not shown). The processor 170 may enable a heater (not shown) to operate under a heating condition appropriate to a corresponding section of an aerosol generating article that the aerosol generating device 100-4 desires to heat based on the information about the temperature profile for each section of the aerosol generating article. This allows the aerosol generating article to vary a heating condition of the heater according to sections, each containing different tobacco components, thereby achieving an optimal tobacco flavor. In addition, by varying a heating temperature based on the thickness of a layer included in a corresponding section of the aerosol generating article, a desired and uniform amount of atomization may be produced while the aerosol generating device 100-4 is being used.

[0125] FIG. 18 is a diagram illustrating an aerosol generating device changing a heating condition of a heater using a temperature profile corresponding to a section of a single segment of an aerosol generating article according to an embodiment.

[0126] Referring to FIG. 18, an aerosol generating article (e.g., the aerosol generating article 10 of FIG. 1) may be implemented as a single segment S. The single segment S may include a plurality of sections (e.g., T1 to T5). A section may be substantially the same as a unit medium (e.g., the unit mediums U1 to U10) in the segment S. The section may include at least a portion of a unit medium (e.g., the first unit medium U1) in the segment S and at least a portion of another unit medium (e.g., the second unit medium U2) adjacent to the unit medium. The section may at least partially include three or more unit mediums.

[0127] An aerosol generating device 100-5 may be configured to receive, from an external device 101-1, a temperature profile of each of the plurality of sections (e.g., T11 to T15) defining the single segment S of the aerosol generating article through the communication unit 171. The processor 170 may be configured to control the operation of the heater 150 based on the temperature profile of each of the plurality of sections (e.g., T11 to T15) received by the communication unit 171. For example, the processor 170 may enable the heater 150 to operate under a first heating condition based on a temperature profile corresponding to a first section T11 in order to heat a portion corresponding to the first section T11 of the single segment S of the aerosol generating article first. Then, it may be possible to enable the heater 150 to operate under a second heating condition other than the first heating condition based on a temperature profile corresponding to a third section T13 in order to heat a portion corresponding to the third section T3. As described above, the processor 170 may change the heating condition of the heater 150 according to the sections (e.g., T11 to T15).

[0128] FIG. 19 is a diagram illustrating an aerosol generating device changing a heating condition of a heater using a temperature profile corresponding to a section of a segment of a plurality of segments of an aerosol generating article according to an embodiment.

[0129] Referring to FIG. 19, an aerosol generating article (e.g., the aerosol generating article 10-1 of FIG. 4) may be implemented as a plurality of segments (e.g., S1 and S2). Each of the segments may include a plurality of sections (e.g., T11 to T13 and T21 to T23). A section may be substantially the same as a unit medium (e.g., the unit mediums UA and UB) in a segment. The section may include at least a portion of a unit medium (e.g., the unit mediums UA and UB) and at least a portion of another unit medium (e.g., the unit mediums UA and UB) adjacent to the unit medium. The section may at least partially include three or more unit mediums.

[0130] An aerosol generating device 100-6 may be configured to receive, from an external device 101-2, a temperature profile of each of the plurality of sections (e.g., T11 to T13 and T21 to T23) defining each of the plurality of segments (e.g., S1 and S2) of the aerosol generating article through the communication unit 171. The processor 170 may determine which segment among the plurality of segments (S1 and S2) to heat.

Then, the processor 170 may instruct the heater 150 to heat a section (e.g., the second section T12) included in a segment to be heated (e.g., the first segment S1). The processor 170 may enable the heater 150 to operate under the first heating condition based on a temperature profile corresponding to a target heating section (e.g., the second section T12). Then, the processor 170 may instruct the heater 150 to heat another section (e.g., the third section T13) included in the segment to be heated (e.g., the first segment S1). The processor 170 may enable the heater 150 to operate under another heating condition other than the first heating condition based on a temperature profile corresponding to the new target heating section (e.g., the third section T13). Alternatively, the processor 170 may enable the heater 150 to operate under the first heating condition and then determine which segment among the plurality of segments (e.g., S1 and S2) to heat. Then, when the target heating segment is changed, the processor 170 may instruct the heater 150 to heat the new target heating segment (e.g., the second segment S2). The processor 170 may enable the heater 150 to operate under a third heating condition based on a temperature profile corresponding to a section (e.g., a fourth section T21) included in the new target heating segment.

[0131] The methods according to the above-described embodiments may be recorded in non-transitory computer-readable media including program instructions to implement various operations of the above-described embodiments. The media may also include, alone or in combination with the program instructions, data files, data structures, and the like. The program instructions recorded on the media may be those specially designed and constructed for the purposes of embodiments, or they may be of the kind well-known and available to those having skill in the computer software arts. Examples of non-transitory computer-readable media include magnetic media such as hard disks, floppy disks, and magnetic tape; optical media such as CD-ROM discs or DVDs; magneto-optical media such as floptical disks; and hardware devices that are specially configured to store and perform program instructions, such as read-only memory (ROM), random access memory (RAM), flash memory, and the like. Examples of program instructions include both machine code, such as produced by a compiler, and files containing higher-level code that may be executed by the computer using an interpreter. The above-described hardware devices may be configured to act as one or more software modules in order to perform the operations of the embodiments, or vice versa.

[0132] Software may include a computer program, a piece of code, an instruction, or some combination thereof, to independently or collectively instruct or configure the processing device to operate as desired. Software and data may be embodied permanently or temporarily in any type of machine, component, physical or virtual equipment, computer storage medium or device, or in a propagated signal wave capable of providing instructions or data to or being interpreted by the processing device. The software also may be distributed over network-coupled computer systems so that the software is stored and executed in a distributed fashion. The software and data may be stored by one or more non-transitory computer-readable recording mediums.

[0133] Although the embodiments have been described with reference to the limited drawings, one of ordinary skill in the art may apply various technical modifications and variations based thereon. For example, suitable results may be achieved if the described techniques are performed in a different order, and/or if components in a described system, architecture, device, or circuit are combined in a different manner, and/or replaced or supplemented by other components or their equivalents.

[0134] Therefore, other implementations, other embodiments, and/or equivalents of the claims are within the scope of the following claims.

Claims

1. An aerosol generating device comprising:

   a heater configured to heat an aerosol generating article, wherein the aerosol generating article comprises a plurality of segments separated from each other, and each segment comprises a plurality of sections;
   an airflow path adjuster configured to form an airflow path passing through a segment of the plurality of segments; and
   a processor configured to operate the heater under a first heating condition using a first temperature profile corresponding to a first section of the plurality of sections of the segment through which the airflow path is formed.

2. The aerosol generating device of claim 1, wherein the processor is configured to change the first heating condition of the heater to a second heating condition using a second temperature profile corresponding to a second section of the plurality of sections of the segment through which the airflow path is formed.

3. The aerosol generating device of claim 1, wherein the airflow path adjuster comprises a plurality of flexible membranes respectively corresponding to the plurality of segments, wherein opening degrees of the plurality of flexible membranes are configured to be adjusted.

4. The aerosol generating device of claim 3, wherein, when a membrane of the plurality of flexible membranes is at least partially opened, at least one re-

maining membrane is configured to be closed.

5. The aerosol generating device of claim 1, wherein a plurality of airflow paths respectively passing through the plurality of segments is disposed in parallel.

6. The aerosol generating device of claim 1, wherein the processor is configured to receive an updated temperature profile from an external device.

7. The aerosol generating device of claim 6, wherein the processor is configured to receive the temperature profile from the external device in a form of firmware code.

8. The aerosol generating device of claim 6, wherein the processor is configured to receive the temperature profile from the external device via wireless communication.

9. The aerosol generating device of claim 1, wherein the first section comprises a unit medium of a plurality of unit mediums defining the segment, wherein the unit medium comprises a plurality of components and a pore defined between the plurality of components.

10. The aerosol generating device of claim 1, wherein the heater comprises a convection heater configured to heat the aerosol generating article by convection.

11. An aerosol generating device comprising:

a heater configured to heat an aerosol generating article, wherein the aerosol generating article comprises a segment, and the segment comprises a plurality of sections; and
a processor configured to operate the heater using a first temperature profile corresponding to a first section of the plurality of sections.

12. The aerosol generating device of claim 11, wherein the processor is configured to change a first heating condition of the heater to a second heating condition using a second temperature profile corresponding to a second section of the plurality of sections.

13. The aerosol generating device of claim 11, wherein the processor is configured to receive an updated temperature profile from an external device.

14. The aerosol generating device of claim 13, wherein the processor is configured to receive the temperature profile from the external device in a form of firmware code.

15. The aerosol generating device of claim 13, wherein the processor is configured to receive the temperature profile from the external device via wireless communication.

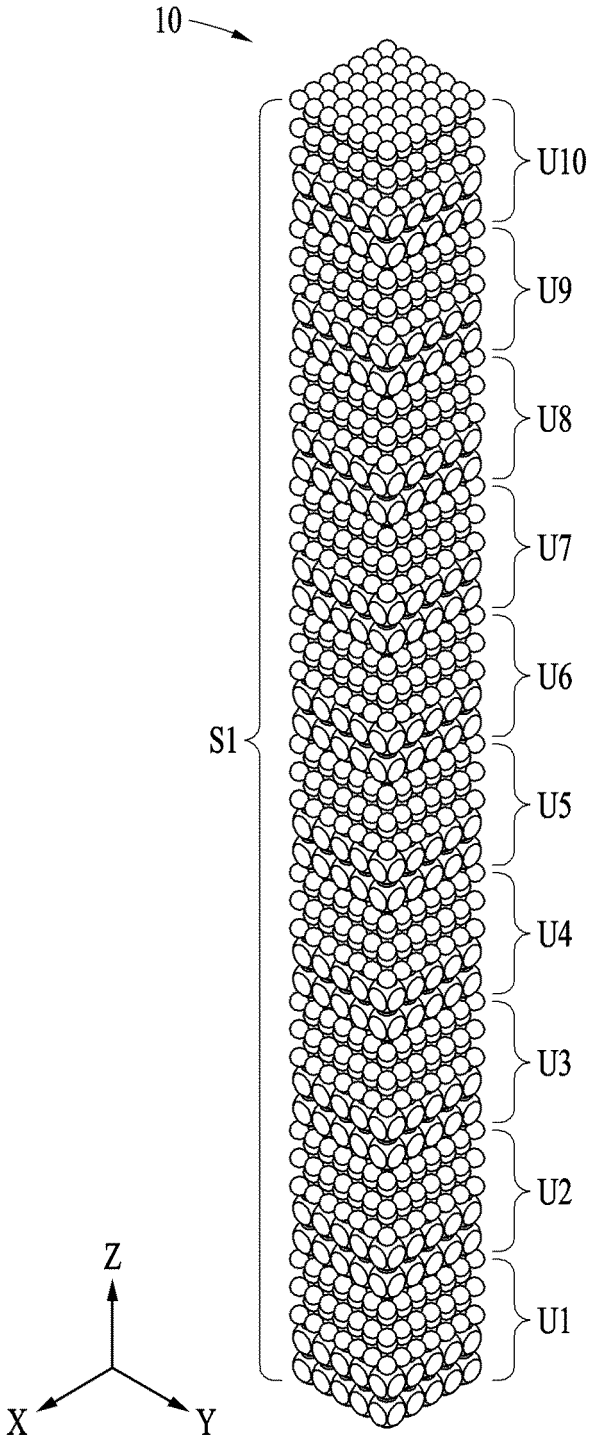


FIG. 1

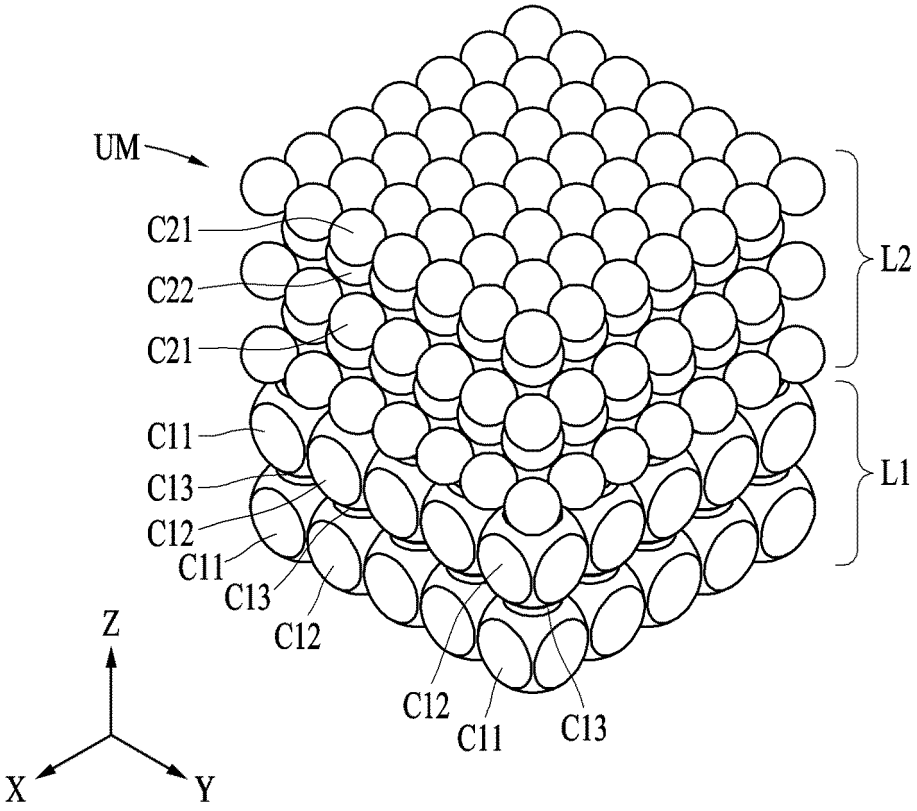


FIG. 2

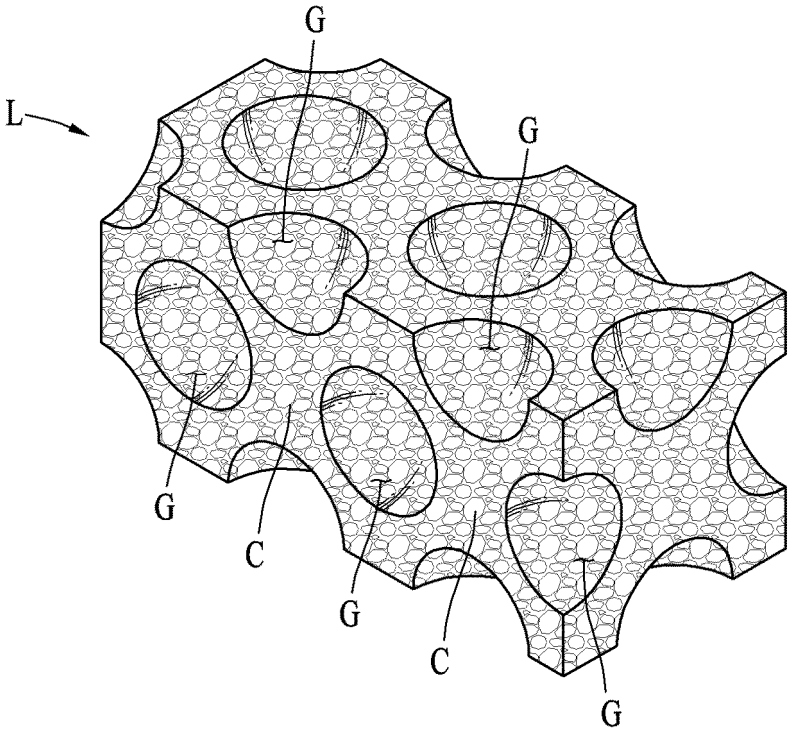


FIG. 3

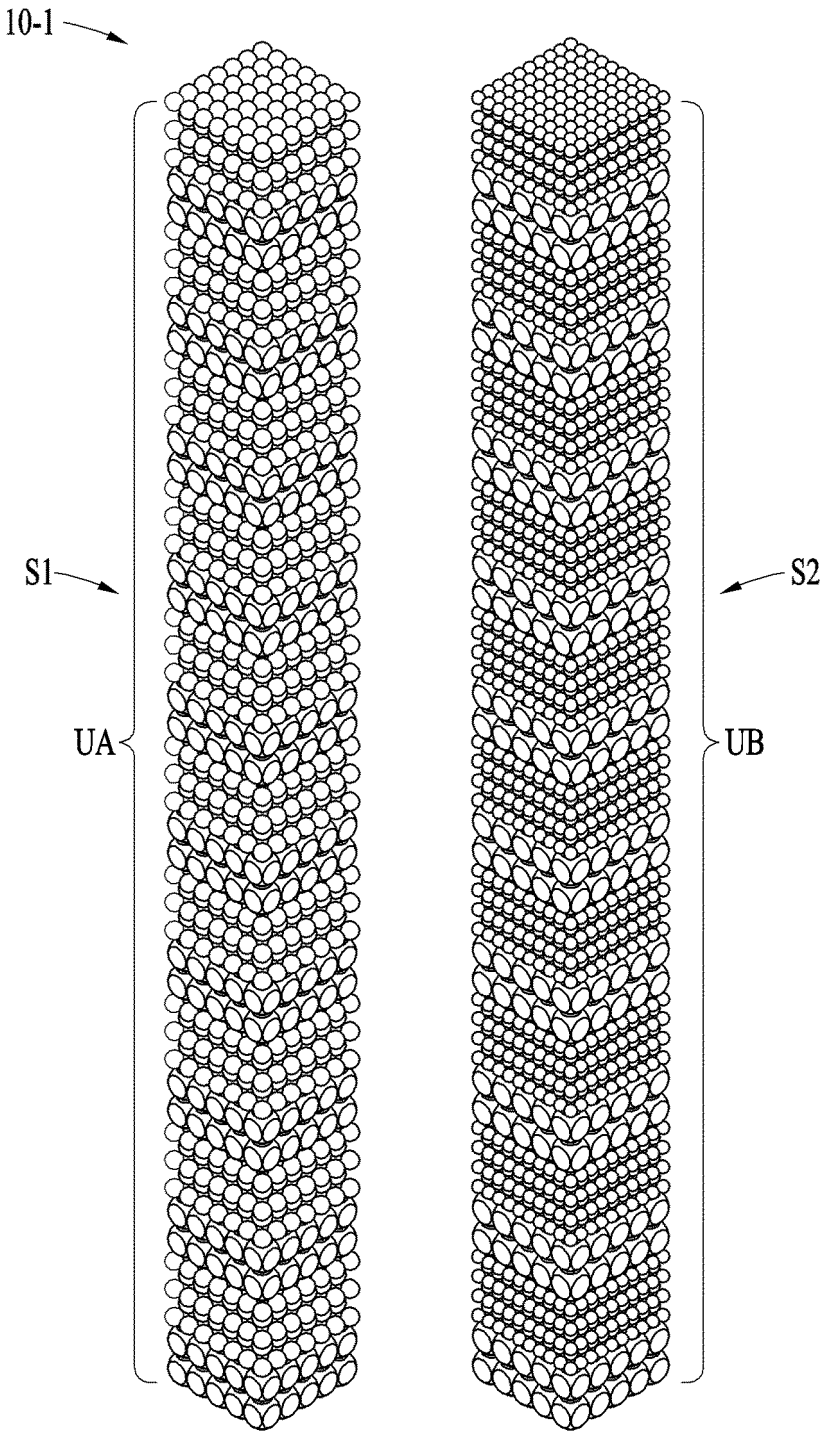
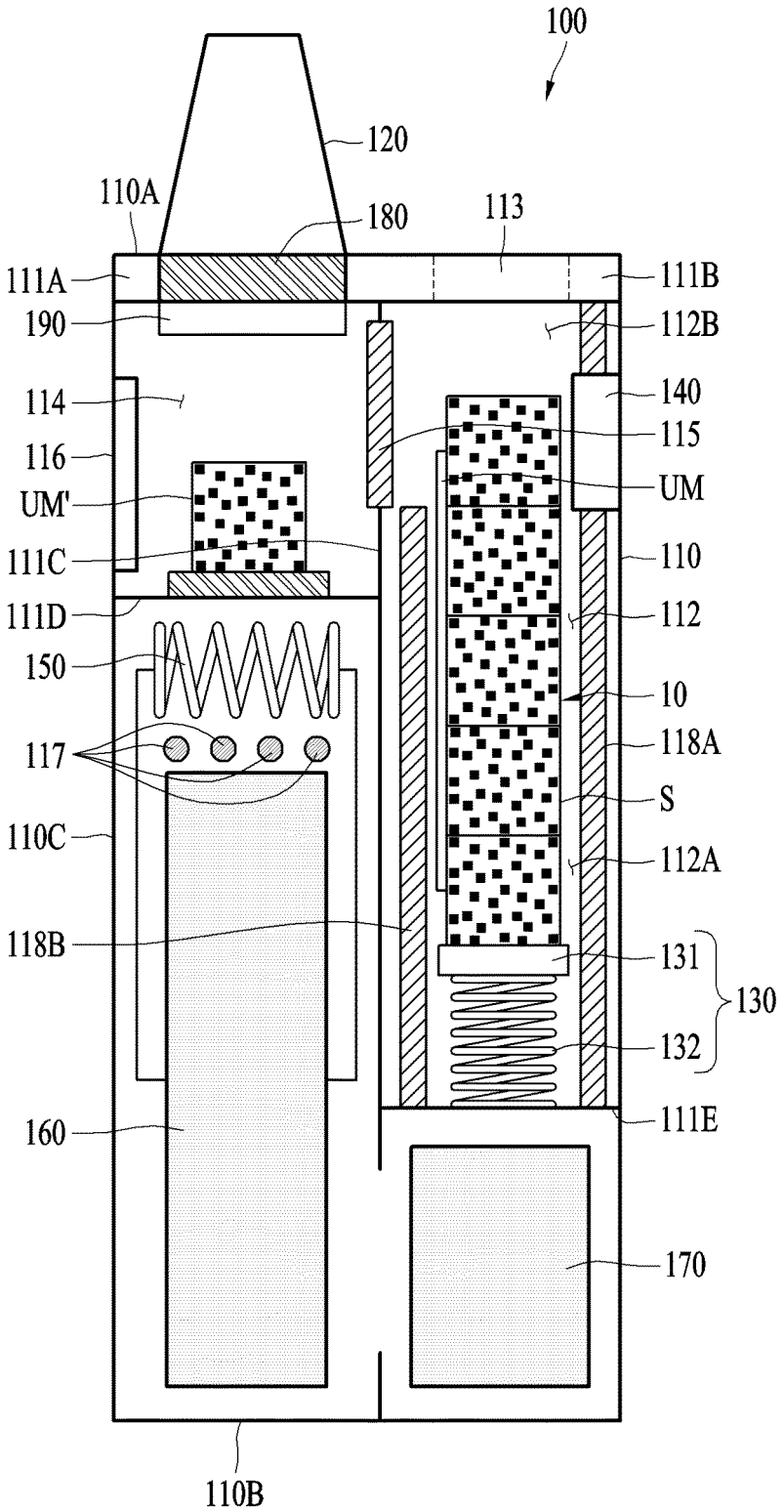


FIG. 4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120
110A
180
113
111A
111B
190
112B
114
140
115
116
UM
UM'
110
111C
111D
112
150
10
118A
117
S
110C
112A
118B
131
130
132
160
111E
170
110B

FIG. 5

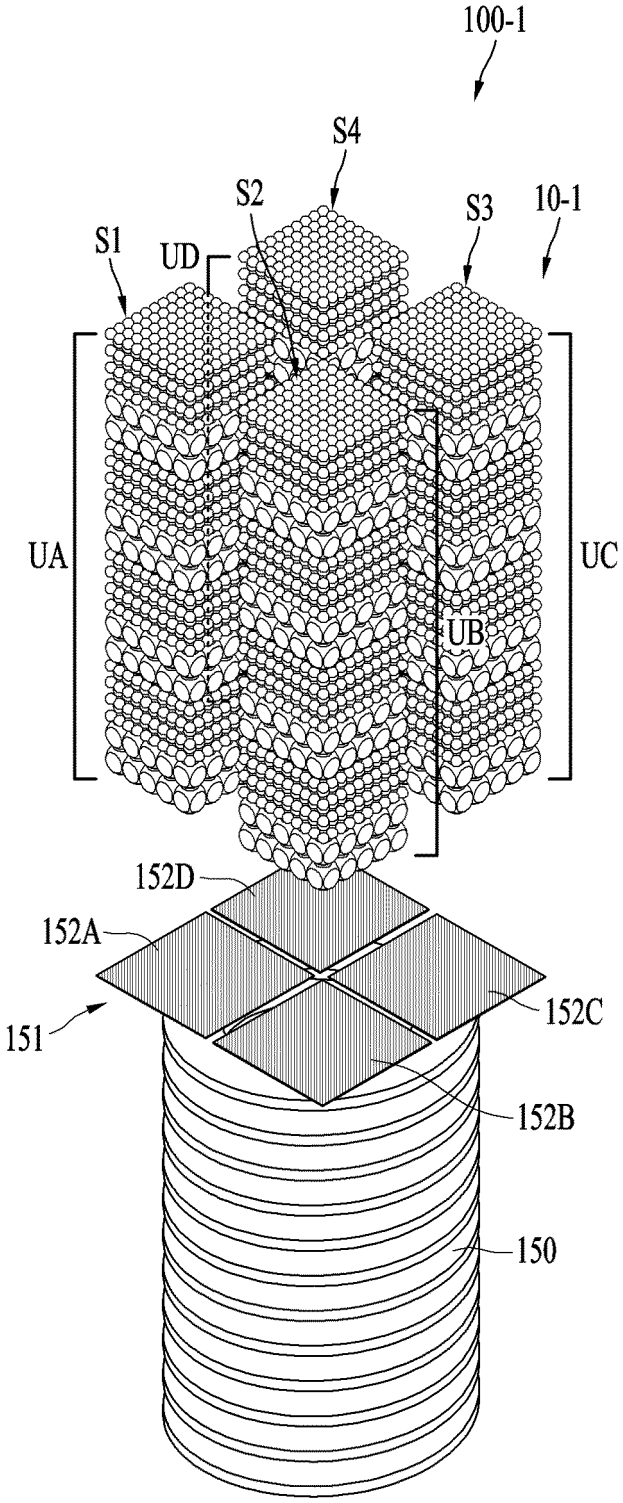


FIG. 6

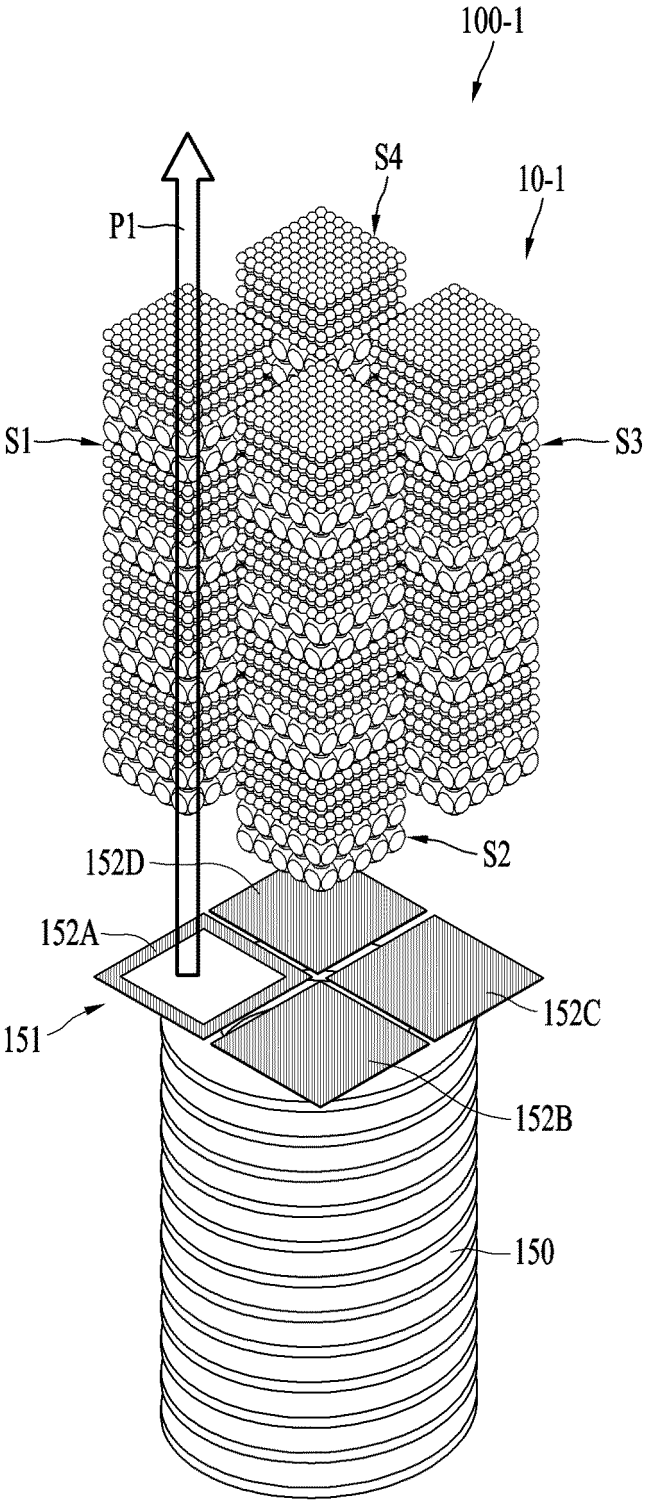


FIG. 7

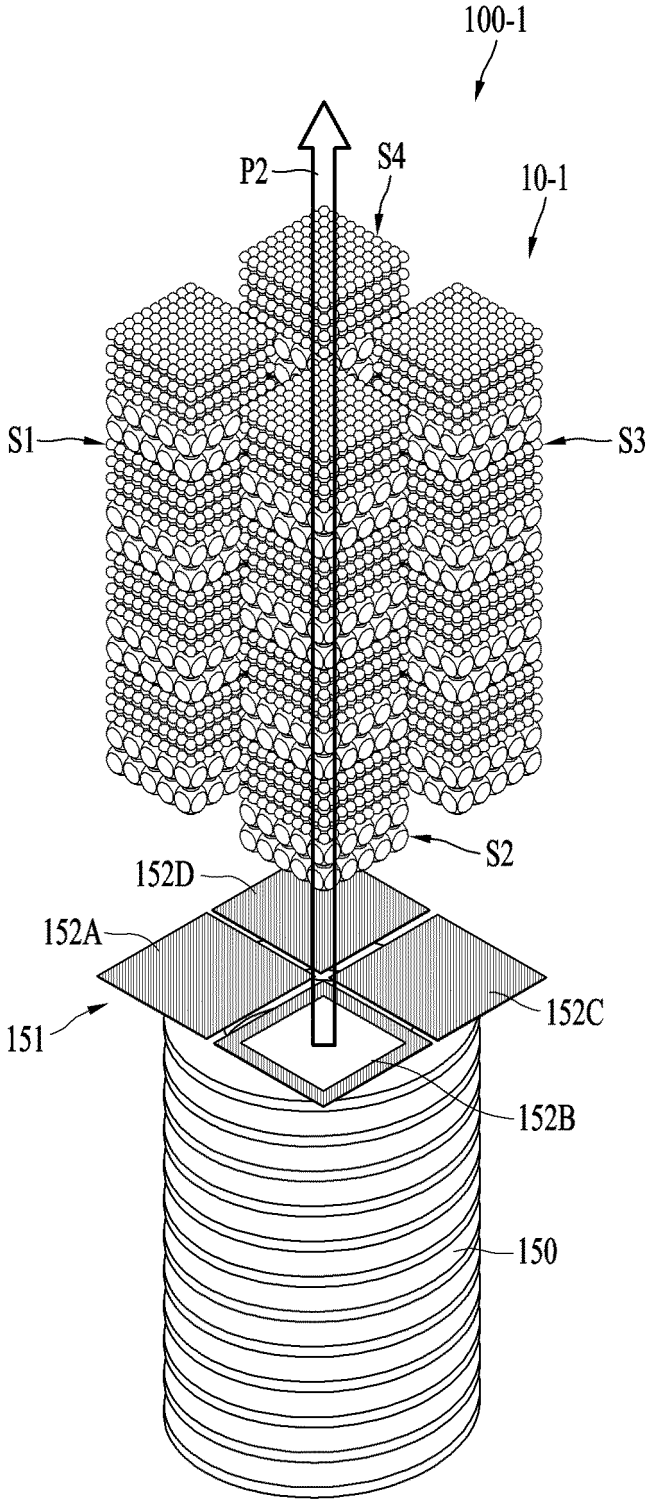


FIG. 8

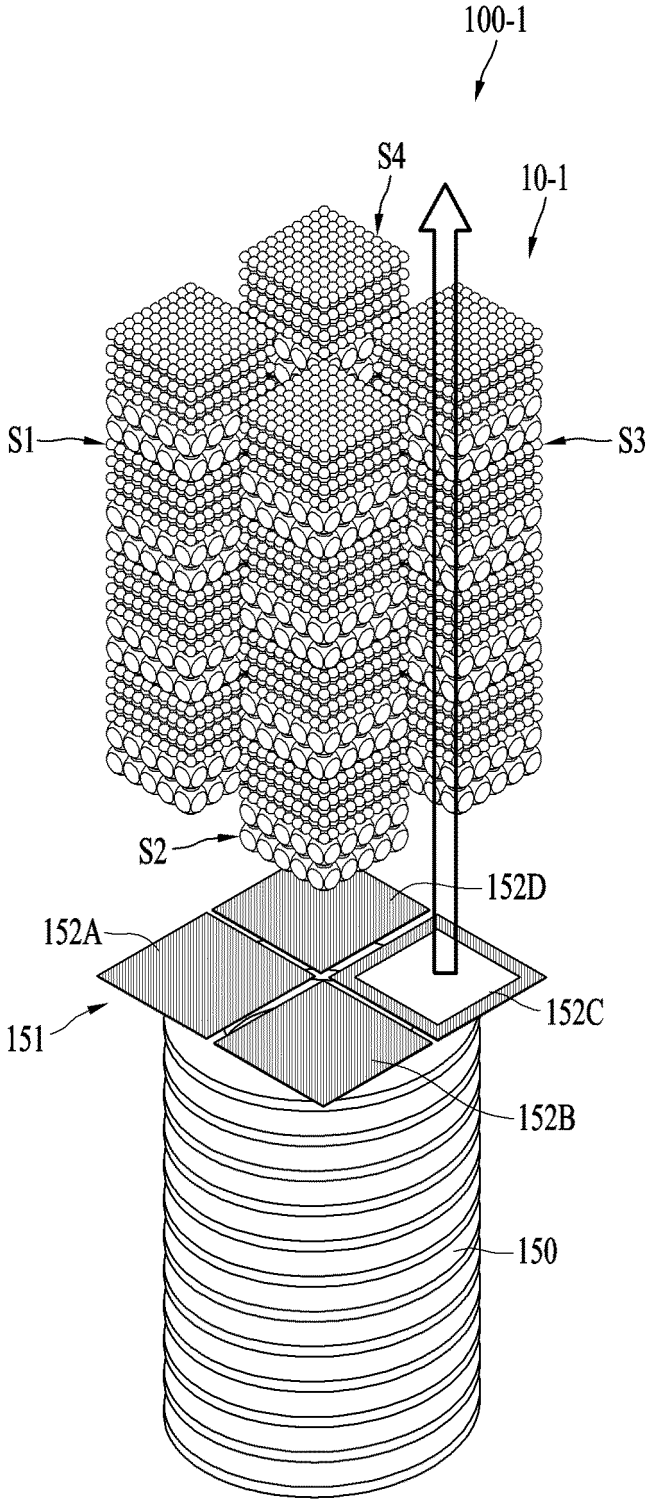


FIG. 9

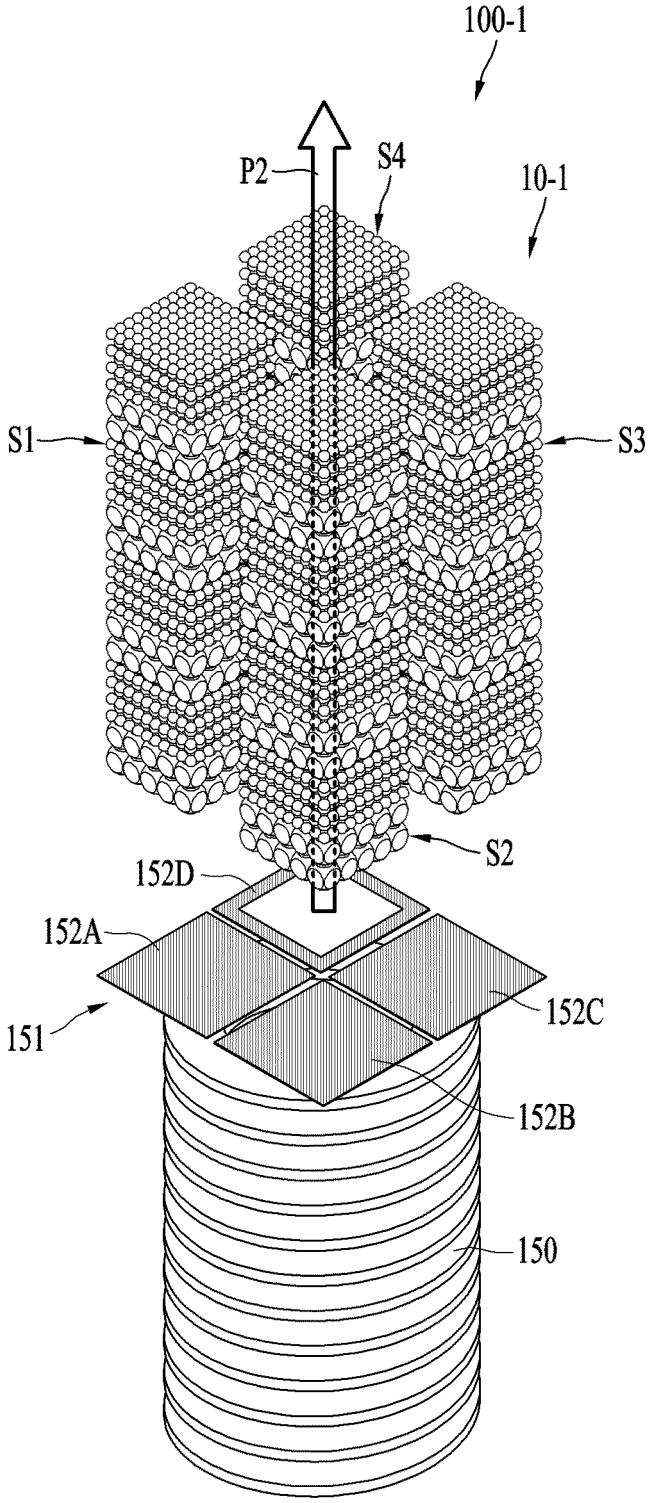
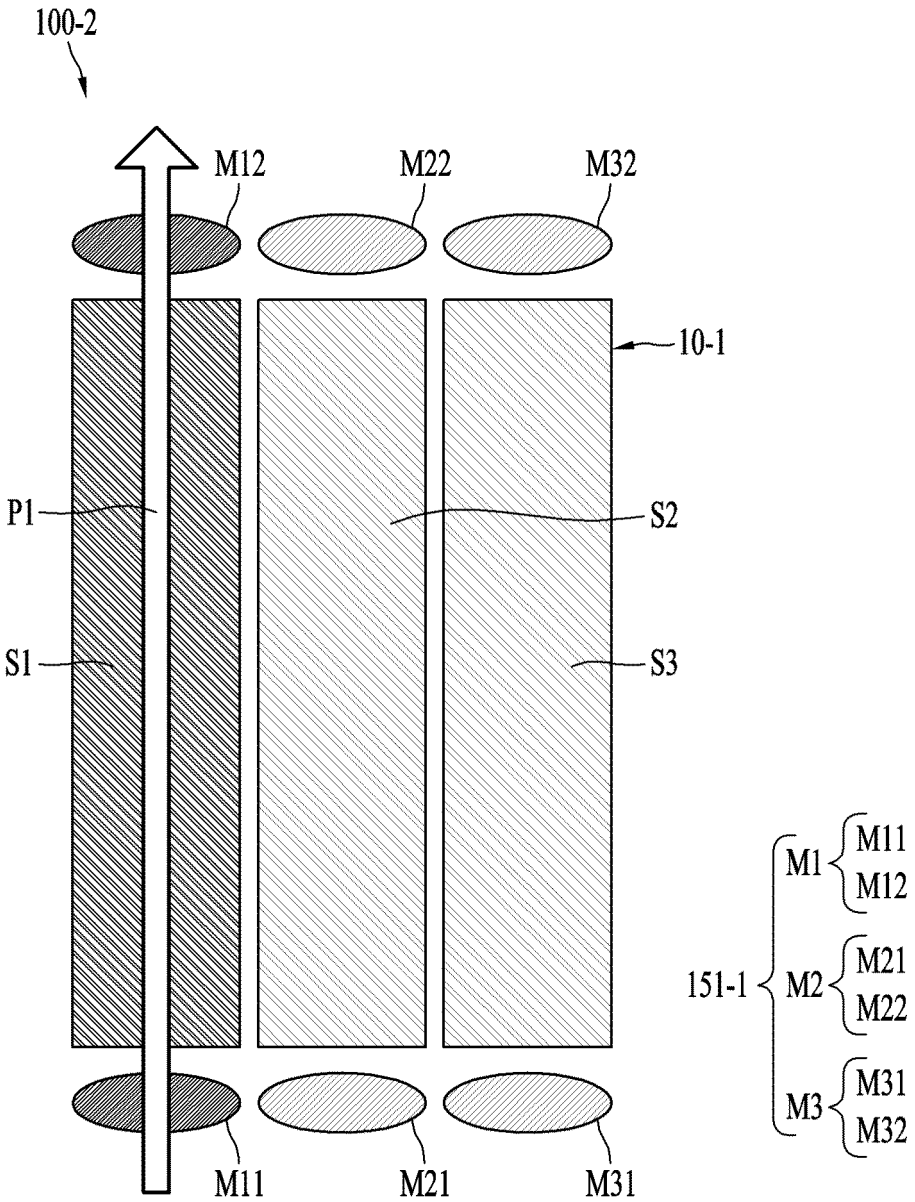


FIG. 10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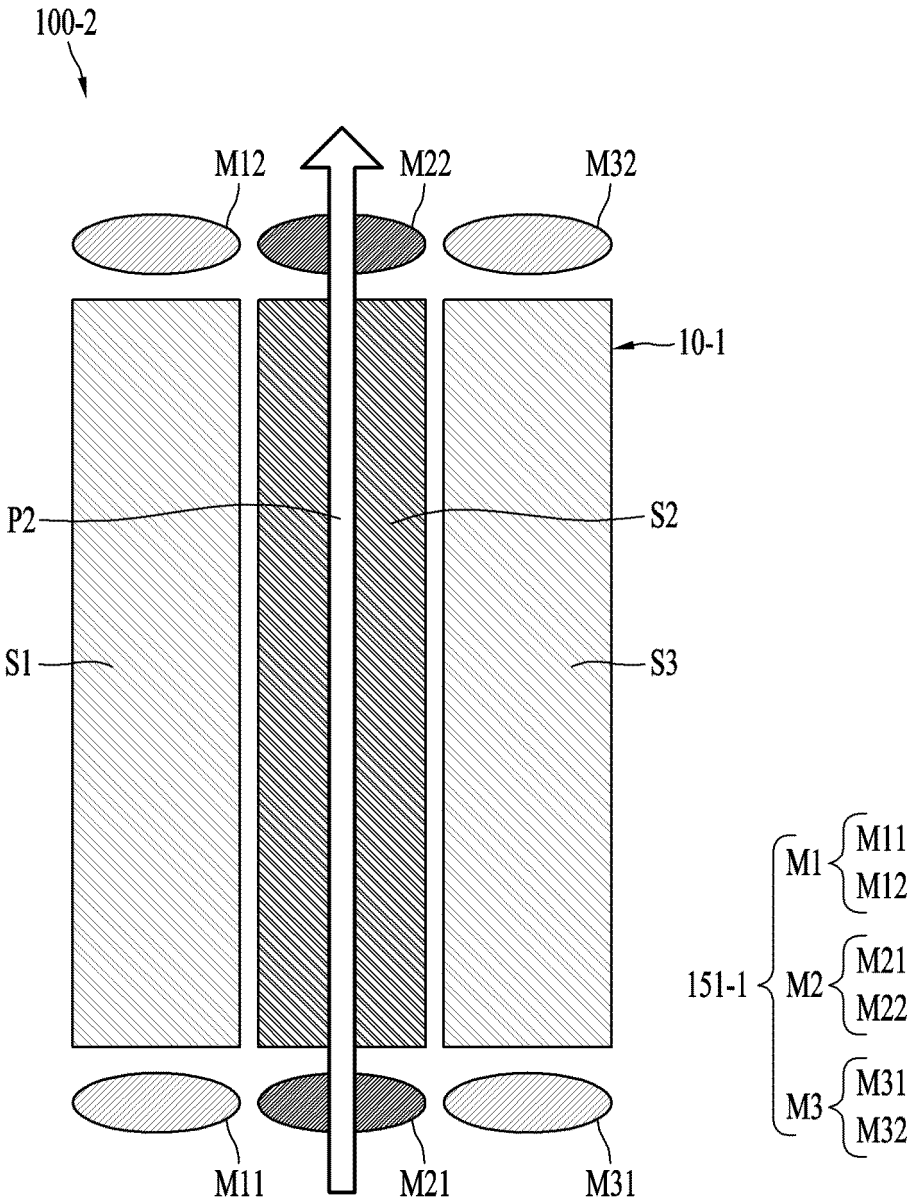
M22
M32
10-1
P1
S2
S1
S3
M11
M21
M31
151-1
M1
M11
M12
M2
M21
M22
M3
M31
M32

FIG. 11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S2
S1
S3
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M12
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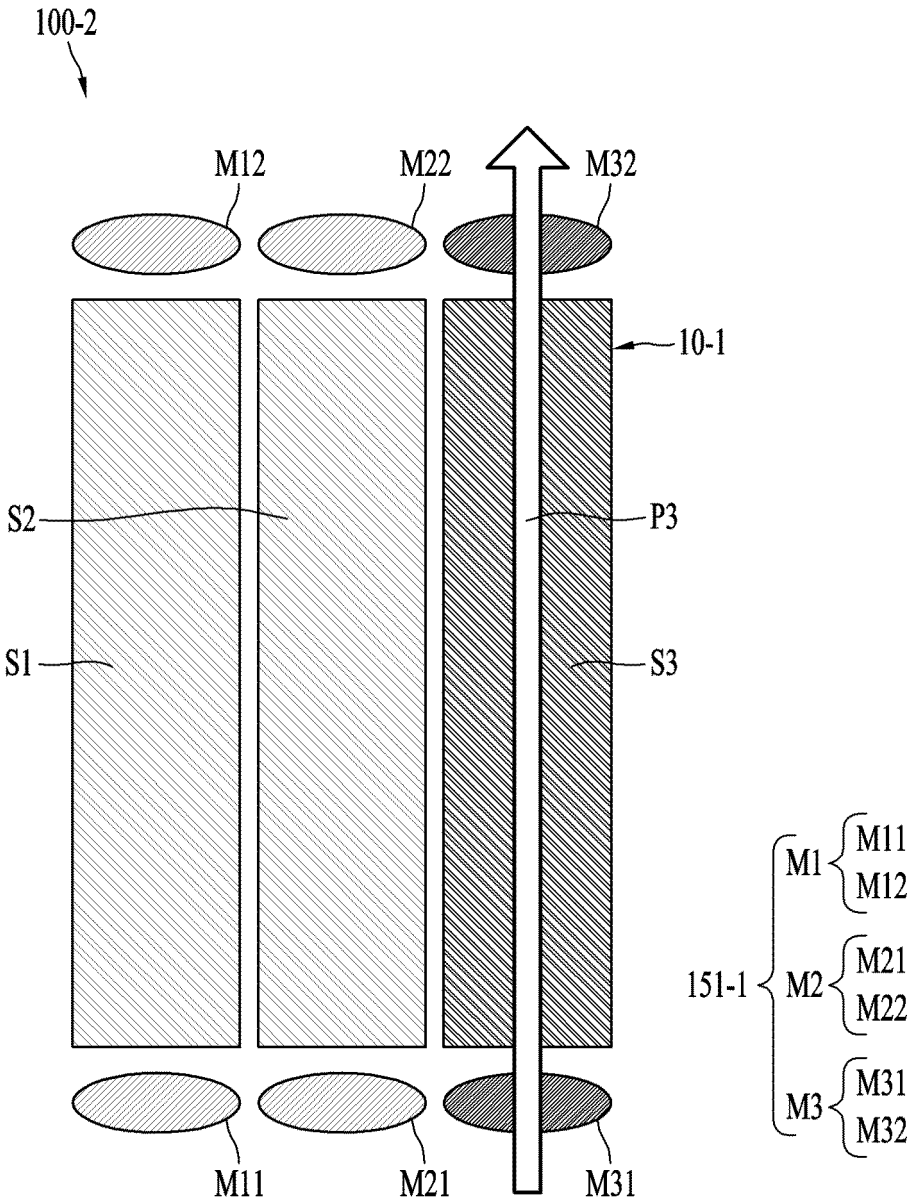
M21
M22
M3
M31
M32
M11
M21
M31

FIG. 12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M21
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M3
M31
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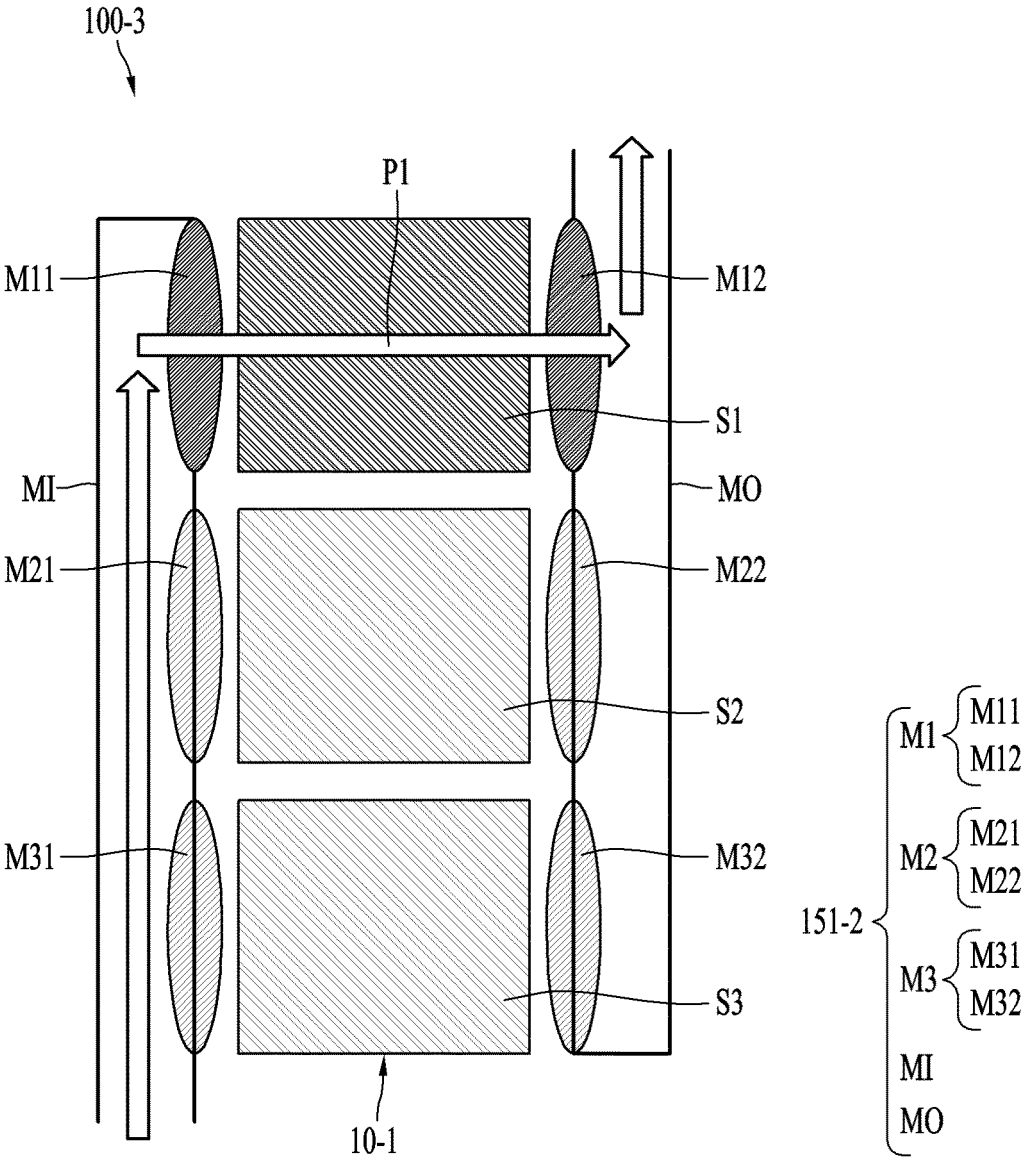
FIG. 13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M22
S2
M31
M32
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M1
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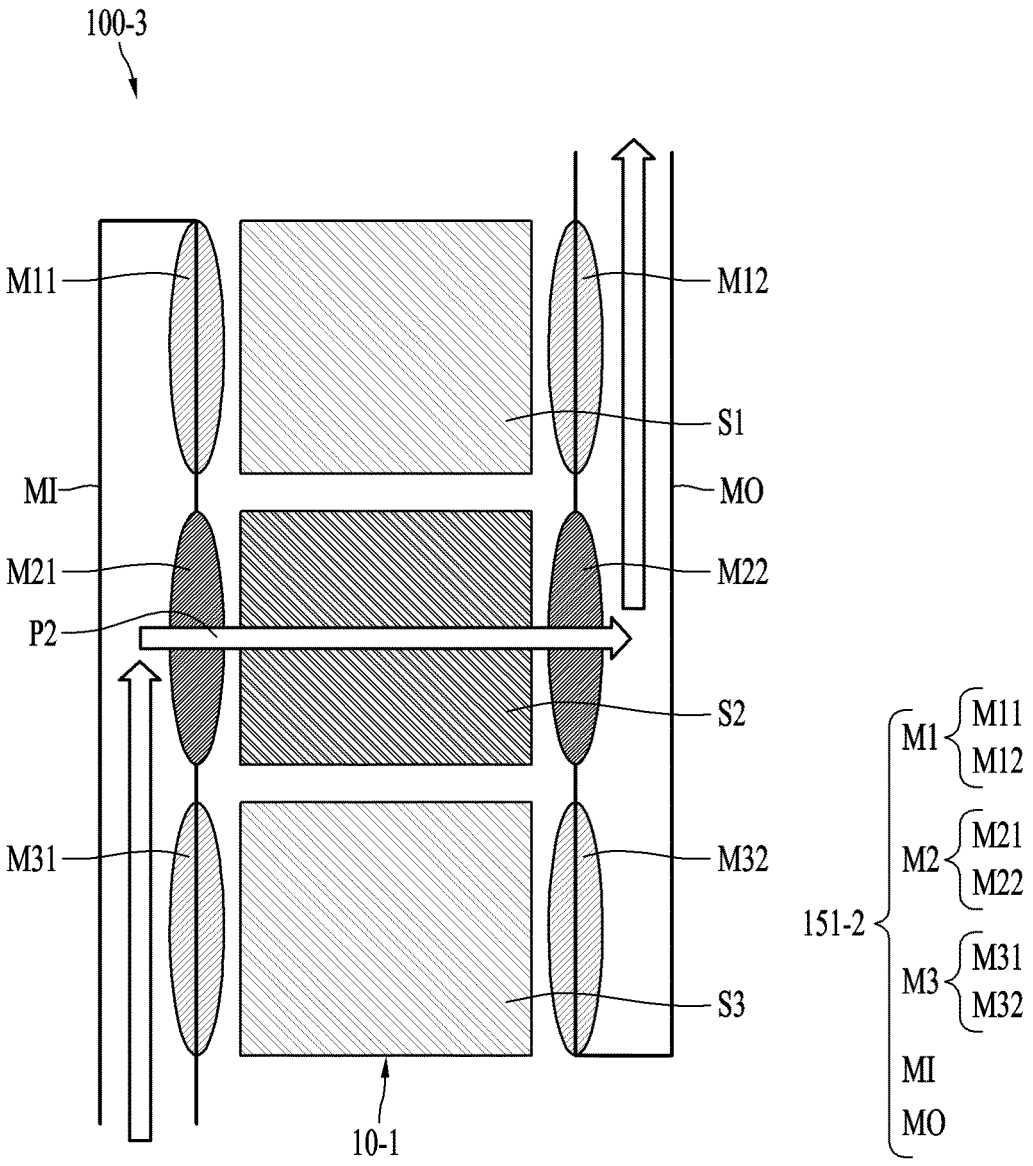
M12
M2
M21
M22
M3
M31
M32
MI
MO

FIG. 14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M21
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P2
S2
M31
M32
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M12
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M21
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M3
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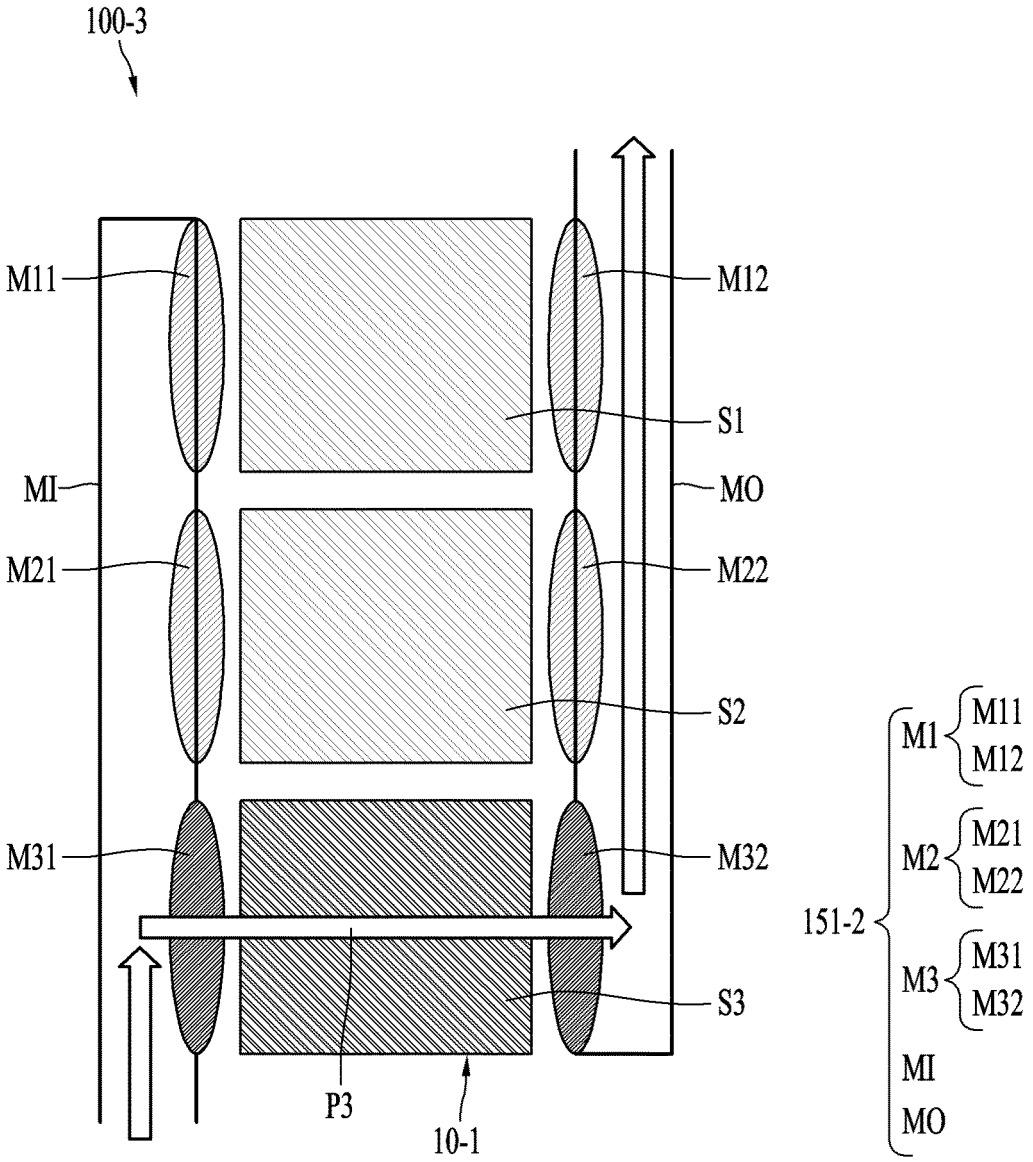
M32
MI
MO

FIG. 15


100-3
M11
M12
S1
MI
MO
M21
M22
S2
M31
M32
S3
P3
10-1
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M1
M11
M12
M2
M21
M22
M3
M31
M32
MI
MO

FIG. 16

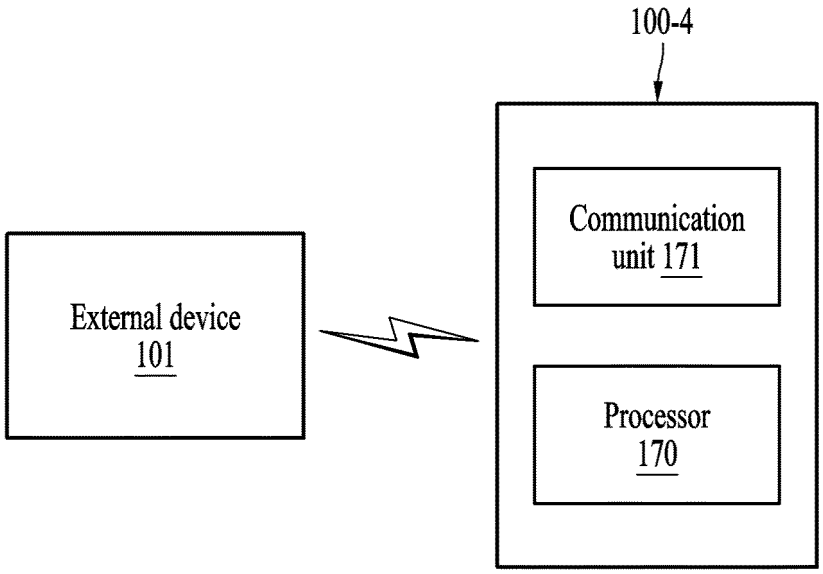
100-4
Communication unit 171
External device 101
Processor 170

FIG. 17

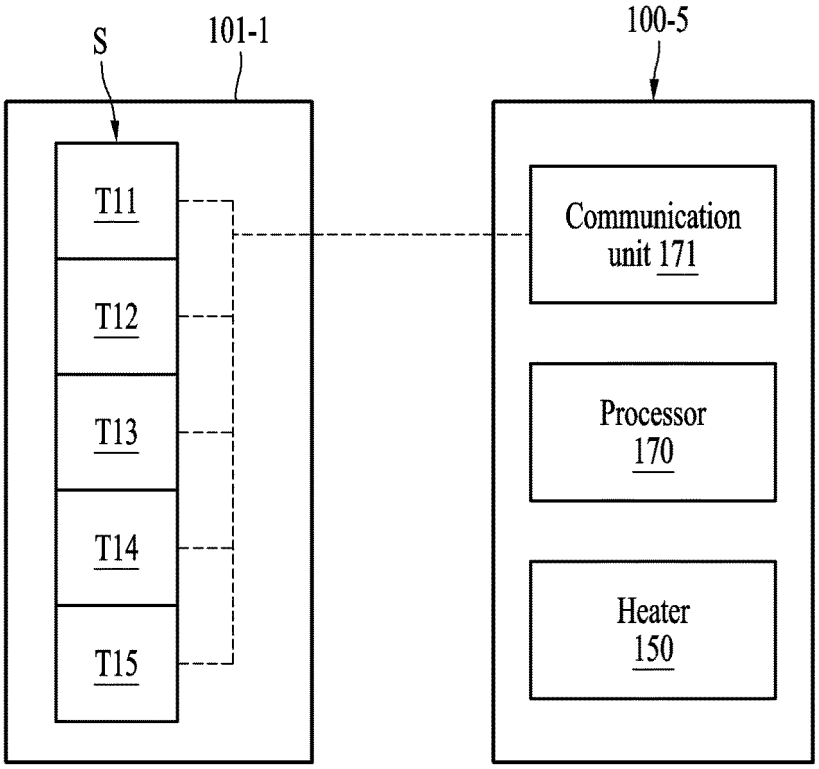
S
101-1
100-5
T11
T12
T13
T14
T15
Communication unit 171
Processor 170
Heater 150

FIG. 18

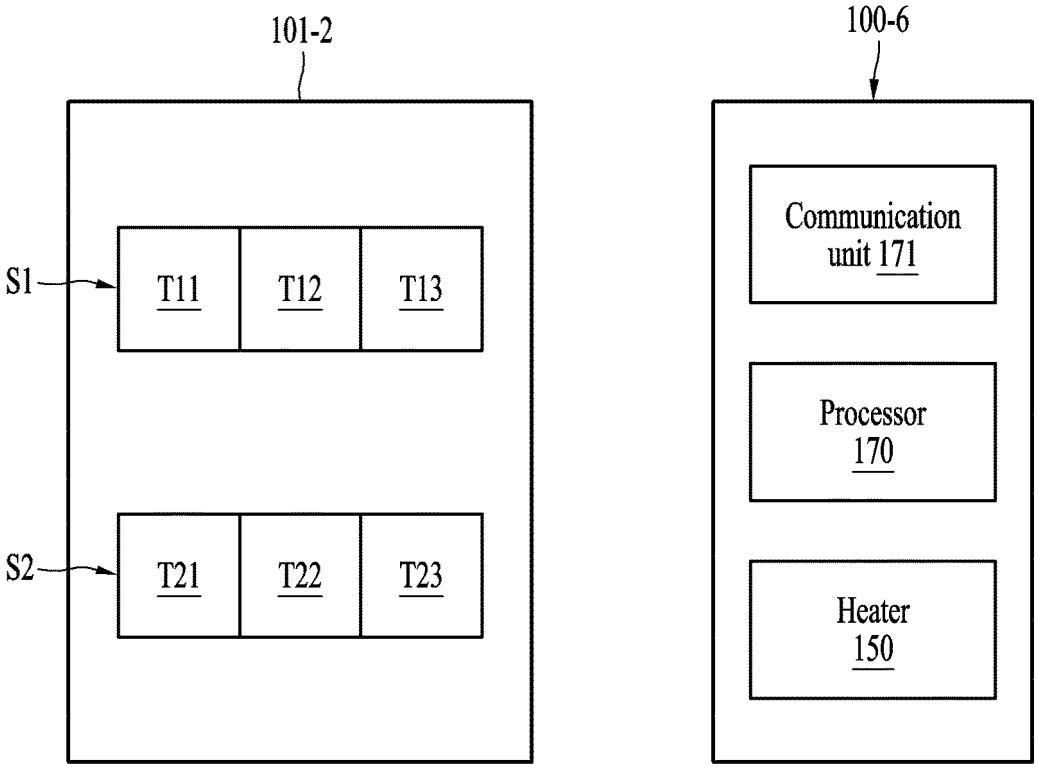
101-2
100-6
S1
T11
T12
T13
S2
T21
T22
T23
Communication unit 171
Processor 170
Heater 150

FIG. 19

INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2023/019865

A. CLASSIFICATION OF SUBJECT MATTER

A24F 40/46(2020.01)i; **A24F 40/485**(2020.01)i; **A24F 40/57**(2020.01)i; **A24F 40/65**(2020.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A24F 40/46(2020.01); A24B 15/16(2006.01); A24B 3/14(2006.01); A24F 40/10(2020.01); A24F 40/30(2020.01); A24F 40/40(2020.01); A24F 40/50(2020.01); A24F 47/00(2006.01)

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: 에어로졸(aerosol), 히터(heater), 세그먼트들(segments), 기류 패스(airflow path) 및 멤브레인(membrane)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	KR 10-2021-0158262 A (KT & G CORPORATION) 30 December 2021 (2021-12-30)	
X	See paragraphs [0019], [0027]-[0036] and [0045]-[0046] and figures 1-3.	11-15
Y		1,2,5-10
A		3,4
	KR 10-2022-0000765 A (KT & G CORPORATION) 04 January 2022 (2022-01-04)	
Y	See paragraphs [0019], [0024] and [0029] and figures 1-4.	1,2,5-10
	KR 10-2021-0081398 A (R. J. REYNOLDS TOBACCO COMPANY) 01 July 2021 (2021-07-01)	
A	See paragraphs [0073]-[0116] and figures 1-3.	1-15
	US 2019-0289909 A1 (RAI STRATEGIC HOLDINGS, INC.) 26 September 2019 (2019-09-26)	
A	See paragraphs [0040]-[0083] and figures 1-6.	1-15

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

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"D" document cited by the applicant in the international application
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
27 June 2024	**01 July 2024**
Name and mailing address of the ISA/KR **Korean Intellectual Property Office** **Government Complex-Daejeon Building 4, 189 Cheongsa-ro, Seo-gu, Daejeon 35208** Facsimile No. **+82-42-481-8578**	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (July 2022)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2023/019865

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	KR 10-2021-0150927 A (KT & G CORPORATION) 13 December 2021 (2021-12-13) See paragraphs [0018]-[0110] and figures 1-5.	1-15

Form PCT/ISA/210 (second sheet) (July 2022)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/KR2023/019865

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
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KR 10-2022-0000765 A	04 January 2022	KR 10-2535307 B1	22 May 2023
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		EP 3873280 A1	08 September 2021
		IL 282751 A	30 June 2021
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		JP 2023-120350 A	29 August 2023
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		WO 2019-186328 A1	03 October 2019
KR 10-2021-0150927 A	13 December 2021	KR 10-20210150928 A	13 December 2021
		KR 10-20210150929 A	13 December 2021
		KR 10-20210150930 A	13 December 2021
		KR 10-20210150931 A	13 December 2021
		KR 10-20210150958 A	13 December 2021
		KR 10-2533744 B1	18 May 2023
		KR 10-2568935 B1	23 August 2023
		KR 10-2570077 B1	25 August 2023
		KR 10-2584558 B1	05 October 2023
		KR 10-2662758 B1	03 May 2024
		KR 10-2670543 B1	31 May 2024

Form PCT/ISA/210 (patent family annex) (July 2022)