



(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

(43) Date of publication:
02.03.2011 Bulletin 2011/09

(51) Int Cl.:
A24D 3/14 (2006.01) C11B 9/00 (2006.01)

(21) Application number: **09769950.8**

(86) International application number:
PCT/JP2009/056193

(22) Date of filing: **26.03.2009**

(87) International publication number:
WO 2009/157240 (30.12.2009 Gazette 2009/53)

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK TR
Designated Extension States:
AL BA RS

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(30) Priority: **25.06.2008 JP 2008166068**

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(54) **SMOKING ARTICLE**

(57) A smoking article includes an aerosol-generating section (11) and a filter section (12) attached to the aerosol-generating section (11). The filter section (12) contains a plurality of flavor-releasing particles (123)

each containing a water-soluble matrix containing a flavor component. The plurality of flavor-releasing particles (123) has respective particle diameters ranging from 1 to 100 μm and has an average particle diameter of 20 μm or less.

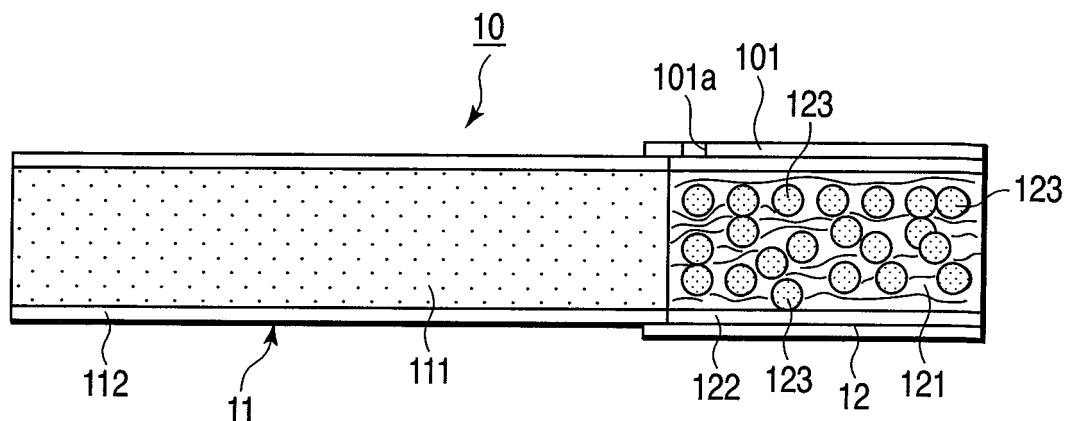


FIG. 1

Description

Technical Field

[0001] The present invention relates to a smoking article, especially a smoking article comprising a filter containing a flavor component.

Background Art

[0002] A smoking article, for example, a cigarette, is composed of various materials, such as tobacco shreds, paper, a filter, and activated carbon occasionally filled in the filter. Further, the cigarette and other smoking articles are loaded with various flavor components to create the taste and aroma peculiar to each cigarette product. In recent years, in order to offer a broader spectrum of flavor, it has been the practice to incorporate a flavor component in the filter attached to the cigarette so that the flavor exhibited by the cigarette per se can be altered or reinforced.

[0003] Heretofore, there have been employed a method in which a flavor component is directly incorporated in a filter, and a method in which a flavor component is adsorbed on porous particles, such as activate carbon, and the resultant porous particles are added to a filter, and the like, as a method for incorporating a flavor component in a cigarette filter. However, it is likely for the cigarette with a filter having a flavor component directly incorporated therein to be unable to ensure stable flavoring because of the migration of the flavor component from the filter section to another tobacco material section due to the adsorption equilibrium within the package through the distribution stage of the cigarette product. The cigarette with a filter containing porous particles having a flavor component adsorbed thereon cannot attain satisfactory release of the flavor component because of the incomplete desorption of the flavor component from the porous particles at the time of smoking.

[0004] Moreover, for example, Jpn. Pat. Appln. KOKAI Publication No. H4-75578 and Jpn. UM Appln. KOKOKU Publication No. H5-45198 disclose cigarettes of such a type that a filter is loaded with particles wherein a flavoring material is covered with a natural polysaccharide and at the time of smoking, the particles are collapsed to thereby release the flavor component. Further, Jpn. Pat. Appln. KOKAI Publication No. H10-279986 discloses a cigarette with a filter loaded with a flavor component including cyclodextrin. Still further, Jpn. UM Appln. KOKOKU Publication

[0005] No. S48-40719 discloses a filter loaded with a flavoring material capsule in which the covering is made of polyvinyl alcohol or the like. However, none of these cigarettes can ensure stable retention of a flavor component during the non-smoking period but immediate release of the flavor component at the time of smoking.

Disclosure of Invention

[0006] Therefore, it is an object of the present invention to provide a smoking article that can ensure stable retention of a flavor component but immediate release of the flavor component at the time of smoking.

[0007] In order to stably retain a flavor component in a filter during the non-smoking period, it is preferred to fix the flavor component in the filter. To this end, it would be best to incorporate the flavor component in an appropriate matrix material. Additionally, taking into account the efficient release of the flavor component at the time of smoking, it is preferred for the matrix material to be one not only easily soluble in the moisture contained in the aerosol generated during smoking but also having a large surface area for contact with the aerosol. Therefore, it is preferred to incorporate the flavor component in a water-soluble matrix with a particle diameter as small as possible. Taking this knowledge into account, the inventors have conducted extensive and intensive studies. As a result, they found that the intended object can be attained by incorporating the flavor component in water-soluble matrix particles having particle diameters ranging from 1 to 100 μm and having an average particle diameter of 20 μm or less.

[0008] Thus, according to the present invention, there is provided a smoking article comprising an aerosol-generating section and a filter section attached to the aerosol-generating section, the filter section containing a plurality of flavor-releasing particles each containing a water-soluble matrix containing a flavor component, the plurality of flavor-releasing particles having respective particle diameters ranging from 1 to 100 μm and having an average particle diameter of 20 μm or less.

Brief Description of Drawings

[0009]

FIG. 1 is a schematic sectional view illustrating one form of combustion-type smoking article according to the present invention.

FIG. 2 is a schematic sectional view illustrating another form of combustion-type smoking article according to the present invention.

FIG. 3 is a schematic sectional view illustrating one form of non-combustion-type smoking article according to the present invention.

FIG. 4 is a schematic sectional view illustrating a further form of combustion-type smoking article according to the present invention.

FIG. 5 is a schematic sectional view illustrating still a further form of combustion-type smoking article according to the present invention.

FIG. 6 is a schematic sectional view illustrating yet still a further form of combustion-type smoking article according to the present invention.

FIG. 7 is a graph illustrating the particle size distribution.

bution of flavor-releasing particles according to the present invention.

Best Mode for Carrying Out the Invention

[0010] A smoking article according to the present invention has a filter containing a plurality of flavor-releasing particles fitted to one end of an aerosol-generating section.

[0011] Each of the flavor-releasing particles comprises a water-soluble matrix containing a flavor component. Each flavor-releasing particle has a particle diameter ranging from 1 to 100 μm , preferably 1 to 50 μm , and the plurality of flavor-releasing particles contained in the filter have an average particle diameter of 20 μm or less, preferably 10 μm or less. Especially preferred flavor-releasing particles each have a particle diameter ranging from 1 to 50 μm and have an average particle diameter of 10 μm or less, usually 1 to 10 μm . In the present invention, both the particle diameter and average particle diameter are those measured by a laser diffraction/scattering method. The average particle diameter refers to a volume average diameter. The flavor-releasing particles according to the present invention have a narrow particle size distribution. The number of particles each having a diameter greater than zero but not exceeding 50 μm can account for 90% or more of the total number of particles. Preferably, the number of particles each having a diameter greater than zero but not exceeding 30 μm can account for 80% or more of the total number of particles.

[0012] The water-soluble matrix in which the flavor component is contained (incorporated) is not particularly limited as long as after the incorporation of the flavor component, the flavor component is not released during the non-smoking period (including the period of keeping and storage) of the smoking article. As the material of the matrix, use can be made of a water-soluble polymer, for example, dextrin, gelatin, gum arabic, polyvinyl alcohol, carboxymethylcellulose or the like. Dextrin is most preferred because of its high solubility in water. Dextrin can be dissolved in water in an amount of 50% by weight or more.

[0013] The flavor component for use in the present invention is not particularly limited as long as it satisfies the human palate through the taste and smell. Both hydrophobic and hydrophilic flavor components can be used. As examples of the hydrophobic flavor components, there can be mentioned menthol, esters (for example, isoamyl acetate, linalyl acetate, isoamyl propionate, linalyl butyrate and the like), natural essential oils (plant essential oils, such as a vanilla extract, spearmint, peppermint, cassia and jasmine, and animal essential oils, such as musk, amber, civet and castor) and simple flavoring materials (for example, anethole, limonene, linalool, eugenol and the like).

[0014] As examples of the hydrophilic flavor components, there can be mentioned a leaf tobacco extract, natural plant flavoring materials (for example, licorice, St.

John's bread, a plum extract, a peach extract and the like), acids (for example, malic acid, tartaric acid, citric acid and the like), sugars (for example, glucose, fructose, isomerized sugar and the like) and polyhydric alcohols (propylene glycol, glycerol, sorbitol and the like). These components can be used singly or in combination.

[0015] The configuration of the flavor-releasing particles is not particularly limited. However, being spherical is especially preferred.

[0016] In the present invention, especially preferred flavor-releasing particles are microparticles having particle diameters ranging from 1 to 50 μm and having an average particle diameter of 10 μm or less, usually 1 to 10 μm . Thus, the particles can be appropriately produced by means of a special spray dryer of a four-fluid nozzle spray type (Micromist dryer MDL-050M manufactured by Fujisaki Electric Co., Ltd.). The particles that can be produced by conventional spray dryers generally sold on the market have diameters whose average generally exceeds 30 μm , and the particle size distribution thereof is also broad.

[0017] In the production of flavor-releasing particles in which a hydrophobic flavor component has been incorporated, an emulsifying agent is used to emulsify the hydrophobic flavor component. The type of emulsifying agent is not limited. For example, use can be made of a sucrose fatty acid ester, a polyglycerol fatty acid ester, a glycerol fatty acid ester, a sorbitan fatty acid ester, lecithin or the like. Of the mentioned emulsifying agents, a sucrose fatty acid ester is especially preferred.

[0018] In the production of flavor-releasing particles containing a hydrophobic flavor component, first, a requisite amount of emulsifying agent is added to water and agitated at a temperature higher than the melting point of the emulsifying agent (for example, 50 to 60°C), thereby dissolving the emulsifying agent. Thereafter, a water-soluble matrix material (water-soluble polymer) is added and dissolved therein. Further, a hydrophobic flavor component is added and emulsified at 50 to 60°C by means of a homogenizing mixer so that the average particle diameter of the emulsion becomes 2 μm or less, preferably 0.5 μm or less. The resultant emulsion is spray dried (120 to 200°C) by means of the above micromist dryer. Thus, desired flavor-releasing particles can be obtained.

[0019] In the production of flavor-releasing particles containing a hydrophilic flavor component, it is not needed to add an emulsifying agent. The production can be accomplished by adding a hydrophilic flavor component to an aqueous solution of a water-soluble matrix material (water-soluble polymer), agitating the mixture to thereby obtain a solution, and spray drying the solution (120 to 200°C) by means of the above micromist dryer.

[0020] It is preferred for the amount of each of the components of the flavor-releasing particles to be as follows. The amount of water-soluble matrix material is in the range of 40 to 95% by weight, especially 70 to 90% by weight. The amount of emulsifying agent is in the range of 0.5 to 5% by weight, especially 1 to 2% by weight. The

amount of flavor component is in the range of trace to 50% by weight, especially 10 to 30% by weight. One type or two or more types of flavor-releasing particles can be added to a filter.

[0021] It has been ascertained that even when the flavor-releasing particles according to the present invention are stored for a prolonged period of time under the conditions of 55°C and 35% relative humidity or 22°C and 60% relative humidity, no release of the flavor component is found, exhibiting an extremely high retention stability, while the flavor component is released only after the particles are placed under high-humidity conditions of 22°C and 75% relative humidity.

[0022] The flavor-releasing particles are contained in a filter section. The material for constructing the filter is not particularly limited as long as the material can be applied to ordinary smoking. As examples of the filter materials, there can be mentioned, for example, cellulose acetate, paper, a non-woven sheet of natural pulp (filter fabricated by rolling this sheet into a rod form is commercially available from Japan Filter Technology, Ltd., under the trade name of Neo Filter), polypropylene and rayon.

[0023] In the smoking article of the present invention, the configuration of the filter section is not particularly limited as long as a filter containing the flavor-releasing particles according to the present invention is included therein. The filter section can include a charcoal filter. The charcoal filter is preferably disposed upstream of the filter containing the flavor-releasing particles according to the present invention in the direction of smoking in order to avoid the adsorption of flavor released at the time of smoking on charcoal. As examples of the structures of the filter sections, there can be mentioned a plain structure (only a filter containing the flavor-releasing particles according to the present invention), a dual structure (for example, a combination of a filter containing the flavor-releasing particles according to the present invention and a cellulose acetate filter, a combination of a charcoal filter and a filter containing the flavor-releasing particles according to the present invention, or the like), a triple filter (for example, a combination of a charcoal filter, a filter containing the flavor-releasing particles according to the present invention and a cellulose acetate filter, or the like), a multisegment structure (for example, a combination of a cellulose acetate filter, a charcoal filter, a filter containing the flavor-releasing particles according to the present invention and a cellulose acetate filter, or the like), a recess filter (for example, a cavity portion provided at a mouthpiece portion in each of these filter structures), a core-sheath dual concentric filter, a CVD (channel ventilation dam) filter, a thermoformed filter such as a filter provided at its central area with a hole (for example, a conical hole), and the like.

[0024] The smoking articles of the present invention include a combustion-type smoking article configured to, like usual cigarettes, generate an aerosol when combusted to thereby permit flavor tasting, and a non-combustion-type smoking article configured to generate an aer-

osol by heating, involving substantially no combustion of smoking material. The non-combustion-type smoking article generally comprises an aerosol-generating section containing an aerosol-generating substance capable of generating an aerosol when heated, and a heating source disposed at the distal end of the aerosol-generating section and separated physically from the aerosol-generating section, the heating source capable of heating the aerosol-generating substance by the heat of combustion. The expression "separated physically" means that the aerosol-generating section and the heat source are disposed as physically separate items (separate bodies).

[0025] The aerosol-generating section of the combustion-type smoking article contains a usual combustible smoking material, such as tobacco shreds. That is, the combustion-type smoking article of the present invention can have the same structure as that of usual cigarettes except that the filter section includes a filter containing the flavor-releasing particles according to the present invention.

[0026] The aerosol-generating section of the non-combustion-type smoking article contains an aerosol-generating substance capable of generating an aerosol when heated. As the aerosol-generating substance, use can be made of, for example, a polyhydric alcohol, such as glycerol, propylene glycol, triethylene glycol or tetraethylene glycol, or an aliphatic ester of carboxylic acid, such as methyl stearate, dimethyl dodecanedioate or dimethyl tetradecanedioate. The aerosol-generating substance is usually supported on an appropriate carrier, thereby providing an aerosol-generating member. A porous material, such as paper or activated carbon, can be used as the carrier. The aerosol-generating substance is absorbed into or adsorbed on the porous material. Alternatively, a glucan gel, such as curdlan, described in the specification of Japanese Patent No. 3,118,462 can be used as the carrier. Specifically, an aerosol-generating substance is added to an aqueous dispersion of heat-irreversibly coagulating glucan, and the resultant dispersion is cast in the form of a thin-film sheet on a support (for example, a stainless steel belt). Thereafter, the cast sheet is dried by heating to thereby gel the glucan. The thus obtained glucan gel holding the aerosol-generating substance can be shredded or pulverized for use. The carrier carrying the aerosol-generating substance (aerosol-generating member) can be accommodated in a cylindrical body formed of a nonflammable/heat insulating material, such as a paper sheet containing glass fibers, a ceramic or a paper sheet lined with a metal foil, thereby providing the aerosol-generating section. The heating source fitted to the distal end of the aerosol-generating section generally comprises a carbonaceous material.

[0027] Now, the present invention will be described with reference to the appended drawings. Through the drawings, the same reference numerals are used to denote the same elements, and any further repetitive descriptions of the same elements will be omitted.

[0028] FIG. 1 illustrates one form of smoking article of the present invention having the configuration of usual cigarettes. The illustrated smoking article (cigarette) 10 comprises a cylindrical aerosol-generating member (for example, tobacco shreds) 111 formed of a combustible smoking material (for example, tobacco shreds) usable for smoking, the circumference of which is wrapped with a wrapping paper 112, thereby constructing an aerosol-generating section 11. A filter section 12 is fitted to one end of the aerosol-generating section 11. In the cigarette of FIG. 1, the filter section 12 comprises a filter composed of a cylindrical filter material 121 with the same diameter as that of the aerosol-generating section 11 and a wrapping paper 122 enclosing the circumference thereof. The filter material 121 is loaded with dispersed flavor-releasing particles 123 according to the present invention. The aerosol-generating section 11 and the filter section 12 are joined together by means of a tipping paper 101. The tipping paper 101 can be provided with ventilation holes 101a in the same fashion as in usual cigarettes. The distal end of the aerosol-generating section 11 is ignited, and the aerosol-generating member is combusted, so that smoke can be drawn at the filter section 12. Smoke particles are brought into contact with the flavor-releasing particles incorporated in the filter section, and the flavor-releasing particles are dissolved and disintegrated by the moisture contained in the smoke particles, thereby releasing flavor. Thus, the flavor can be tasted.

[0029] FIG. 2 illustrates one form of smoking article of the present invention having the configuration of usual cigarettes which includes, in addition to a filter containing the flavor-releasing particles according to the present invention, a charcoal filter. The illustrated smoking article (cigarette) 20 comprises an aerosol-generating section 11 and, attached to one end thereof, a filter section 21 composed of a charcoal filter 13 and a filter 12 containing the flavor-releasing particles according to the present invention. The charcoal filter 13 is composed of a cylindrical filter material 131 and a wrapping paper 132 enclosing the circumference thereof. In the filter material 131, charcoal (activated carbon) particles not illustrated are dispersed. Alternatively, the charcoal filter 13 may be one in which the space to be filled with the filter material 131 is left as it is as a cavity and activated carbon particles are filled therein. The filter 12 and the filter 13 are integrated together by means of a wrapping paper not illustrated. The filter section 21 is joined to the aerosol-generating section 11 by means of a tipping paper 101 which may be provided with ventilation holes. The charcoal filter 13 is disposed upstream of the filter 12 containing the flavor-releasing particles according to the present invention in the direction of smoking, so that the flavor released from the flavor-releasing particles according to the present invention are substantially not adsorbed by the charcoal filter 13.

[0030] FIG. 3 illustrates one form of non-combustion-type smoking article according to the present invention. The illustrated non-combustion-type smoking article 30

includes a heat insulating cylindrical body 31, the interior of which is partitioned into four sections. In the first section disposed on the distal-end side of the cylindrical body 31, for example, a columnar carbonaceous heat source 32 provided on its circumference with a plurality of grooves (not illustrated) along the longitudinal direction thereof is inserted in the form of being accommodated in a heat insulating cylindrical body 33 formed of, for example, glass fibers. The second section succeeding the first section is filled with an aerosol-generating member 34 capable of generating an aerosol when heated. Tobacco shreds 35 can be accommodated in the third section succeeding the second section. The interior of the fourth section succeeding the third section is filled with a filter material 36 loaded with dispersed flavor-releasing particles 37 according to the present invention. The circumference of the cylindrical body 31 can further be covered with a paper material 38. In this non-combustion-type smoking article, a charcoal filter (not illustrated) can be disposed between the third section and the fourth section.

[0031] When the carbonaceous heat source 32 is ignited and a draught from the smoking article is taken, air is drawn through the grooves disposed on the circumference of the carbonaceous heat source 32, thereby heating the aerosol-generating members 34, 35 and thus generating an aerosol (smoke particles). The generated smoke particles are brought into contact with the flavor-releasing particles 37 incorporated in the filter material 36, so that the flavor-component holding material is dissolved and disintegrated by the moisture contained in the smoke particles, thereby releasing flavor.

[0032] FIG. 4 illustrates one form of combustion-type smoking article (cigarette) with a dual concentric filter. The illustrated cigarette 40 has a dual concentric filter 41 attached to the posterior end of the filter 12 of the cigarette illustrated in FIG. 1. The dual concentric filter 41 comprises a core portion 42 through which smoke passes and a sheath portion 43 enclosing the core portion 42. The core portion 42 is composed of a filter material 421 loaded with dispersed flavor-releasing particles 422 according to the present invention. The dual concentric filter 41 is wrapped with a wrapping paper 411. The sheath portion 43 is formed of a filter material 431. The filters 12 and 41 are integrated together by means of a wrapping paper not illustrated, and joined to an aerosol-generating section 11 by means of a tipping paper 101. The tipping paper 101 is provided with a plurality of ventilation holes 101a at a position corresponding to an area including the boundary of the filters 12 and 41. Outside air (diluent air) introduced thorough the ventilation holes 101a flows through the sheath portion 43 while smoke flows through the core portion.

[0033] FIG. 5 illustrates another form of combustion-type smoking article (cigarette) with a dual concentric filter. In the illustrated cigarette 50, a dual concentric filter 41 having a structure different from that of the dual concentric filter 51 of FIG. 4 is attached to the posterior end

of the filter 12 of the cigarette illustrated in FIG. 1. The dual concentric filter 51 comprises a core portion 52 through which smoke passes and a sheath portion 53 enclosing the core portion 52. The core portion 52 is formed of a filter material 521. The sheath portion 53 is composed of a filter material 531 loaded with dispersed flavor-releasing particles 532 according to the present invention. The dual concentric filter 51 is wrapped with a wrapping paper 511. The filters 12 and 51 are integrated together by means of a wrapping paper not illustrated, and joined to an aerosol-generating section 11 by means of a tipping paper 101. The tipping paper 101 is provided with a plurality of ventilation holes 101a at a position corresponding to an area including the boundary of the filters 12 and 41. Each of the ventilation holes runs through the tipping paper 101, wrapping paper not illustrated and wrapping papers 122, 511 and reaches the core portion 52. Outside air (diluent air) introduced thorough the ventilation holes 101a flows through the core portion 52 while smoke flows through the sheath portion 53.

[0034] FIG. 6 illustrates one form of smoking article (cigarette) with a multisegment filter section including a dual concentric filter. The illustrated cigarette 60 includes an aerosol-generating section 11 in the same fashion as in the cigarette of FIG. 1. The same charcoal filter 13 as illustrated in FIG. 2, the same filter 12 containing the flavor-releasing particles 123 according to the present invention as in FIG. 1, the same dual concentric filter 41 as illustrated in FIG. 4 and a usual filter 61 comprising a filter material 611 wrapped in a wrapping paper 612 are in this order fitted to one end of the aerosol-generating section 11. These four filters 13, 12, 41 and 61 are integrated together by means of a wrapping paper not illustrated, and joined to the aerosol-generating section 11 by means of a tipping paper 101. The tipping paper 101 is provided with a plurality of ventilation holes 101a at a position corresponding to an area including the boundary of the filters 12 and 41. Outside air (diluent air) introduced thorough the ventilation holes 101a flows through the sheath portion 43 of the filter 41 while smoke flows through the core portion 42 and is drawn through the filter 61 into the smoker's mouth.

[0035] The flavor-component holding material employed in the smoking article of the present invention exhibits the following characteristics. The particle diameter thereof is small, so that the area of contact with smoke particles is large. Further, the matrix material forming the flavor-releasing particles has a high solubility in water, so that not only can appropriate flavor release occur from the initial puff but also a high ratio of flavor release (12% or higher in the ratio of the migration of flavor component into smoke) can be attained.

[0036] The present invention will be described by way of its Examples. However, the present invention is in no way limited to these Examples.

Example 1

[0037] Sucrose fatty acid ester (HLB value: 11) as an emulsifying agent was added in an amount of 0.5 parts by weight to 59.5 parts by weight of purified water, and agitated at about 60°C for 10 minutes to thereby dissolve the ester in the water. Thereafter, 40.0 parts by weight of dextrin (dextrose equivalent value: 18) was added to the solution and dissolved therein. The temperature of the thus obtained solution was adjusted to 50 to 60°C, and 10.125 parts by weight of menthol was added to the solution and dissolved therein. Emulsification of the solution was carried out by means of a TK HOMO Mixer at 12,000 rpm for 10 minutes, thereby obtaining a spray liquid. The spray liquid consisted of an emulsion of 0.2 μm particle diameter. This spray liquid while maintaining its temperature at 50 to 60°C was fed to a spray dryer (spray dryer MDL-050M manufactured by Fujisaki Electric Co., Ltd.), and spray dried at 180°C, thereby obtaining desired flavor-releasing particles. The particle size distribution of these flavor-releasing particles was determined by means of a laser diffraction/scattering particle size distribution measuring apparatus (LA-920 manufactured by Horiba, Ltd.) (ethanol used as a particle dispersion medium). The results are given in FIG. 7. As apparent from FIG. 7, the particles produced by means of the four-fluid nozzle spray dryer have small diameters (particle diameters ranging from 1.151 to 44.938 μm), and the particle size distribution thereof is also very narrow. The volume average diameter of the obtained flavor-releasing particles was 9.2879 μm (median diameter: 8.2563 μm). It was found by an analysis that the obtained flavor-releasing particles consisted of 79% by weight of dextrin, 1% by weight of sucrose fatty acid ester and 20% by weight of menthol.

[0038] The above flavor-releasing particles were stored for three months under each of the condition of 55°C and 35% relative humidity and the condition of 22°C and 60% relative humidity, thereby studying the storage stability thereof. As a result, no release of menthol from the flavor-releasing particles was found under both the storage conditions, thereby attesting to an extremely high flavor retention stability. When the flavor-releasing particles were stored under the condition of 22°C and 75% relative humidity, for the first time, the release of menthol was found.

[0039] Further, a cellulose acetate filter of 2.8Y35000 and 18 mm length was loaded with 26 mg (amount of menthol: 6.3 mg) of these flavor-releasing particles in dispersed form, and fitted to the tobacco column portion of commercially available Mild Seven Super Light by means of a tipping paper. The tipping paper was provided with ventilation holes allowing the dilution ratio of mainstream smoke to be 40%. The thus obtained cigarette was smoked under the standard smoking conditions prescribed in ISO. The release of menthol concurrent with smoking was found, exhibiting the same puff pattern as that of usual menthol cigarette products. The tar quantity

was 7.1 mg/cigarette, and the nicotine quantity was 0.5 mg/cigarette. The amount of menthol released was 0.78 mg/cigarette, and the ratio of menthol migrated into smoke was 12.4%. The amount of menthol released was equivalent to or superior to that exhibited by usual menthol cigarettes with substantially the same tar value (0.4 to 0.6 mg/cigarette).

[0040] As described above, the smoking article of the present invention can stably retain a flavor component and, at the time of smoking, can immediately release the flavor component.

generates an aerosol.

9. The smoking article according to claim 1, wherein the aerosol-generating section when heated involving no combustion generates an aerosol.

Claims

1. A smoking article comprising an aerosol-generating section and a filter section attached to the aerosol-generating section, the filter section containing a plurality of flavor-releasing particles each containing a water-soluble matrix containing a flavor component, the plurality of flavor-releasing particles having respective particle diameters ranging from 1 to 100 μm and having an average particle diameter of 20 μm or less.
2. The smoking article according to claim 1, wherein the particle diameters range from 1 to 50 μm , and the average particle diameter is 10 μm or less.
3. The smoking article according to claim 2, wherein with respect to the flavor-releasing particles, the number of particles each having a diameter greater than zero but not exceeding 50 μm accounts for 90% or more of a total number of particles.
4. The smoking article according to claim 1, wherein the water-soluble matrix comprises a water-soluble polymer.
5. The smoking article according to claim 4, wherein the water-soluble polymer is at least one polymer selected from the group consisting of dextrin, gelatin, gum arabic, polyvinyl alcohol and carboxymethylcellulose.
6. The smoking article according to claim 1, wherein the flavor component is a hydrophilic flavor component.
7. The smoking article according to claim 1, wherein the flavor component is a hydrophobic flavor component, and each of the flavor-releasing particles further contains an emulsifying agent capable of emulsifying the hydrophobic flavor component into the matrix.
8. The smoking article according to claim 1, wherein the aerosol-generating section when combusted

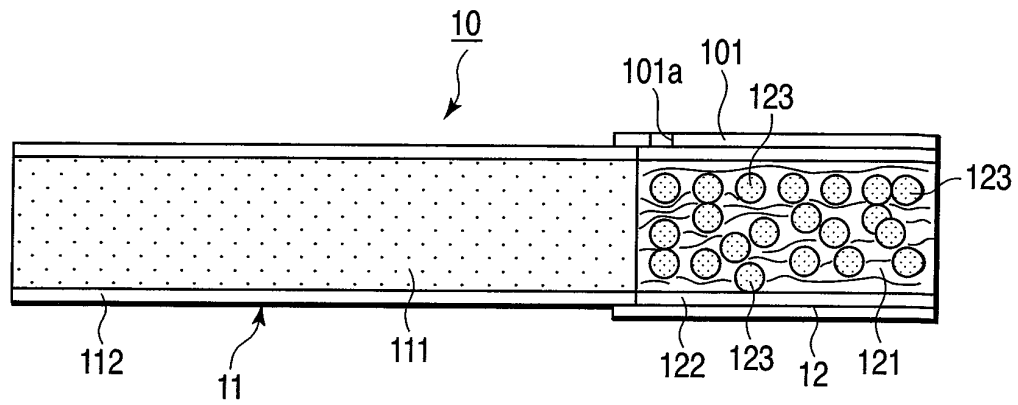


FIG. 1

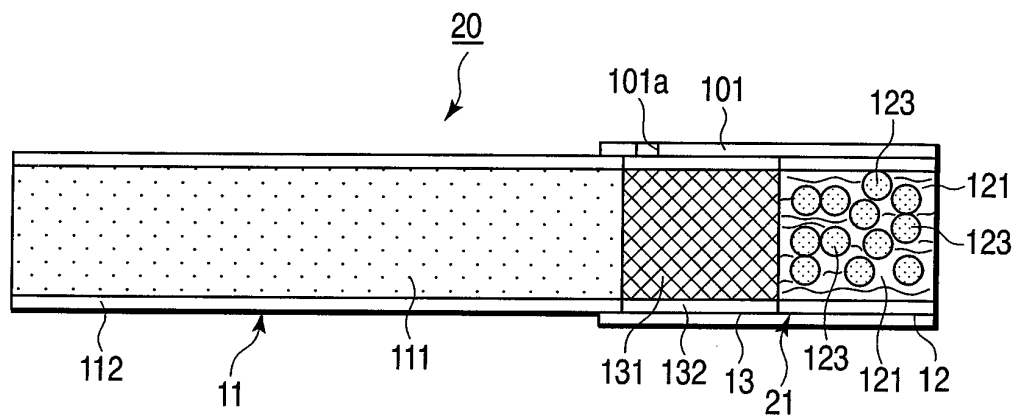


FIG. 2

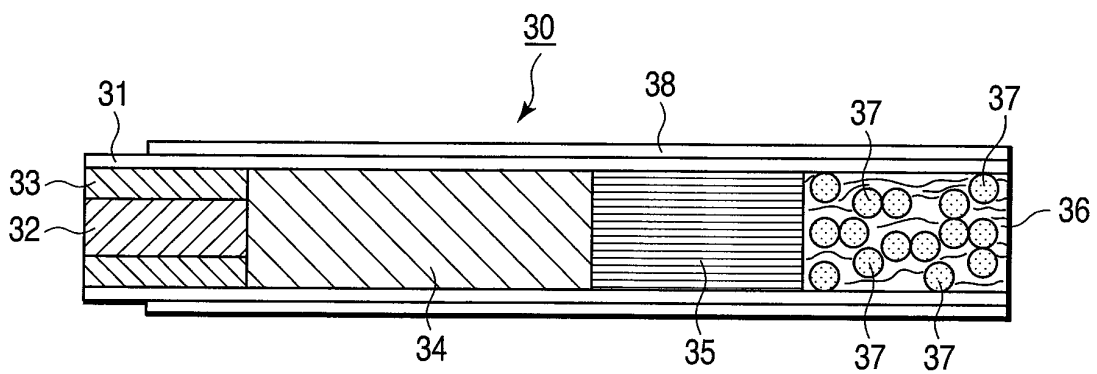


FIG. 3

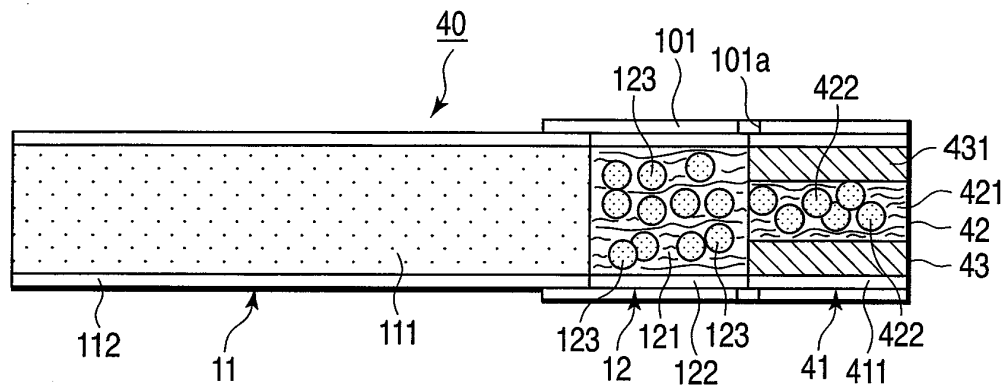


FIG. 4

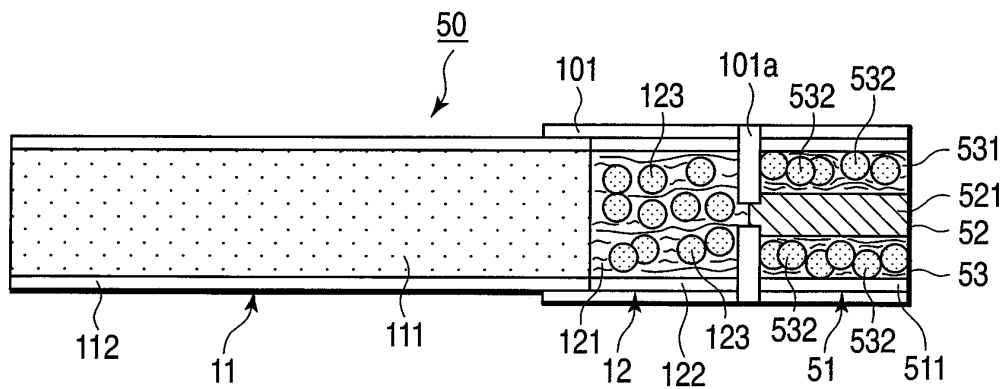


FIG. 5

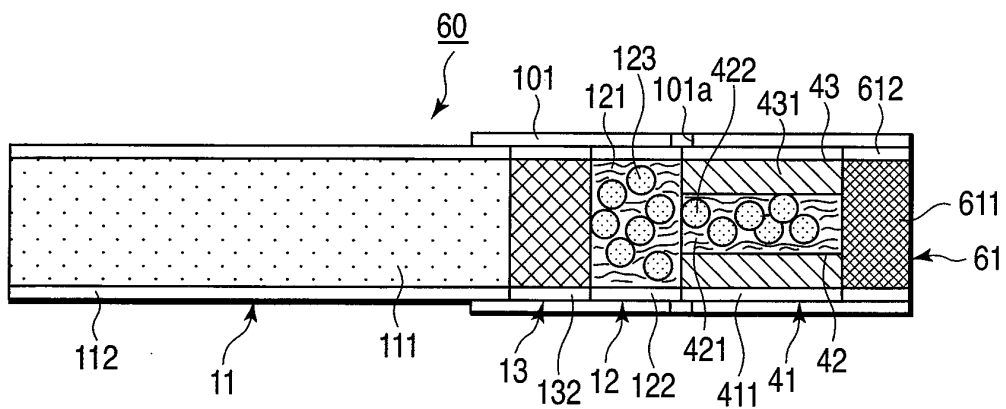


FIG. 6

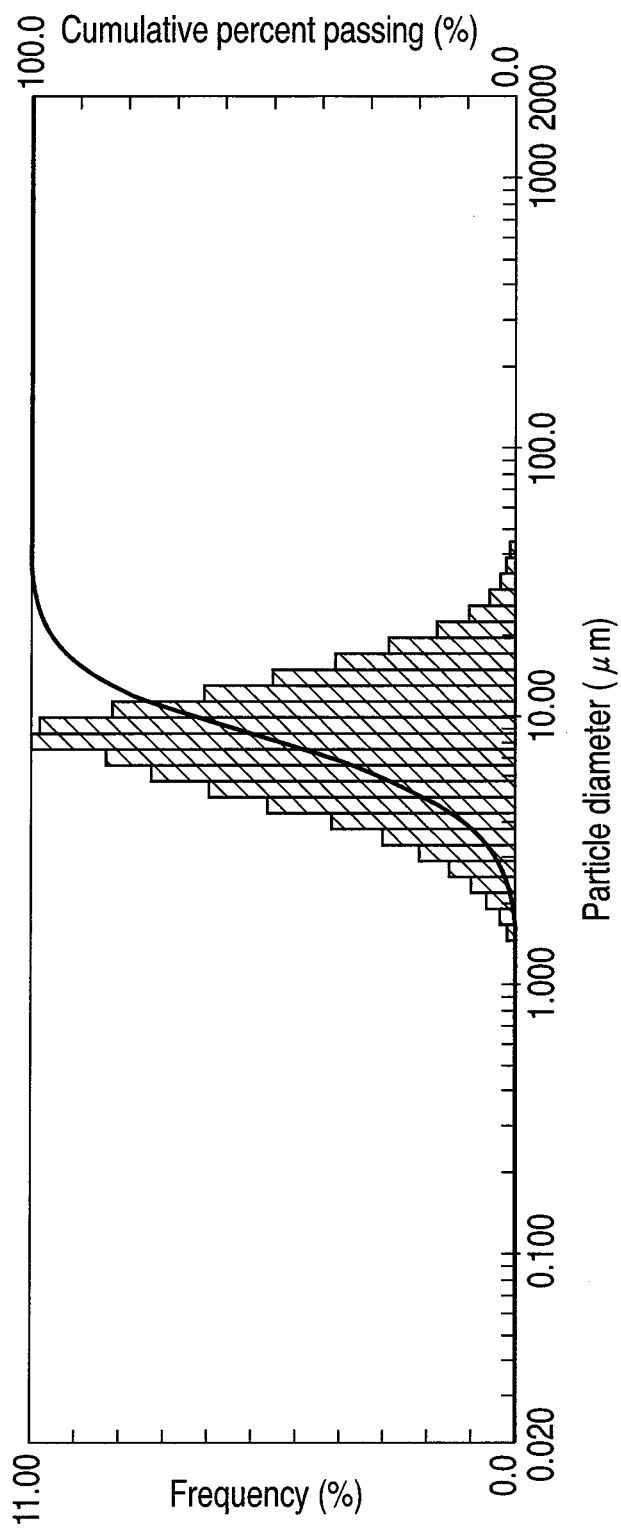


FIG. 7

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2009/056193

A. CLASSIFICATION OF SUBJECT MATTER

A24D3/14 (2006.01) i, C11B9/00 (2006.01) i

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A24D3/14, C11B9/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Jitsuyo Shinan Koho	1922-1996	Jitsuyo Shinan Toroku Koho	1996-2009
Kokai Jitsuyo Shinan Koho	1971-2009	Toroku Jitsuyo Shinan Koho	1994-2009

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	JP 4-207188 A (Taiho Tsusho Kabushiki Kaisha), 29 July, 1992 (29.07.92), Full text (Family: none)	1-5, 8 6, 7, 9
Y	JP 2709077 B2 (Japan Tobacco Inc.), 17 October, 1997 (17.10.97), Full text; all drawings & JP 1-60363 A & US 4889144 A & EP 292949 A2 & DE 3854281 C & PH 25732 A & HK 96696 A & GR 3017096 T & KR 10-1991-0000142 B	6, 7

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

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12 June, 2009 (12.06.09)Date of mailing of the international search report
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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 3786698 B2 (Philip Morris Products, Inc.), 31 March, 2006 (31.03.06), Full text; all drawings (Family: none)	9
A	JP 4-75578 A (Japan Tobacco Inc.), 10 March, 1992 (10.03.92), Full text; all drawings & US 5186185 A & EP 464324 A2 & DE 69105833 C	1-9
A	JP 5-45198 Y2 (Japan Tobacco Inc.), 17 November, 1993 (17.11.93), Full text; all drawings & JP 1-127495 U	1-9
A	JP 10-279986 A (Japan Tobacco Inc.), 20 October, 1998 (20.10.98), Full text; all drawings (Family: none)	1-9
A	JP 48-40719 Y2 (Nippon Senbai Kosha), 28 November, 1973 (28.11.73), Full text; all drawings (Family: none)	1-9
P, Y	JP 2008-156791 A (Rengo Co., Ltd.), 10 July, 2008 (10.07.08), Par. Nos. [0002] to [0003] & EP 2042635 A1 & WO 2008/078682 A & WO 2008/078682 A1	1-9

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Patent documents cited in the description

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