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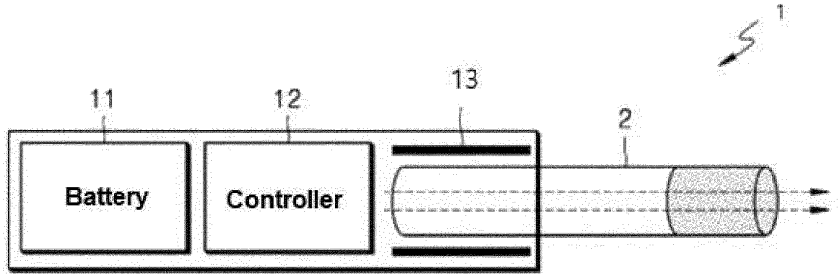
(54) ELECTRONIC SMOKELESS TOBACCO TO WHICH FLAVORING SHEET IS APPLIED

(57) The present invention relates to an aerosol-generating article used together with an aerosol-generating device including a cigarette rod having a cavity segment filled with tobacco granules; and filter rod positioned downstream of the cigarette rod, wherein the cigarette rod includes a flavoring source.

Figure 1



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Description

Technical Field

[0001] The present invention relates to an electronic smokeless cigarette with a flavoring sheet.

Background Art

[0002] In recent years, there is an increasing demand for alternative products that overcome disadvantages of conventional cigarettes. For example, there is an increasing demand for devices (e.g. electronic cigarettes) that generate aerosols by electrically heating cigarette sticks. Accordingly, research on an electrically heated aerosol-generating device and a cigarette stick (or aerosol-generating article) applied thereto is being actively conducted.

[0003] On the other hand, if no visible smoke is generated during smoking, there is an advantage that a user may enjoy smoking regardless of location or environment. Due to such an advantage, smokeless cigarette products such as snuff, snus, and chewing tobacco also have been developed. However, the exemplified smokeless cigarette products have a disadvantage of not providing a smoking feeling like a burning cigarette or a heated cigarette stick.

[0004] On the other hand, in a heated smokeless cigarette, since the amount of aerosol capable of smoothly transferring flavor is insufficient, it is not sufficient to transfer the flavor by a Trans jet nozzle system (TJNS) or a flavor capsule application method, which has been used in the related art. This is because the designed flavor is distorted or a desired level of flavor intensity is not implemented due to the lack of aerosol.

[0005] In particular, in order to provide a customized smoking experience as users' preferences have recently diversified, crushed flavor capsules are put into a filter to provide flavor. These crushed flavor capsules may also provide general flavor or enhanced flavor to the user depending on whether crushed or not by containing a flavoring liquid therein. However, there is a disadvantage that the flavoring liquid is rapidly expressed during crushing to lead to a decrease in flavor expression toward the latter part of smoking, and there is also a disadvantage in that a precise control function for flavor intensity is not provided. In addition, a filter of the TJNS may also be used, but has also a disadvantage in that a precise control function for flavor intensity is not provided.

[0006] (Patent Document 1) Korean Laid-open Patent Publication No. 10-2020-0058086 Disclosure/Technical Problem

[0007] A technical problem to be solved through some embodiments of the present invention is to provide an aerosol-generating device having a smokeless function.

[0008] Another technical problem to be solved through some embodiments of the present invention is to provide an aerosol-generating article which may be used together with an aerosol generation device having a smokeless function.

[0009] Yet another technical problem to be solved through some embodiments of the present invention is to provide an aerosol-generating article capable of imparting rich flavor.

[0010] The technical problems of the present invention are not limited to the aforementioned technical problems, and other problems not mentioned will be clearly understood by those skilled in the art to which the present invention pertains from the following description.

Technical Solution

[0011] According to a first aspect of the present invention,
there is provided an aerosol-generating article used together with an aerosol-generating device including a cigarette rod having a cavity segment filled with tobacco granules; and a filter rod positioned downstream of the cigarette rod, wherein the cigarette rod comprises a flavoring source.

[0012] In an exemplary embodiment of the present invention, the cigarette rod may include a filter segment and a cavity segment, and a flavoring source may be included in at least one of the filter segment and the cavity segment.

[0013] In an exemplary embodiment of the present invention, the filter segment may include a first filter segment and a second filter segment, the first filter segment may be positioned downstream of the cavity segment, the second filter segment may be positioned upstream of the cavity segment, and the cavity segment may be formed by the first filter segment and the second filter segment.

[0014] In an exemplary embodiment of the present invention, the filter rod may include a cooling segment and a mouthpiece segment.

[0015] In an exemplary embodiment of the present invention, the flavoring source may be at least one selected from the group consisting of a flavoring sheet, flavor-containing granules, and a TJNS filter.

[0016] In an exemplary embodiment of the present invention, the cavity segment may include at least one of flavor-containing granules and a flavoring sheet.

[0017] In an exemplary embodiment of the present invention, the filter segment may include at least one of a TJNS filter and a flavoring sheet.

[0018] In an exemplary embodiment of the present invention, the aerosol-generating device may include a heater for heating the cigarette rod from the outside.

[0019] In an exemplary embodiment of the present invention, the aerosol-generating device may include a heater for heating the cavity segment from the outside.

[0020] In an exemplary embodiment of the present invention, the aerosol-generating device may include a heater for heating the cavity segment; and a part of at least one of the first filter segment and the second filter segment adjacent to the cavity segment.

Advantageous Effects

[0021] According to some embodiments of the present invention described above, it is possible to provide an aerosol-generating article suitable for implementing a smokeless function of an aerosol-generating device. Specifically, the provided aerosol-generating article includes a cigarette rod having a cavity filled with tobacco granules, and the tobacco granules contain a significantly less content of moisture and/or aerosol former compared to tobacco materials such as tobacco cut fillers (e.g. leaf tobacco cut fillers, and tobacco sheet cut fillers), tobacco sheets, etc., thereby greatly reducing the generation of visible smoke. In addition, since the tobacco granules exhibit sufficient smoking flavor even at a relatively low temperature compared to other types of tobacco materials, the heating temperature of the aerosol-generating device may be set relatively low, thereby further reducing the generation of visible smoke.

[0022] In addition, as a flavoring sheet, granules containing flavor, or a TJNS filter is included in a cavity part or a filter segment and heated, there is an advantage that flavor intensity and flavor persistence are remarkably increased, and odor is reduced.

[0023] In addition, as the smokeless function is provided, the user can use the aerosol-generating device regardless of location or environment. Accordingly, user convenience may be improved.

[0024] In addition, a cavity segment may be formed by filter segments located upstream and downstream of the cigarette rod, and tobacco granules may be filled in the cavity segment. Accordingly, the cigarette rod capable of minimizing a falling-off phenomenon of the tobacco granules may be easily manufactured.

[0025] Further, the filter segment forming the cavity segment of the cigarette rod may consist of a paper filter. In this case, it is possible to prevent a problem of changing the physical properties of the filter segment by heating of the heater.

[0026] In addition, the cigarette rod may be designed so that a vortex flow occurs inside the cavity segment when puffing. In this case, since the tobacco granules are heated while being well mixed by the generated vortex flow, a plurality of tobacco granules may be uniformly heated, and the smoking flavor may be further improved.

[0027] The effects of the present invention are not limited to the aforementioned effect, and other effects, which are not mentioned above, will be apparent to a person having ordinary skill in the art from the following disclosure.

Description of Drawings

[0028]

FIG. 1 is an exemplary diagram schematically illustrating an aerosol-generating device according to an embodiment of the present invention.

FIG. 2 is an exemplary diagram schematically illustrating an aerosol-generating article according to an embodiment of the present invention.

FIG. 3 is an exemplary diagram schematically illustrating an aerosol-generating article according to another embodiment of the present invention.

FIG. 4 is an exemplary diagram for describing a heating structure of a heater according to an embodiment of the present invention.

FIG. 5 is an exemplary diagram for describing a heating structure of a heater according to another embodiment of the present invention.

FIG. 6 is an exemplary diagram for describing various adding methods of a flavoring sheet according to an embodiment of the present invention.

FIG. 7 is an exemplary diagram for describing various processing forms of a flavoring sheet according to an embodiment of the present invention.

Best Mode

[0029] Terms and words used in the present specification and claims should not be interpreted as being limited to typical or dictionary meanings, but should be interpreted as meanings and concepts which comply with the technical spirit of the present invention, based on the principle that the present inventor can appropriately define the concepts of

the terms to describe his/her own invention in the best manner. Therefore, the embodiments described in the present specification and the configurations illustrated in the drawings are merely the most preferred embodiment of the present invention and are not intended to represent all of the technical ideas of the present invention, and thus, it should be understood that various equivalents and modifications capable of replacing the embodiments at the time of this application.

[0030] When reference numerals refer to components of each drawing, it is to be noted that although like components are illustrated in different drawings, like components are denoted by the same reference numerals as possible. In the following description, a detailed explanation of related known configurations or functions may be omitted to avoid obscuring the subject matter of the present invention.

[0031] Unless otherwise defined, all terms (including technical and scientific terms) used in the present specification may be used as the meaning which may be commonly understood by the person with ordinary skill in the art, to which the present invention pertains. Terms defined in commonly used dictionaries should not be interpreted in an idealized or excessive sense unless expressly and specifically defined. It is also to be understood that the terminology used in this specification is for the purpose of describing embodiments only and is not intended to limit the present invention. In this specification, singular forms include even plural forms unless the context indicates otherwise.

[0032] In addition, in describing the components of the embodiments of the present invention, terms such as first, second, A, B, (a), (b), and the like may be used. These terms are only intended to distinguish the components from other components, and the nature, sequence, or order of the components is not limited by the terms. When a component is described as being "connected", "coupled", or "linked" to other components, it should be understood that the component may be directly connected or linked to the other component, but another component may be "connected", "coupled", or "linked" between the respective components.

[0033] The terms "comprises" and/or "comprising" used in the specification for stated component, step, operation, and/or element do not preclude the presence or addition of one or more other components, steps, operations, and/or elements.

[0034] Prior to the description of various embodiments according to the present invention, some terms used in the following embodiments will be clarified.

[0035] In embodiments according to the present invention, an "aerosol former" may refer to a material capable of facilitating the formation of visible smoke and/or aerosol. Examples of the aerosol former may include glycerin, propylene glycol, ethylene glycol, dipropylene glycol, diethylene glycol, triethylene glycol, tetraethylene glycol, and oleyl alcohol, but are not limited thereto. In the art, the aerosol former may be used interchangeably with terms such as a moisturizer, a wetting agent, and the like.

[0036] In embodiments according to the present invention, an "aerosol-forming substrate" may mean a material capable of forming aerosol. The aerosol may contain a volatile compound. The aerosol-forming substrate may be solid or liquid.

[0037] For example, the solid aerosol-forming substrate may comprise a solid material based on cigarette raw materials such as tobacco sheets, tobacco cut fillers, reconstituted tobaccos, etc., and the liquid aerosol-forming substrate may comprise a liquid composition based on nicotine, tobacco extracts and/or various flavoring agents. However, the scope of the present invention is not limited to these examples. The aerosol-forming substrate may further comprise an aerosol former to stably form visible smoke and/or aerosol.

[0038] In embodiments according to the present invention, the "aerosol-generating device" may refer to a device that generates aerosol using an aerosol-forming substrate to generate aerosol that can be directly inhaled into the user's lungs through the user's mouth. Examples of the aerosol-generating device will be described with reference to FIG. 1.

[0039] In embodiments according to the present invention, an "aerosol-generating article" may refer to an article capable of generating aerosol. The aerosol-generating article may comprise an aerosol-forming substrate. A representative example of the aerosol-generating article may be a cigarette, but the scope of the present invention is not limited thereto.

[0040] In embodiments according to the present invention, "upstream" or "upstream direction" means a direction far away from the user's (smoker's) oral region, and "downstream" or "downstream direction" means a direction close to the user's oral region. The terms of upstream and downstream may be used to describe relative positions of elements constituting the aerosol-generating article. For example, in an aerosol-generating article 2 illustrated in FIG. 2, a cigarette rod 21 is positioned upstream or in an upstream direction of a filter rod 22, and the filter rod 22 is positioned downstream or in a downstream direction of the cigarette rod 21.

[0041] In embodiments according to the present invention, "puff" means inhalation of the user, and the inhalation may mean a situation of being drawn into the user's mouth, nasal cavity, or lungs through the user's mouth or nose.

[0042] In embodiments according to the present invention, a "longitudinal direction" may mean a direction corresponding to a longitudinal axis of the aerosol-generating article.

[0043] In embodiments according to the present invention, a "sheet" may mean a thin layer element having width and length substantially greater than its thickness. In the art, the term of sheet may also be used interchangeably with terms such as a web and a film.

[0044] In embodiments according to the present invention, a "flavor sheet or flavoring sheet" may mean a material

containing a flavoring agent or flavoring and manufactured in the form of a sheet.

[0045] Hereinafter, various embodiments of the present invention will be described in detail with reference to the accompanying drawings.

[0046] FIG. 1 is an exemplary diagram for describing an aerosol-generating device 1 according to some embodiments of the present invention. In particular, the drawings below FIG. 1 illustrate an example of a state in which the aerosol-generating article 2 is inserted (received).

[0047] As illustrated in FIG. 1, the aerosol-generating device 1 according to the embodiment of the present invention may include a housing, a heater 13, a battery 11, and a controller 12. However, only the components related to the embodiment of the present invention are illustrated in FIG. 1. Accordingly, those of ordinary skill in the art to which the present invention pertains can see that other general-purpose components other than components illustrated in FIG. 1 may be further included. For example, the aerosol-generating device 1 may further include an input module (e.g. a button, a touchable display, etc.) for receiving commands and the like from a user and an output module (e.g. an LED, a display, a vibration motor, etc.) for outputting information such as a device status, smoking information, etc. Hereinafter, each component of the aerosol-generating device 1 will be described.

[0048] The housing according to the embodiment of the present invention may form an appearance of the aerosol-generating device 1. In addition, the housing may form a receiving space for receiving the aerosol-generating article 2. It may be preferable that the housing is formed of a material capable of protecting internal components.

[0049] Next, the heater 13 according to the embodiment of the present invention may heat the aerosol-generating article 2 received in the receiving space. Specifically, when the aerosol-generating article 2 is received in the receiving space of the aerosol-generating device 1, the heater 13 may heat the aerosol-generating article 2 by electric power supplied from the battery 11.

[0050] The heater 13 may be configured in various shapes and/or types.

[0051] For example, the heater 13 may be configured to include an electrically resistive heating element. In other words, the heater 13 includes an electrically insulating substrate (e.g. a substrate formed of polyimide) and an electrically conductive track, and may include a heating element that generates heat as a current flows in the electrically conductive track. However, the scope of the present invention is not limited to the above-described examples, and the heating element may be applied without limitation as long as it can be heated to a desired temperature. Here, the desired temperature may be preset in the aerosol-generating device 1 (e.g. when a temperature profile is stored in advance), or may also be set to a desired temperature by the user.

[0052] As another example, the heater 13 may be configured to include a heating element for operating in an inductive heating method. Specifically, the heater 13 may include an inductor (e.g. an inductive coil) for heating the aerosol-generating article 2 in an inductive heating method and a susceptor inductively heated by the inductor. The susceptor may be positioned inside or outside the aerosol-generating article 2.

[0053] In addition, for example, the heater 13 may include a heating element (hereinafter briefly referred to as "internal heating element") for internally heating the aerosol-generating article 2, a heating element (hereinafter briefly referred to as an "external heating element") for externally heating the aerosol-generating article 2, or a combination thereof. The internal heating element may be formed in a shape such as a tubular shape, a needle shape, or a rod shape and disposed to penetrate through at least a portion of the aerosol-generating article 2, and the external heating element may be formed in a shape such as a plate shape, a cylindrical shape, or the like and disposed to surround at least a portion of the aerosol-generating article 2. However, the scope of the present invention is not limited thereto, and the shape, number, arrangement, etc. of the heating element may be designed in various ways. In order to exclude the duplicated description, a more detailed description of the heating structure of the heater 13 will be described below with reference to FIGS. 4 to 5.

[0054] Next, the battery 11 may supply power used to operate the aerosol-generating device 1. For example, the battery 11 may supply power so that the heater 13 may heat the aerosol-generating article 2, and may supply power required for operating the controller 12.

[0055] In addition, the battery 11 may supply power required to operate electrical components such as a display (not illustrated), a sensor (not illustrated), a motor (not illustrated), and the like installed in the aerosol-generating device 1.

[0056] Next, the controller 12 may control the overall operation of the aerosol-generating device 1. For example, the controller 12 may control the operation of the heater 13 and the battery 11, and may also control the operation of other components included in the aerosol-generating device 1. The controller 12 may control the power supplied by the battery 11, the heating temperature of the heater 13, and the like. In addition, the controller 12 may determine whether the aerosol-generating device 1 is in an operable state by checking a state of each of the components of the aerosol-generating device 1.

[0057] The controller 12 may be implemented by at least one processor. The processor may be implemented as an array of a plurality of logic gates, or may also be implemented as a combination of a general-purpose micro processor and a memory in which a program executable in the micro processor is stored. In addition, those of ordinary skill in the art to which the present invention pertains can clearly understand that the controller 12 may be implemented with other

types of hardware.

[0058] The aerosol-generating article 2 may have a structure similar to that of a general combustion-type cigarette. For example, the aerosol-generating article 2 may be divided into a first part (e.g. cigarette rod) including a tobacco material (or an aerosol-forming substrate) and a second part (e.g. filter rod) including a filter or the like. The entire first part may be inserted into the aerosol-generating device 1, and the second part may be exposed to the outside. Alternatively, only a part of the first part may be inserted into the aerosol-generating device 1, and the entire first part and a part of the second part may also be inserted into the aerosol-generating device 1. The user may smoke while biting the second part by the mouth.

[0059] The aerosol-generating article 2 according to the embodiment of the present invention may be an article filled with tobacco granules, and the present embodiment will be described below in detail with reference to the drawings below FIG. 2.

[0060] In addition, the aerosol-generating device 1 according to the embodiment of the present invention may include a smokeless function (i.e. a function in which visible smoke is not generated during use or a function in which the generation of visible smoke is minimized). In addition, the aerosol-generating article 2 may be designed to implement a smokeless function. Specifically, the aerosol-generating article 2 is an article filled with tobacco granules, and the aerosol-generating device 1 may operate to heat the aerosol-generating article 2 at a heating temperature of about 270°C or less. In this case, the visible smoke is not generated or the generation of visible smoke may be minimized during smoking, which is because tobacco granules contain a significantly less content of moisture and/or aerosol former rather than tobacco materials such as tobacco cut fillers (e.g. leaf tobacco cut fillers, tobacco sheet cut fillers) and tobacco sheets to reduce the generation of visible smoke. In addition, the tobacco granules may exhibit sufficient smoking flavor even at a lower heating temperature (e.g. the heating temperature of tobacco cut fillers is usually 270°C or higher) than tobacco materials such as tobacco cut fillers and tobacco sheets (that is, nicotine may be sufficiently exhibited) to reduce the heating temperature of the heater 13. This is because the generation of visible smoke may be further reduced as the heating temperature is lowered. According to the present embodiment, as the smokeless function is provided, the user may use the aerosol-generating device regardless of location or environment, so that the user's convenience may be greatly improved. The present embodiment will be described in more detail along with the structure of the aerosol-generating article 2 with reference to the drawings below FIG. 6.

[0061] FIG. 1 is a diagram for describing the aerosol-generating device 1 according to some other embodiments of the present invention.

[0062] The aerosol-generating article 2 according to an embodiment of the present invention may have a smokeless function. The smokeless mode may mean a mode in which aerosol is generated by the aerosol-generating device 1, but visible smoke is not generated (or a mode in which generation of visible smoke is minimized). In order to implement the smokeless mode, the controller 12 may operate the heater 13.

[0063] So far, the aerosol-generating device 1 according to some embodiments of the present invention has been described with reference to FIG. 1. Hereinafter, the aerosol-generating article 2 according to some embodiments of the present invention will be described with reference to the drawings below FIG. 2.

[0064] FIG. 2 is an exemplary diagram schematically illustrating the aerosol-generating article 2 according to some embodiments of the present invention.

[0065] As illustrated in FIG. 2, the aerosol-generating article 2 may include a filter rod 22 and a cigarette rod 21 having a cavity formed therein. However, only the components related to the embodiment of the present invention are illustrated in FIG. 2. Accordingly, those skilled in the art to which the present invention pertains can understand that other general-purpose components other than components illustrated in FIG. 6 may be further included. Hereinafter, each component of the aerosol-generating article 2 will be described.

[0066] The filter rod 22 may be positioned downstream of the cigarette rod 21 to perform a filtering function for the aerosol. To this end, the filter rod 22 may comprise a filter material such as paper, cellulose acetate fibers, or the like. The filter rod 22 may further include a wrapper for wrapping the filter material.

[0067] The filter rod 22 may be manufactured in various shapes. For example, the filter rod 22 may be a cylindrical type rod, or a tubular type rod including a hollow therein. Also, the filter rod 22 may also be a recess-type rod. If the filter rod 22 consists of a plurality of segments, at least one of the plurality of segments may also be manufactured in a different shape.

[0068] The filter rod 22 may be manufactured to generate flavor. As an example, a flavoring solution may be sprayed onto the filter rod 22, and a separate fiber coated with the flavoring solution may also be inserted into the filter rod 22. As another example, the filter rod 22 may include at least one capsule (not illustrated) containing the flavoring solution.

[0069] FIG. 2 illustrates an example in which the filter rod 22 is formed of a single segment, but the scope of the present invention is not limited thereto, and the filter rod 22 may also be formed of a plurality of segments. For example, as illustrated in FIG. 3, the filter rod 22 may consist of a cooling segment 222 that performs a cooling function on the aerosol and a mouthpiece segment 221 that performs a filtering function on the aerosol. Alternatively, in some cases, the filter rod 22 may further include at least one segment that performs another function.

[0070] For reference, the cooling segment 222 may be manufactured in various shapes. For example, the cooling segment 222 may be manufactured in the form of a paper joining tube, a hollow cellulose acetate filter, a cellulose acetate filter with a plurality of holes, a filter filled with a polymer material or a biodegradable polymer material, or the like. However, the present invention is not limited thereto, and so long as performing the function of cooling the aerosol, the cooling segment 222 may be manufactured in any shape. The polymer material or the biodegradable polymer material may be a polylactic acid (PLA)-made woven fabric, but is not limited thereto.

[0071] In addition, the mouthpiece segment 221 may be, for example, a cellulose acetate filter (i.e. a filter made of cellulose acetate fibers), but is not limited thereto. The description of the filter rod 22 described above may also be applied to the mouthpiece segment 221.

[0072] It will be described with reference to FIG. 2 again.

[0073] The cigarette rod 21 is a cigarette rod including the cavity or the cavity segment 212 and may supply a tobacco component (or a smoking flavor component) such as nicotine as the cigarette rod is heated. As illustrated in FIG. 2, the cigarette rod 21 may include a first filter segment 211, a second filter segment 213, and a cavity segment 212 formed by the first filter segment 211 and the second filter segment 213. In addition, the cavity segment 212 may be filled with tobacco granules 214 (that is, granular tobacco material). The cigarette rod 21 may further include a wrapper that wraps the rod.

[0074] The first filter segment 211 is a filter segment forming the cavity segment 212 and may be positioned downstream of the cavity segment 212. The first filter segment 211 may further perform filtration and cooling functions for the aerosol in addition to a cavity forming function.

[0075] In some embodiments, the first filter segment 211 may comprise a paper material. In other words, the first filter segment 211 may comprise a paper filter. In order to secure a smooth airflow path, the paper material may be preferably arranged in the longitudinal direction. However, the present invention is not limited thereto. According to the embodiment, the cigarette rod 21 suitable for a heated aerosol-generating device 1 may be manufactured. Specifically, since the cellulose acetate fibers are melted or contracted when heated to a certain temperature or higher, it is difficult to be applied to the cigarette rod part heated by the heater 13. On the other hand, since the paper material is hardly denatured by heat, the paper material may be easily applied to the cigarette rod part, so that the cigarette rod 21 suitable for the heated aerosol-generating device 1 may be manufactured. However, in some other embodiments, the first filter segment 211 may be formed of a cellulose acetate filter. In this case, the effect of improving the removability of the first filter segment 211 may be achieved.

[0076] In addition, in some embodiments, the first filter segment 211 may comprise a water-resistant or oil-resistant paper material. In this case, it is possible to greatly reduce a problem that a smoke component (e.g. moisture, aerosol former component) contained in the aerosol is absorbed while passing through the first filter segment 211 to reduce the visible atomization amount. For example, when the first filter segment 211 comprises a general paper material, the above-described smoke component may be absorbed due to the water absorption of the paper material to reduce the visible atomization amount. However, when the water-resistant or oil-resistant paper material is applied, the absorption of the smoke component hardly occurs, so that the problem of reducing the atomization amount may be solved.

[0077] In addition, in some embodiments, the suction resistance of the first filter segment 211 may be about 50 mmH_2O/60mm to 150 mmH_2O/60mm, preferably about 50 mmH_2O/60mm to 130 mmH_2O/60mm, about 50 mmH_2O/60mm to 120 mmH_2O/60mm, about 50 mmH_2O/60mm to 110 mmH_2O/60mm or about 50 mmH_2O/60mm to 100 mmH_2O/60mm. Within the numerical range, adequate suckability may be ensured. In addition, a probability of occurrence of a vortex flow in the cavity segment 212 is increased by proper suckability, thereby achieving an effect of uniformly heating the plurality of tobacco granules 214.

[0078] Next, the second filter segment 213 is a filter segment forming the cavity segment 212 and may be positioned upstream of the cavity segment 212. The second filter segment 213 may further perform a falling-off prevention function for the tobacco granules 214. In addition, the second filter segment 213 may allow the cavity segment 212 to be disposed in an appropriate position within the aerosol-generating device 1 when the aerosol-generating article 2 is inserted into the aerosol-generating device 1. In addition, the second filter segment 213 may prevent the cigarette rod 21 from being separated to the outside, and may prevent the aerosol liquefied from the cigarette rod 21 during smoking from flowing into the aerosol-generating device 1.

[0079] In some embodiments, the second filter segment 213 may comprise a paper material. In other words, the second filter segment 213 may consist of a paper filter. In order to secure a smooth airflow path, the paper material may be preferably arranged in the longitudinal direction. However, the present invention is not limited thereto. According to this embodiment, the cigarette rod 21 suitable for the heated aerosol-generating device 1 may be manufactured. Specifically, the cellulose acetate fibers are melted or contracted when being in contact with the internal heating element, thereby accelerating the falling-off phenomenon of the tobacco granules 214. However, heat-resistant paper materials may greatly alleviate this phenomenon.

[0080] Next, the cavity segment 212 as a segment having a cavity may be positioned between the first filter segment 211 and the second filter segment 213. That is, the cavity segment 212 may be formed by the filter segment 211 and

the second filter segment 213.

[0081] The cavity segment 212 may be manufactured in various methods. As an example, the cavity segment 212 may be manufactured to include a tubular structure such as a paper joining tube. As another example, the cavity segment 212 may also be manufactured by wrapping the cavity formed by the two filter segments 211 and 213 with a wrapper made of a suitable material. However, the scope of the present invention is not limited thereto, and as long as the tobacco granules 214 may be filled, the cavity segment 212 may be manufactured in any manner.

[0082] The length of the cavity segment 212 may be freely selected within about 8 mm to 12 mm, but the scope of the present invention is not limited to the numerical range.

[0083] As illustrated in the drawing, the cavity segment 212 may be filled with the tobacco granules 214. Since the tobacco granules 214 may exhibit sufficient smoking flavor even at a lower heating temperature than other types of tobacco materials (e.g. leaf tobacco cut fillers, tobacco sheets, etc.), power consumption of the heater 13 may be reduced. In addition, the tobacco granules 214 may be a tobacco material suitable for implementing a smokeless function of the aerosol-generating device 1 by easily reducing the content of the moisture and/or aerosol former compared with other types of tobacco materials (e.g. leaf tobacco cut fillers, tobacco sheets, etc.) (that is, by easily manufacturing the tobacco granules with less moisture content or less aerosol former content).

[0084] The diameter, density, filling rate, composition ratio of constituent materials, heating temperature, etc. of the tobacco granules 214 may vary, which may vary depending on the embodiment.

[0085] In some embodiments, the diameter of the tobacco granules 214 may be about 0.3 mm and 1.2 mm. Within this numerical range, proper hardness and manufacturing easiness of the tobacco granules 214 are ensured, and the probability of occurrence of the vortex flow in the cavity segment 212 may be increased.

[0086] In addition, in some embodiments, the density of the tobacco granules 214 may be 0.5 g/cm^3 to 1.2 g/cm^3. Within this numerical range, the proper hardness of the tobacco granules 214 is ensured, and the probability of occurrence of the vortex flow in the cavity segment 212 may be increased.

[0087] In addition, in some embodiments, the filling ratio of the tobacco granules 214 to the cavity segment 212 may be about 80 vol% or less, preferably about 70 vol%, 60 vol%, or 50 vol% or less. Within the numerical range, the probability of occurrence of the vortex flow in the cavity segment 212 may be increased. In addition, the filling rate of the tobacco granules 214 may be preferably about 20 vol%, 30 vol%, or 40 vol% or more to ensure appropriate smoking flavor.

[0088] Further, in some embodiments, the tobacco granules 214 may comprise about 20 wt% or less of moisture, preferably about 15 wt%, 12 wt%, 10 wt%, 7 wt%, or 5 wt% or less of moisture. Within the numerical range, the generation of visible smoke may be greatly reduced, and the smokeless function of the aerosol-generating device 1 may be easily implemented. However, in some other embodiments, the tobacco granules 214 may also comprise about 20 wt% or more of moisture.

[0089] Further, in some embodiments, the tobacco granules 214 may comprise about 10 wt% or less of an aerosol former, preferably about 7 wt%, 5 wt%, 3 wt%, or 1 wt% of the aerosol former. Alternatively, the tobacco granules 214 may not comprise the aerosol former. Within the numerical range, the generation of visible smoke may be greatly reduced, and the smokeless function of the aerosol-generating device 1 may be easily implemented. However, in some other embodiments, the tobacco granules 214 may also comprise about 10 wt% or more of the aerosol former.

[0090] In addition, in some embodiments, the heating temperature of the tobacco granules 214 may be about 270°C, 260°C, 250°C, 240°C, or 230°C or less. In other words, the heater 13 may heat the cigarette rod 21 at a heating temperature in the exemplified range. Within the numerical range, it is possible to solve a problem that the tobacco granules 214 are overheated to develop a burnt taste. In addition, the smokeless function of the aerosol-generating device 1 may be easily implemented by minimizing the generation of visible smoke while securing proper smoking flavor. In detail, the tobacco material such as tobacco cut fillers and tobacco sheets needs to be heated at about 270°C or higher to exhibit sufficient smoking flavor, whereas the tobacco granules 214 may exhibit sufficient smoking flavor even at lower temperatures, thereby reducing power consumption of the heater 13 and easily inhibiting the generation of visible smoke. In addition, due to these properties, the tobacco granules 214 may be suitable for implementing the smokeless function of the aerosol-generating device 1 compared to other types of tobacco materials.

[0091] On the other hand, although not clearly illustrated, the aerosol-generating article 2 may be wrapped by at least one wrapper. As an example, the aerosol-generating article 2 may be wrapped by one wrapper. As another example, the aerosol-generating article 2 may also be superimposedly wrapped by two or more wrappers. For example, the cigarette rod 21 may be wrapped by a first wrapper, and the filter rod 22 may be wrapped by a second wrapper. Then, the cigarette rod 21 and the filter rod 22 wrapped by individual wrappers are combined to each other, and the entire aerosol-generating article 2 may be re-wrapped by a third wrapper. If each of the cigarette rod 21 and the filter rod 22 consists of a plurality of segments, each segment may be wrapped by an individual wrapper. In addition, the entire aerosol-generating article 2 to which the segments wrapped by individual wrappers are combined may be re-wrapped by another wrapper. At least one hole through which external air flows in or internal gas flows out may also be formed in the wrapper.

[0092] So far, the aerosol-generating article 2 according to some embodiments of the present invention has been

described with reference to FIGS. 2 and 3. As described above, an aerosol-generating article 2 filled with the tobacco granules 214 may be provided. Such an aerosol-generating article 2 may give a user smoking feeling and intimacy better than a cartridge-type product (i.e. a cartridge product filled with tobacco granules) and may also reduce manufacturing cost.

[0093] Furthermore, the aerosol-generating article 2 may be provided with an aerosol-generating article 2 suitable for implementing the smokeless function of the aerosol-generating device 1. Specifically, the aerosol-generating article 2 includes the cigarette rod 21 filled with the tobacco granules 214, but the tobacco granules 214 have a significantly less moisture and/or aerosol former content compared to tobacco materials such as tobacco cut fillers (e.g. leaf tobacco cut fillers, tobacco sheet cut fillers), tobacco sheets, etc., thereby greatly reducing the generation of visible smoke. In addition, since the tobacco granules 214 exhibit sufficient smoking flavor even at a relatively low temperature compared to other types of tobacco materials, the heating temperature of the aerosol-generating device 1 may be set relatively low, and the generation of visible smoke may be further reduced as the heating temperature is lowered.

[0094] In addition, the cavity segment 212 may be formed by the filter segments 211 and 213 positioned upstream and downstream of the cigarette rod 21, and the tobacco granules 214 may be filled in the cavity segment 212. Accordingly, the cigarette rod 21 capable of minimizing the falling-off phenomenon of the tobacco granules 214 may be easily manufactured.

[0095] In addition, the filter segments 211 and 213 may also be formed of paper filters. In this case, it is possible to prevent a problem of changing the physical properties of the filter segments 211 and 213 by heating of the heater 13.

[0096] On the other hand, the inventors of the present invention have confirmed that when the cigarette rod is manufactured to contain a flavoring source, as the cigarette rod is heated, flavor intensity and flavor persistence are remarkably increased, and odor is reduced.

[0097] FIG. 2 is an exemplary diagram for describing the content in which the cavity segment and the filter segment are formed in the aerosol-generating article 2 according to some embodiments of the present invention. For convenience of understanding, the drawings below in FIG. 2 illustrate only the cigarette rod 21 excluding the filter rod 22.

[0098] As illustrated in FIG. 2, the cigarette rod 21 may include a flavoring source. Although not separately indicated in the drawings, the flavoring source may be at least one selected from the group consisting of a flavoring sheet, flavor-containing granules, and a TJNS filter.

[0099] The flavoring sheet according to some embodiments of the present invention may be processed and used in various forms, such as a cut-out form, a rolling or folding form, and the like. The flavoring sheet may gradually release a flavoring fixed therein as the flavoring sheet is heated, thereby significantly improving flavor persistence.

[0100] The flavor-containing granules according to some embodiments of the present invention are not particularly limited as long as the granules contain flavor, and for example, may use extruded granules containing menthol, etc., but the present invention is not limited thereto.

[0101] The TJNS filter according to some embodiments of the present invention is not particularly limited as long as it is a spray method (TJNS) by a nozzle, etc. For example, the TJNS filter may use a mono-cellulose filter, a tube filter, etc. in which a flavor component is sprayed, but is not limited thereto.

[0102] In the aerosol-generating article 2 according to some embodiments of the present invention, the cigarette rod includes the filter segments 211 and 213 and the cavity segment 212, and a flavoring source may be included in at least one of the filter segments and the cavity segment. As the flavoring source is included in at least one of the filter segments and the cavity segment in the aerosol-generating article 2 according to some embodiments of the present invention, it is possible to increase the transfer of the flavor contained in the flavoring source by heating the cigarette rod from the outside by a heater to be described below.

[0103] Specifically, the filter segment includes a first filter segment 213 and a second filter segment 211, wherein the first filter segment 213 is positioned downstream of the cavity segment 212, the second filter segment 211 is positioned upstream of the cavity segment 212, and the cavity segment 212 may be formed by the first filter segment 213 and the second filter segment 211. At this time, at least one flavoring source selected from the group consisting of a flavoring sheet, flavor-containing granules, and a TJNS filter may be included in at least one selected from the group consisting of the first filter segment 213, the second filter segment 211, and the cavity segment 212.

[0104] In the aerosol-generating article 2 according to some embodiments of the present invention, the cavity segment 212 may include at least one of flavor-containing granules and a flavoring sheet.

[0105] In the aerosol-generating article 2 according to some embodiments of the present invention, at least one of a TJNS filter and a flavoring sheet may be included in the first filter segment 213 or the second filter segment 211.

[0106] So far, how the flavoring source included in the aerosol-generating article is included in the aerosol-generating article has been described with reference to FIG. 2. Hereinafter, a heating structure of the heater 13 according to some embodiments of the present invention will be described with reference to FIGS. 4 and 5.

[0107] First, a heating structure of the heater 13 according to the embodiment of the present invention will be described with reference to FIG. 4.

[0108] As illustrated in FIG. 4, the heater 13 according to the present embodiment may be configured to include an

external heating element 131, and the external heating element 131 may be disposed to heat only the cavity segment 212. For example, the external heating element 131 may be disposed to surround at least a portion of the cavity segment 212. In this case, only the flavoring source included in the cavity segment 212 may be heated by the heat of the heater 13 to provide special flavor.

[0109] In addition, as illustrated in FIG. 5, the heater 13 according to the present embodiment may be configured to include the external heating element 131, and the external heating element 131 may be disposed to heat the cavity segment 212; and a part of at least one of the first filter segment 213 and the second filter segment 211 adjacent to the cavity segment 212. For example, the external heating element 131 may be disposed to surround the cavity segment 212 and at least a part of the filter segment. In this case, in addition to the cavity segment 212, the first filter segment 213 or the second filter segment 211 adjacent thereto may be heated, so that the flavoring source included in the filter segments 211 and 213 is heated by the heater 13 to provide flavor.

[0110] In addition, in a heating structure of the heater 13 of another embodiment according to the present invention, the heater 13 may heat the cavity segment 212 by an induction heating method through a particulate susceptor material (hereinafter, referred to as "susceptor particles"). Specifically, the heater 13 may be configured to include an inductor (e.g. an induction coil) for inductively heating the susceptor material, and a plurality of susceptor particles may be disposed inside the cavity segment 212. In this case, while the plurality of susceptor particles is mixed with the tobacco granules 214 inside the cavity segment 212, the tobacco granules 214 are heated, so that the tobacco granules 214 may be uniformly heated.

[0111] The method of disposing the susceptor particles may vary. For example, the susceptor particles may be filled into the cavity segment 212 in addition to the tobacco granules 214. As another example, the susceptor particles may also constitute some of the tobacco granules 214. For example, by injecting the susceptor particles when manufacturing the tobacco granules 214, the tobacco granules 214 including the susceptor particles may be manufactured.

[0112] In some embodiments, the flavoring sheet may be injected in a cut-out form.

[0113] In some other embodiments, as illustrated in FIG. 6, the flavoring sheet 10 may be added in a rolled or folded form. For example, the flavoring sheet 10 may be added to the filter segments 211 and 213 or the cavity segment 212 in a rolled or folded shape with irregular patterns (see 10-1), a swirling shape (see 10-2), a concentric shape (see 10-3), or a multi-folded shape (see 10-4; e.g. a folded shape so that an airflow path is secured in a longitudinal direction). When the flavoring sheet 10 is added in the illustrated shape, the airflow path is secured in the longitudinal direction to ensure a smooth air flow and appropriate suction resistance. In addition, a contact area between the flavoring sheet 10 and a high-temperature airflow is increased, so that the transfer amount of the flavoring may be increased.

[0114] In some other embodiments, the flavoring sheet 10 may be applied (e.g. attached) to a wrapper of the aerosol-generating article. For example, the flavoring sheet 10 may be disposed inside the wrapper of the filter segments 211 and 213 or the cavity segment 212. When the wrapper includes a metal foil, the flavoring sheet 10 may be disposed inside the metal foil. Alternatively, the flavoring sheet 10 may constitute at least a part of the wrapper. For example, the flavoring sheet 10 itself may function (or be used) as a wrapper, or a wrapping material manufactured in a form in which the flavoring sheet 10 and a wrapping paper are integrated may be used as the wrapper.

[0115] In the above embodiments, the flavoring sheet 10 may be processed through a predetermined process. However, the specific processing form may vary.

[0116] For example, as illustrated in FIG. 7, the flavoring sheet 10 may be processed to be wrinkled or folded in a longitudinal direction (i.e., an MD direction) of the aerosol-generating article. For example, the flavoring sheet 10 may be wrinkled or folded according to at least one of a crimping process, a pleating process, a folding process, and a gathering process. Specifically, the crimping process is a process in which creeps are imparted to a sheet surface through a difference between a roller pressure and a speed of a crimping machine, and is divided into a wet process and a dry process. The wet process refers to a process in which a base paper is soaked in water, softened, crimped, and then re-dried. The dry process means a dry process by two dryers with mutual different temperatures. Those skilled in the art will already know the pleating process, the folding process, and the gathering process, and thus, more description thereof will be omitted. According to the embodiment, a plurality of channels may be formed in the longitudinal direction in the flavoring sheet 10 through at least one of the illustrated processes, and a smooth air flow and appropriate suction resistance may be ensured through the formed channels. In addition, a contact area between the flavoring sheet 10 and the high-temperature airflow is increased, so that the transfer amount of the flavoring may be increased.

[0117] The flavoring sheet 10 described above may be manufactured through steps of preparing a sheet composition in a liquid state (e.g. slurry state) and drying the prepared sheet composition. Here, the liquid state may include a mixed state (e.g. slurry state) of a liquid and a solid as well as the liquid state. For example, the flavoring sheet 10 may be manufactured by stretching (casting) and drying the sheet composition on a predetermined substrate. However, the present invention is not limited thereto, and a specific manufacturing method may also vary.

[0118] The detailed composition of the sheet composition may be designed variously, but in some embodiments, the sheet composition may be formed by mixing a solvent such as distilled water and ethanol, a polysaccharide material (or a hydrocolloid material), and a flavoring. The flavoring sheet 10 prepared from such a sheet composition has excellent

flavor retention and flavor reservation, thereby greatly enhancing flavor development and flavor persistence of the aerosol-generating article. Hereinafter, each constituent material of the sheet composition will be described.

[0119] A solvent such as distilled water or ethanol may be an element for controlling the viscosity of the slurry-type sheet composition.

[0120] Next, the polysaccharide material may be a material for coating and fixing the flavoring, and a sheet former for forming a sheet. Examples of the polysaccharide material may include cellulose-based materials such as hydroxypropylmethylcellulose (HPMC), methylcellulose (MC), carboxymethylcellulose (CMC), and agar. Since these cellulose-based materials have a property of absorbing heat well through a phase change upon contact with a high-temperature airflow, the flavoring sheet 10 may be used as a cooling material as well as a flavoring material.

[0121] In some embodiments, the sheet composition may include modified cellulose among various polysaccharide materials. Here, the "modified cellulose" may refer to cellulose in which a specific functional group is substituted in a molecular structure. Examples of modified cellulose may include HPMC, MC, CMC, and EC, but are not limited thereto. For example, HPMC may have a grade within the range of about 4 to 40000 depending on a substituted ratio and molecular weights of a hydroxypropyl group and a methyl group (or methoxy group). Depending on the grade, the viscosity of the modified cellulose may be determined. More specifically, the physicochemical properties of HPMC are related to a ratio of the methoxy group, a ratio of the hydroxypropyl group, and a molecular weight. According to the United States Pharmacopoeia (USP), types of HPMC may be classified into HPMC1828, HPMC2208, HPMC2906, HPMC2910, and the like according to a ratio of the methoxy group and the hydroxypropyl group. Here, the first two numbers may mean a ratio of the methoxy group, and the latter two numbers may mean a ratio of the hydroxypropyl group. As a result of continuous experiments by the present inventors, it was confirmed that the flavoring sheet 10 prepared from the sheet composition including the modified cellulose was excellent in sheet physical properties and flavor retention.

[0122] Next, examples of the flavoring may include menthol, nicotine, nicotine salt, leaf tobacco extract, leaf tobacco extract containing nicotine, natural plant flavors (e.g. cinnamon, sage, herbs, chamomile, winter hay, sweet tea, clove, lavender, cardamom, dried clove buds, nutmeg, bergamot, geranium, honey essence, rose oil, lemon, orange, cinnamon, caraway, jasmine, ginger, coriander, vanilla extract, spearmint, peppermint, cassia, coffee, celery, cascarilla, sandalwood, cocoa, ylang-ylang, fennel, anise, licorice, St. John's bread, plum extract, peach extract, etc.), sugars (e.g. glucose, fructose, isomerized glucose syrup, caramel, etc.), cocoas (powder, extract, etc.), esters (e.g. isoamyl acetate, linalyl acetate, isoamyl propionate, linalyl butyrate, etc.), ketones (e.g. menthone, ionone, damascenone, ethyl maltol, etc.), alcohols (e.g. geraniol, linalol, anetol, eugenol, etc.), aldehydes (e.g. vanillin, benzaldehyde, anisaldehyde, etc.), lactones (e.g. γ-undecalactone, γ-nonalactone, etc.), animal flavorings (e.g. musk, ambergris, civet, castrium, etc.), and hydrocarbons (e.g. limonene, pinene, etc.). The flavoring may be used as a solid, and may be used to be dissolved or dispersed in an appropriate solvent, such as propylene glycol, ethyl alcohol, benzyl alcohol, or triethyl citrate. In addition, flavorings that are easily dispersed in a solvent by addition of an emulsifier, for example, hydrophobic flavorings and oil-soluble flavorings may be used. These flavorings may be used alone or may be used as a mixture. However, the scope of the present invention is not limited to these examples.

[0123] In some embodiments, flavorings having a melting point of about 80°C or less may be used. In this case, when the flavoring sheet 10 comes into contact with an airflow of 80°C or higher, the flavoring is phase-changed and absorbs more heat, thereby further improving the cooling performance of the flavoring sheet 10. In general, considering that the temperature of the heated aerosol is 80°C or higher, the use of these flavorings may effectively enhance the cooling performance of most aerosol-generating articles. In addition, the flavor development of the aerosol-generating article may be enhanced by easily volatilizing the phase-changed flavoring. An example of a flavoring having a melting point of about 80°C or less may include menthol, but is not limited thereto.

[0124] Meanwhile, in some embodiments, the sheet composition may further comprise low methoxyl pectin (LM-pectin). The LM-pectin is low-ester pectin or low-methoxyl pectin in which esterification is relatively low, and specifically, may refer to pectin containing less than about 50% of carboxyl groups in the molecular structure. Unlike carrageenan, the LM-pectin has a no-gelling property during coldness releasing to lower the viscosity of the slurry-type sheet composition (e.g. about 600 cp to 800 cp). In addition, it is possible to prepare a slurry-type sheet composition without an emulsifier, thereby being free from a safety problem due to the emulsifier.

[0125] The LM-pectin may contain less than about 50%, less than about 40%, less than about 30%, less than about 20%, or less than about 10% of carboxyl groups in the molecular structure. As the content of carboxyl groups in the molecular structure of the LM-pectin decreases, the viscosity of the slurry containing the LM-pectin may be lowered.

[0126] In addition, in some embodiments, the sheet composition may further comprise a bulking agent. The bulking agent may be a material that increases the total mass (i.e. dry mass) of components other than distilled water to increase the volume of the flavoring sheet 10 to be manufactured, but does not affect the original function of the flavoring sheet 10. Specifically, the bulking agent increases the volume of the flavoring sheet 10, but may have a property that does not adversely affect a flavoring retention function of the flavoring sheet 10 while not substantially increasing the viscosity of the slurry. Preferably, the bulking agent may be starches, modified starch, or starch hydrolysate. However, the present

invention is not limited thereto.

[0127] The modified starch refers to starch acetate, oxidized starch, hydroxypropyl distarch phosphate, hydroxypropyl starch, distarch phosphate, monostarch phosphate, phosphated distarch phosphate, and the like.

[0128] The starch hydrolysate refers to a material obtained by a process including a process of hydrolyzing starch. The starch hydrolysate may include, for example, a material (i.e. dextrin) obtained by directly hydrolyzing starch, or a material (i.e. indigestible dextrin) obtained by heating and then hydrolyzing starch. The bulking agent may be, for example, dextrin, and more specifically, cyclodextrin.

[0129] The starch hydrolysate may generally be a starch hydrolysate having a DE value in the range of about 2 to about 40, preferably a starch hydrolysate having a DE value in the range of about 2 to about 20. As the starch hydrolysate having the DE value in the range of about 2 to about 20, for example, Finedex #100 (Matsutani Chemical Industry Co., Ltd.), Fine Fiber (Matsutani Chemical Industry Co., Ltd.), TK-16 (Matsutani Chemical Industry Co., Ltd.) may be utilized.

[0130] Here, "DE" is an abbreviation for dextrose equivalent, and the DE value indicates the degree of hydrolysis of starch, that is, a saccharification rate of starch. In the present invention, the DE value may be a value measured by a Willstatter-Schudel method. The properties of hydrolyzed starch (starch hydrolysate), for example, the molecular weight of the starch hydrolysate and the arrangement of sugar molecules constituting the starch hydrolysate, are not constant for each molecule of the starch hydrolysate, and exists with a certain distribution or variation. Depending on the distribution or variation of the properties of the starch hydrolysate, a difference in cut sections, or the like, the starch hydrolysate may exhibit different physical properties (e.g. DE value) for each molecule thereof. As such, the starch hydrolysate is a set of molecules exhibiting different physical properties, but the measurement result (i.e. DE value) by the Willstatter-Schudel method has been handled as a representative value indicating the degree of hydrolysis of starch.

[0131] Preferably, the starch hydrolysate may be selected from the group consisting of dextrin having a DE value of about 2 to about 5, indigestible dextrin having a DE value of about 10 to about 15, and mixtures thereof. As the dextrin having the DE value of about 2 to about 5, for example, Finedex #100 (Matsutani Chemical Industry Co., Ltd.) may be utilized. As the indigestible dextrin having the DE value of about 10 to about 15, for example, Finefiber (Matsutani Chemical Industry Co., Ltd.) may be utilized.

[0132] In addition, in some embodiments, the sheet composition may further comprise a plasticizer. The plasticizer may improve the physical properties of the sheet by adding appropriate flexibility to the flavoring sheet 10. The plasticizer may comprise, for example, at least one of glycerin and propylene glycol, but is not limited thereto.

[0133] In addition, in some embodiments, the sheet composition may also further comprise an emulsifier. The emulsifier may increase the flavor retention amount of the flavoring sheet 10 by allowing an oil-soluble flavoring and a water-soluble polysaccharide material to be well mixed. Examples of the emulsifier may include lecithin, but are not limited thereto.

[0134] On the other hand, the flavoring sheet 10 prepared from the above-described sheet composition may have various content ratios (composition ratios).

[0135] In some embodiments, the flavoring sheet 10 may include about 20 to 60 parts by weight of the polysaccharide material and about 10 to 50 parts by weight of the flavoring, based on total 100 parts by weight thereof. Of course, the flavoring sheet 10 may further comprise an appropriate amount of moisture. It was confirmed that the flavoring sheet 10 configured above greatly enhanced the flavor development, flavor persistence and cooling performance of the aerosol-generating article.

[0136] In some embodiments, the flavoring sheet 10 may comprise about 2 to about 15 parts by weight of the moisture, about 25 to about 90 parts by weight of the modified cellulose, and about 0.1 to about 60 parts by weight of the flavoring, based on the total 100 parts by weight thereof.

[0137] Further, in some embodiments, the flavoring sheet 10 may comprise about 2 to about 15 parts by weight of the moisture, about 1 to about 60 parts by weight of the polysaccharide material, about 1 to about 60 parts by weight of the LM-pectin and about 0.1 to about 60 parts by weight of the flavoring, based on the total 100 parts by weight thereof.

[0138] In some embodiments, the plasticizer may be included in an amount of about 0.1 to about 15 parts by weight, preferably about 1 to 10 parts by weight, based on total 100 parts by weight of the flavoring sheet 10. For example, the flavoring sheet 10 may include about 20 to 60 parts by weight of the polysaccharide material, about 10 to 50 parts by weight of the flavoring, and about 1 to 10 parts by weight of the plasticizer, based on total 100 parts by weight thereof. Within the numerical range, a sheet having appropriate flexibility (physical properties) may be formed, and processing (e.g. crimping, rolling, folding, etc.) of the flavoring sheet 10 may be facilitated, thereby improving workability. For example, if the plasticizer is added too small, the flexibility of the sheet may be deteriorated so that the sheet may be easily broken during processing, and if the plasticizer is added too large, the sheet may not be formed well.

[0139] Hereinafter, preferred Examples are presented to help the understanding of the present invention, but the following Examples are only provided for easier understanding of the present invention, and the present invention is not limited thereto.

Examples 1 to 4 and Comparative Example 1: Manufacture of aerosol-generating device

[Example 1]

[0140] A cigarette rod was prepared by forming a cavity segment formed by mixing a flavoring sheet with fluidized tobacco granules (at a weight ratio of 1:1 of the granules and the flavoring sheet) and a first filter segment and a second filter segment at both ends of the cavity segment. At this time, the first filter segment and the second filter segment were further added with the same kind of flavoring liquid as the flavoring sheet in a spraying method (TJNS method). A filter rod was formed on one side of the cigarette rod to manufacture a smokeless cigarette.

[0141] The smokeless cigarette was inserted into an aerosol-generating device including a heater capable of heating the cavity segment, the first filter segment, and the second filter segment.

[Example 2]

[0142] A cigarette was manufactured in the same manner as in Example 1, except that no flavoring liquid was added to the first filter segment.

[Example 3]

[0143] A cigarette was manufactured in the same manner as in Example 1, except that no flavoring liquid was added to the second filter segment.

[Example 4]

[0144] A cigarette was manufactured in the same manner as in Example 1, except that no flavoring liquid was added to the first filter segment and the second filter segment.

[Comparative Example 1]

[0145] A cigarette was manufactured in the same manner as in Example 1, except for using a cavity segment which was not mixed with a flavoring sheet.

Experiment Example 1: Sensory evaluation result

[0146] By using the aerosol-generating devices manufactured in Examples 1 to 4 and Comparative Example 1, a quantitative evaluation (blind test) was performed for 5 skilled sensory evaluation panelists, and average values thereof were shown in Table 1 below by making points according to a 7-point scale method.

[Table 1]

	Example 1	Example 2	Example 3	Example 4	Comparative Example 1
Flavor intensity	4.67	4.07	4.10	3.8	2.00
Flavor persistence	4.17	3.90	3.83	3.50	2.00
Stimulus	2.17	2.17	2.27	2.33	2.17
Odor	1.33	1.57	1.57	2.00	2.17
Overall satisfaction	4.00	3.67	3.80	3.00	2.33

[0147] From the results of Table 1, it was found that, as in Examples 1 to 3, when the flavoring sheet was included in the cavity part, the flavor intensity and the flavor persistence were remarkably increased, and the odor was reduced.

[0148] While the present invention has been described by limited embodiments and drawings, it is to be understood that the present invention is not limited thereto, but is intended to cover various modifications and changes within the spirit of the present invention and the equivalent scope of the appended claims.

[Explanation of Reference Numerals and Symbols]

[0149]

1: Aerosol-generating device
2: Aerosol-generating article
10: Flavoring sheet
11: Battery
12: Controller
13: Heater
131: External heating element
21: Cigarette rod
22: Filter rod
211: First filter segment
212: Cavity segment
213: Second filter segment
214: Tobacco granules

Claims

1. An aerosol-generating article used together with an aerosol-generating device comprising:

a cigarette rod having a cavity segment filled with tobacco granules; and
a filter rod positioned downstream of the cigarette rod,
wherein the cigarette rod comprises a flavoring source.

2. The aerosol-generating article of claim 1, wherein the cigarette rod comprises a filter segment and a cavity segment, and a flavoring source is included in at least one of the filter segment and the cavity segment.

3. The aerosol-generating article of claim 2, wherein the filter segment comprises a first filter segment and a second filter segment, the first filter segment is positioned downstream of the cavity segment, the second filter segment is positioned upstream of the cavity segment, and the cavity segment is formed by the first filter segment and the second filter segment.

4. The aerosol-generating article of claim 1, wherein the filter rod comprises a cooling segment and a mouthpiece segment.

5. The aerosol-generating article of claim 1, wherein the flavoring source is at least one selected from the group consisting of a flavoring sheet, flavor-containing granules, and a TJNS filter.

6. The aerosol-generating article of claim 2 or 3, wherein the cavity segment comprises at least one of flavor-containing granules and a flavoring sheet.

7. The aerosol-generating article of claim 2, wherein the filter segment comprises at least one of a TJNS filter and a flavoring sheet.

8. The aerosol-generating article of claim 3, wherein at least one of the first filter segment and the second filter segment comprises at least one of a TJNS filter and a flavoring sheet.

9. The aerosol-generating article of claim 1, wherein the aerosol-generating device comprises a heater for heating the cigarette rod from the outside.

10. The aerosol-generating article of claim 2 or 3, wherein the aerosol-generating device comprises a heater for heating the cavity segment from the outside.

11. The aerosol-generating article of claim 3, wherein the aerosol-generating device comprises a heater for heating the cavity segment; and a part of at least one of the first filter segment and the second filter segment adjacent to the cavity segment.

Figure 1

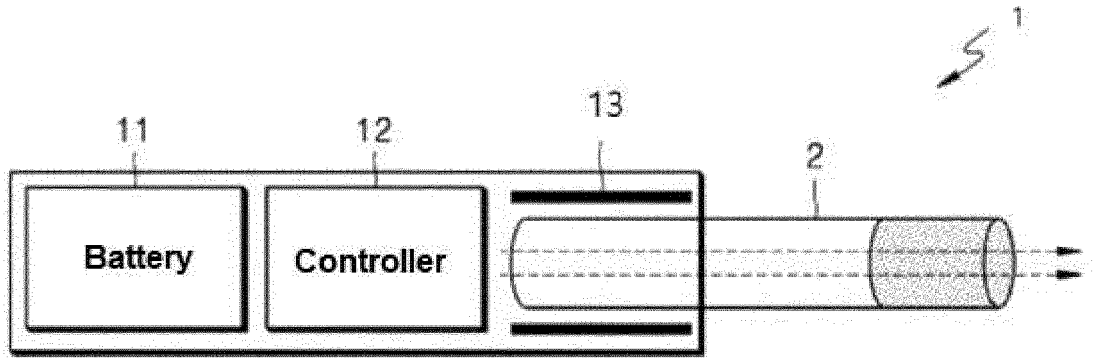


Figure 2

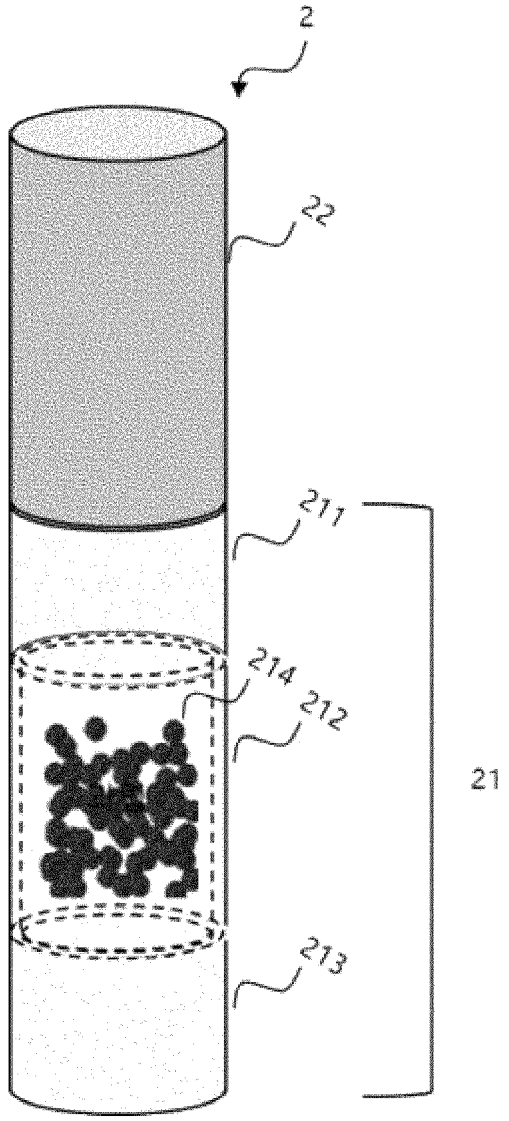


Figure 3

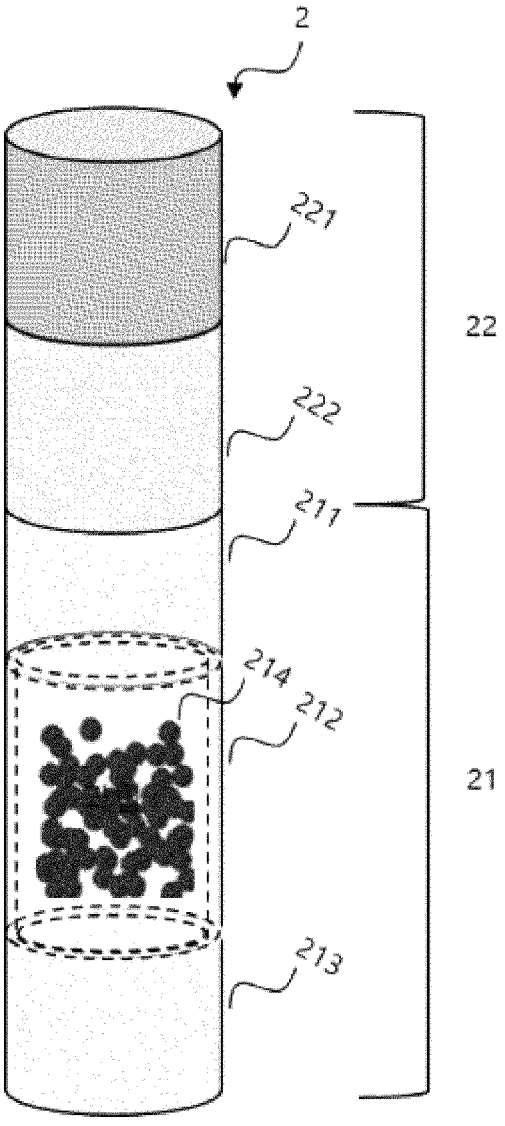


Figure 4

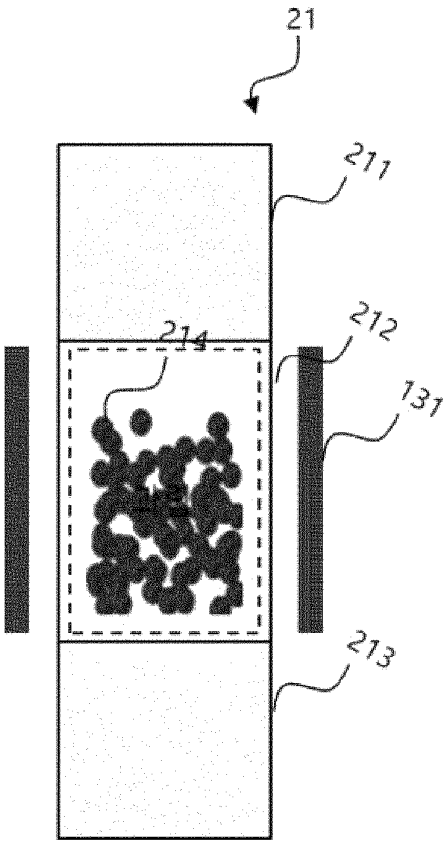


Figure 5

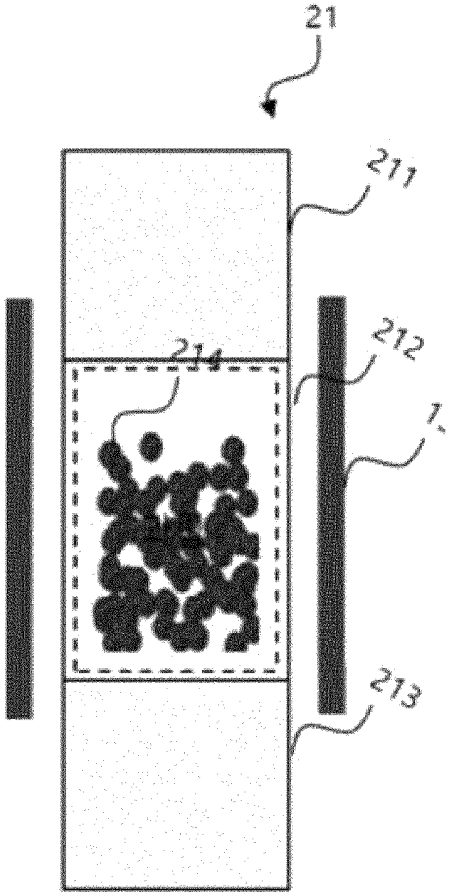


Figure 6

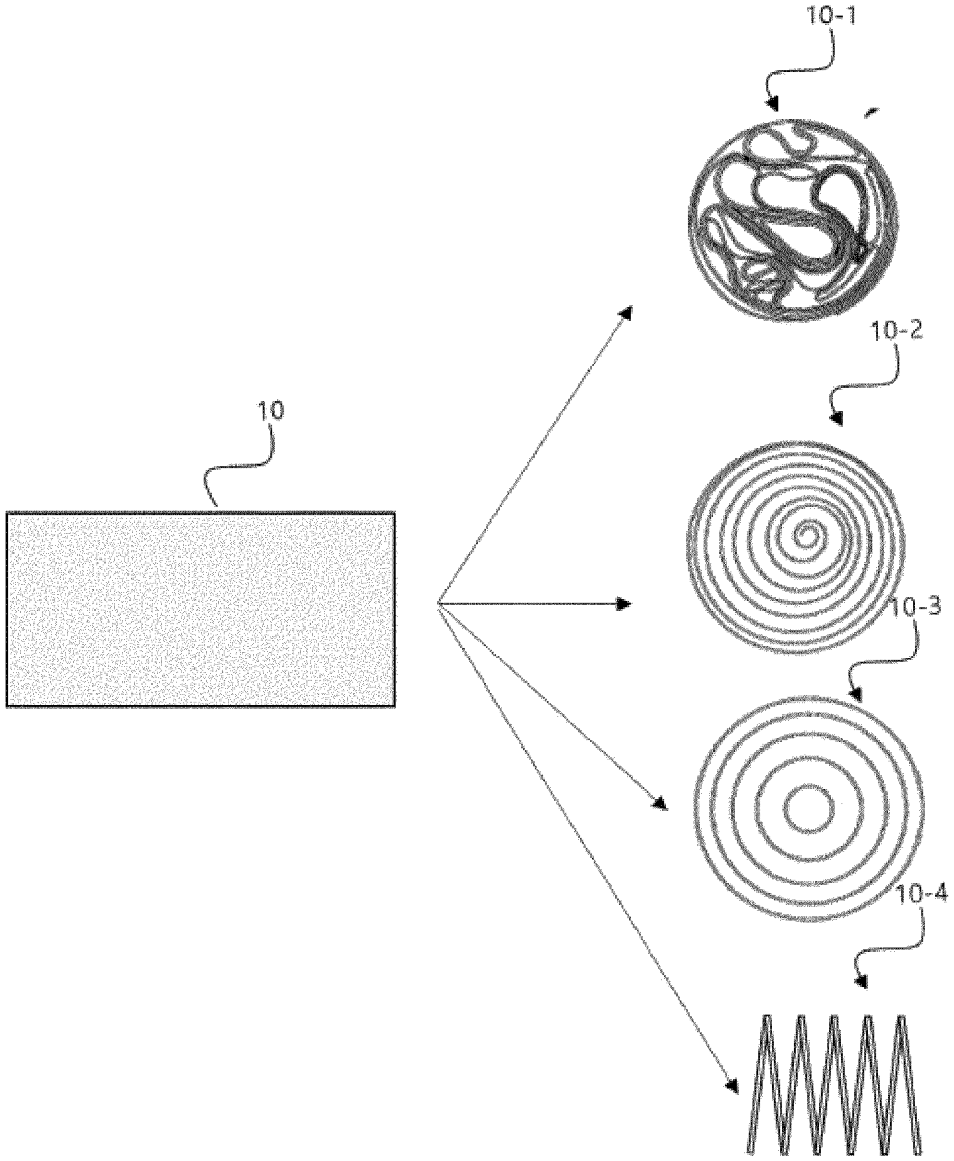
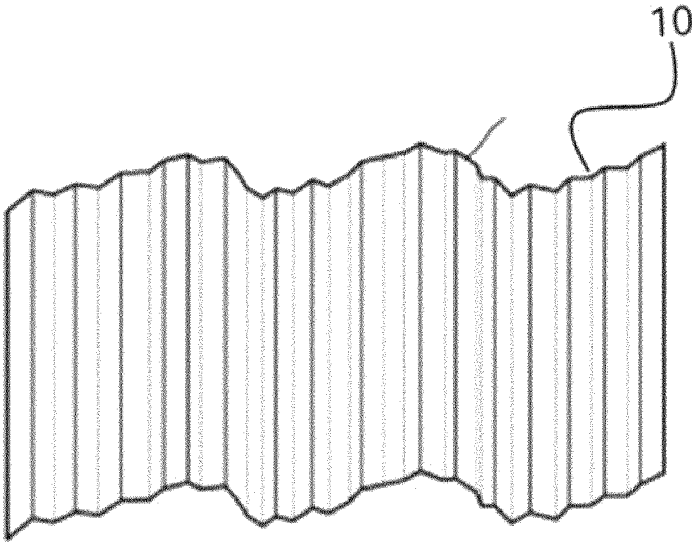


Figure 7



INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2022/003123

A. CLASSIFICATION OF SUBJECT MATTER

A24F 40/20(2020.01)i; **A24D 1/20**(2020.01)i; **A24D 3/02**(2006.01)i; **A24D 1/04**(2006.01)i; **A24F 40/46**(2020.01)i; **A24D 3/04**(2006.01)i; **A24D 1/00**(2006.01)i; **A24D 3/17**(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 40/20(2020.01); A24D 1/00(2006.01); A24D 3/06(2006.01); A24D 3/10(2006.01); A24D 3/17(2020.01); A24F 40/40(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), 캐비티 (cavity), 필터 (filter), 로드 (rod), 히터 (heater), 향미 (flavor)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	KR 10-2020-0070234 A (PHILIP MORRIS PRODUCTS S.A.) 17 June 2020 (2020-06-17) See paragraphs [0051]-[0054]; claims 1-12; and figures 1-2.	1-8
Y		9-11
Y	KR 10-2020-0068449 A (KT & G CORPORATION) 15 June 2020 (2020-06-15) See paragraph [0025]; and figure 1.	9-11
A	KR 10-2015-0134330 A (PHILIP MORRIS PRODUCTS S.A.) 01 December 2015 (2015-12-01) See entire document.	1-11
A	KR 10-2020-0061290 A (KT & G CORPORATION) 02 June 2020 (2020-06-02) See entire document.	1-11
A	WO 2015-177253 A1 (PHILIP MORRIS PRODUCTS S.A.) 26 November 2015 (2015-11-26) See entire document.	1-11

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

* Special categories of cited documents:
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"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
13 June 2022	**13 June 2022**
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.

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/KR2022/003123

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