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(54) **SMOKING MATERIAL INCLUDING EXPANDED SHRED TOBACCO, METHOD FOR PREPARING SAME, AND SMOKING ARTICLE COMPRISING SAME**

(57) The present disclosure relates to a smoking material including expanded tobacco leaves, wherein the expanded tobacco leaves are included in an amount of 50% by weight (wt%) or greater in the smoking material and prepared by a low temperature expansion process, relates to a method of preparing the smoking material, and relates to a smoking article including the smoking material, wherein the smoking material, including the expanded tobacco leaves prepared by the low temperature expansion process, has an excellent tobacco smoke taste.

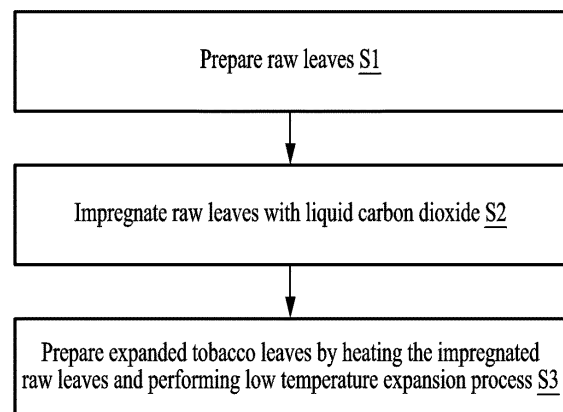


FIG. 1

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Description

Technical Field

5 **[0001]** The present disclosure relates to a smoking material including expanded tobacco leaves, a method of preparing the smoking material, and a smoking article including the smoking material.

Background Art

10 **[0002]** Since tobacco, which is used as a material for smoking products, is a high-value-added crop that is difficult to grow, efforts have been made to reduce the amount of tobacco to be used per cigarette by treating cut tobacco leaves and improve the flavor of smoking materials.

[0003] As part of these efforts, various methods of expanding tobacco raw materials, such as ligules, stems, and the like, are being developed and used, and currently commonly used methods of expanding cut tobacco leaves may be divided into methods by expanding agents and methods by freeze-drying.

15 **[0004]** As technology related to expansion methods by expanding agents, U.S. Patent Nos. 3,524,452 and 3,753,440 disclose methods of performing a treatment using an organic solvent, U.S. Patent Nos. 3,771,533 and 4,235,250 disclose methods of expanding cut tobacco leaves using carbon dioxide gas, and German Patent No. 2,903,330 and U.S. Patent No. 4,289,146 disclose methods of expanding cut tobacco leaves using argon (Ar) and nitrogen (N₂), respectively. In addition to the above methods, methods of expanding cut tobacco leaves using various types of gases or solvents have been developed and used.

20 **[0005]** However, when expansion processing is performed on cut tobacco leaves as in the above-described methods, there is an issue in that the unique flavor of the cut tobacco leaves is rather reduced.

25 Detailed Description of the Invention

Technical Goals

30 **[0006]** For such reasons, the present disclosure provides a smoking material including 50% by weight (wt%) or greater of expanded tobacco leaves that are prepared by a low temperature expansion process and that have excellent flavor, provides a method of preparing the smoking material, and a smoking article including the smoking material.

[0007] However, goals obtainable from the present disclosure are not limited to the above-mentioned goal, and other unmentioned goals can be clearly understood from the following description by one of ordinary skill in the art to which the present disclosure pertains.

35 Technical Solutions

[0008] The present disclosure provides a smoking material including expanded tobacco leaves,
40 the expanded tobacco leaves are included in an amount of 50% by weight (wt%) or greater in the smoking material, and the expanded tobacco leaves are prepared by a low temperature expansion process.

[0009] In an embodiment of the present disclosure, the low temperature expansion process may be performed at a temperature of 200°C to 230°C.

45 **[0010]** In another embodiment of the present disclosure, the expanded tobacco leaves may be included in an amount of 60 wt% or greater in the smoking material.

[0011] In yet another embodiment of the present disclosure, the expanded tobacco leaves may include at least one selected from a group consisting of flue-cured tobacco, burley tobacco, oriental tobacco, and cigar leaves.

[0012] In yet another embodiment of the present disclosure, the expanded tobacco leaves may include 30 to 70 wt% of flue-cured tobacco, 10 to 50 wt% of burley tobacco, and 0 to 50 wt% of oriental tobacco.

50 **[0013]** In yet another embodiment of the present disclosure, the expanded tobacco leaves may be flavored with at least one moisturizer selected from a group consisting of propylene glycol and glycerin.

[0014] In yet another embodiment of the present disclosure, with respect to 100 parts by weight of the expanded tobacco leaves, the expanded tobacco leaves may be flavored with 0.1 to 10 parts by weight of propylene glycol and flavored with 0.01 to 5 parts by weight of glycerin.

55 **[0015]** In addition, the present disclosure provides a method of preparing a smoking material, wherein the material includes step S1 of preparing raw leaves.

step S2 of impregnating the raw leaves with liquid carbon dioxide; and
 step S3 of preparing expanded tobacco leaves by heating the impregnated raw leaves and performing a low temperature expansion process, wherein the expanded tobacco leaves are included in an amount of 50 wt% or greater in the smoking material.

[0016] In an embodiment of the present disclosure, after step S3, a step of performing flavoring with a moisturizer may be further included.

[0017] In addition, the present disclosure provides a smoking article including the smoking material according to the present disclosure.

Effects

[0018] Conventional expanded tobacco leaves had a problem in that the original taste of a cigarette was lost due to a reduction in the flavor because an expansion process was performed at a high temperature. However, in the present disclosure, a low temperature expansion process may be performed at a temperature of 230°C or less, and thus, it is possible to provide a smoking material with excellent flavor with a clean aftertaste due to a reduction in irritation without losing the original taste of the cigarette.

[0019] In addition, expanded tobacco leaves according to the present disclosure may have excellent expansion properties, to reduce an amount of cut tobacco leaves to be used, thereby reducing manufacturing costs and improving a combustibility.

[0020] Furthermore, the expanded tobacco leaves may be prepared at an optimum expansion temperature of 200°C to 230°C in which it is easy to control a moisture content, to minimize a change in moisture, and thus, it is possible to manufacture a smoking product with a stable quality.

[0021] It should be understood that the effects of the present disclosure are not limited to the above-described effects, but are construed as including all effects that can be inferred from the configurations and features described in the following description or claims of the present disclosure.

Brief Description of Drawings

[0022]

FIG. 1 is a diagram illustrating a method of preparing expanded tobacco leaves of the disclosure.

FIG. 2 is a graph illustrating sensory evaluation results of smoking products including expanded tobacco leaves expanded at 180°C and 370°C.

FIG. 3 is a graph illustrating sensory evaluation results of smoking products including expanded tobacco leaves expanded at 200°C and 370°C.

Best Mode for Carrying Out the Invention

[0023] Hereinafter, embodiments will be described in detail with reference to the accompanying drawings. However, various alterations and modifications may be made to the embodiments. Here, the embodiments are not construed to be limited by the descriptions of the present disclosure. The embodiments should be understood to include all changes, equivalents, and replacements within the idea and the technical scope of the disclosure.

[0024] The terminology used herein is for the purpose of describing particular embodiments only and is not intended to be limiting. The singular forms "a", "an", and "the" are intended to include the plural forms as well, unless the context clearly indicates otherwise. It will be further understood that the terms "comprises/comprising" and/or "includes/including" when used herein, specify the presence of stated features, integers, steps, operations, elements, and/or components, but do not preclude the presence or addition of one or more other features, integers, steps, operations, elements, components and/or groups thereof.

[0025] Unless otherwise defined, all terms including technical or scientific terms used herein have the same meaning as commonly understood by one of ordinary skill in the art to which the embodiments belong. It will be further understood that terms, such as those defined in commonly-used dictionaries, should be interpreted as having a meaning that is consistent with their meaning in the context of the relevant art and will not be interpreted in an idealized or overly formal sense unless expressly so defined herein.

[0026] Throughout the specification, when one part "includes" one component, this indicates that the part may further include another component instead of excluding another component.

[0027] In addition, throughout the specification, a "smoking material" refers to a part or area containing a smokeable material. In other words, the smoking material may be a material capable of generating an aerosol and may refer to a

part that contains a material transferring nicotine to a user.

[0028] Throughout the specification, a "smoking article" may refer to any product that can be smoked or any product that can provide a smoking experience, regardless of whether the product is based on tobacco, tobacco derivatives, expanded tobacco, reconstituted tobacco, or tobacco substitutes.

[0029] Hereinafter, a smoking material including expanded tobacco leaves according to the present disclosure and a method of preparing expanded tobacco leaves will be described in detail with reference to embodiments and drawings. However, the present disclosure is not limited to the embodiments and drawings.

[0030] The present disclosure corresponds to a smoking material including expanded tobacco leaves,

the expanded tobacco leaves are included in an amount of 50% by weight (wt%) or greater in the smoking material, and the expanded tobacco leaves are prepared by a low temperature expansion process.

[0031] In addition, as shown in FIG. 1, the present disclosure may provide a method of preparing a smoking material, the method including step S 1 of preparing raw leaves;

step S2 of impregnating the raw leaves with liquid carbon dioxide; and
step S3 of preparing expanded tobacco leaves by heating the impregnated raw leaves and performing a low temperature expansion process, wherein the expanded tobacco leaves are included in an amount of 50 wt% or greater in the smoking material.

[0032] According to an embodiment of the present disclosure, in step S2 of the present disclosure, the raw leaves are impregnated with the liquid carbon dioxide. A container in which the impregnating is performed may be in a high-pressure atmosphere or a vacuum atmosphere. Here, liquid carbon dioxide penetrates a pore structure of the raw leaves and freezes.

[0033] According to an embodiment of the present disclosure, in step S3 of the present disclosure, carbon dioxide in pores may be vaporized by heating the raw leaves and the low temperature expansion process may be performed, and the low temperature expansion process may be performed at a temperature of 200°C to 230°C. More desirably, the expansion process may be performed at a temperature of 200°C to 220 °C. When expansion is performed at a temperature less than 200°C, a variation in moisture content of the expanded tobacco leaves may increase, and a quality of a smoking product may not be uniform. When the expansion process is performed at a temperature greater than 230°C, a possibility of failing to enhance the original taste of a cigarette may exist.

[0034] The expansion process may be performed on a cut tobacco leaf and may show an excellent tobacco smoke taste due to use of cut tobacco leaves, in comparison to use of materials such as stems, ligules, and the like, and an increase in a volume of 20 to 50% is possible with respect to a volume of cut tobacco leaves before the expansion process, due to excellent expansion properties in comparison to other materials. In comparison, the volume increases by less than 30% during an expansion process of materials such as stems.

[0035] In addition, in the expanded tobacco leaves expanded by the low temperature expansion process, a loss of the original taste of the cigarette is minimized. The smoking material including the expanded tobacco leaves may provide a clean aftertaste while preventing the loss of the original taste of the cigarette by reducing irritation and off-flavor and off-odor.

[0036] The raw leaves may be cut to have an appropriate width and length, or may be cut after the expansion process. The expanded tobacco leaves may have a size of 0.5 to 4.0 mm, and cut tobacco leaves having a size of 0.85 mm or greater are included in an amount of 95 wt% or greater in the expanded tobacco leaves. The expanded tobacco leaves of the present disclosure described above have a large amount of effective cut tobacco leaves (0.85 mm or greater) after expansion.

[0037] According to an embodiment of the present disclosure, the expanded tobacco leaves may be included in an amount of 50 wt% or greater in the smoking material, and may desirably be included in an amount of 60 wt% or greater. The expanded tobacco leaves according to the present disclosure may be included in the above-described large amount to have an effect of reducing an amount of tobacco leaves to be used.

[0038] In particular, the smoking material of the present disclosure may include 100 wt% of expanded tobacco leaves, and in this case, the amount of tobacco leaves to be used itself may be reduced, a tobacco smoke taste may be enhanced, and at the same time, only a supply line of expanded tobacco leaves may be used without a separate lamina processing operation in a process line used for manufacturing a cigarette, and thus, controlling of a moisture content and a flavoring process may be easily performed.

[0039] According to an embodiment of the present disclosure, the expanded tobacco leaves may include at least one selected from a group consisting of flue-cured tobacco, burley tobacco, oriental tobacco, and cigar leaves. For example, based on the flue-cured tobacco, both the burley tobacco and the oriental tobacco may be included, only one of the burley tobacco and the oriental tobacco may be included, or only the burley tobacco may be included; or only the flue-

cured tobacco, instead of the other types of leaves, may be included.

[0040] More specifically, 30 to 70 wt% of flue-cured tobacco, 10 to 50 wt% of burley tobacco, and 0 to 50 wt% of oriental tobacco may be included. Desirably, 40 to 60 wt% of flue-cured tobacco, 10 to 30 wt% of burley tobacco, and 20 to 40 wt% of oriental tobacco may be included.

[0041] In the method of preparing the smoking material according to the present disclosure, after step S3, step S4 of adding general cut tobacco leaves that are not expanded may be further included. Types of general cut tobacco leaves that may be included in addition to the expanded tobacco leaves are not limited, and may be, for example, at least one selected from flue-cured tobacco, burley tobacco, oriental tobacco, cigar leaves, or Virginia, and the same leaf combination as that of the expanded tobacco leaves may be used, however, the types are merely examples and embodiments are not limited to the types. The other general cut tobacco leaves are processed through a typical process and may be processed, for example, through a humidification, flavoring, toasting, or a conditioning process, and the like.

[0042] According to an embodiment of the present disclosure, the expanded tobacco leaves may be flavored with at least one moisturizer selected from a group consisting of propylene glycol and glycerin. The expanded tobacco leaves may be flavored after the low temperature expansion process, and in particular, a casing treatment with a moisturizer, and the like is not performed on cut tobacco leaves used in the expanded tobacco leaves of the present disclosure at a step before the expansion process. The expanded tobacco leaves of the present disclosure may be flavored with a moisturizer after the expansion process, and thus, stably controlling of a moisture content may be possible such that the expanded tobacco leaves may be used in a smoking article.

[0043] According to an embodiment of the present disclosure, with respect to 100 parts by weight of the expanded tobacco leaves, the expanded tobacco leaves may be flavored with 0.1 to 10 parts by weight of propylene glycol and flavored with 0.01 to 5 parts by weight of glycerin. When the propylene glycol is used in an amount of less than 0.1 parts by weight, the tobacco smoke taste may be affected by a lack of a moisture retention capacity, and when the propylene glycol is used in an amount of greater than 10 parts by weight, the moisturizer may have an inappropriate viscosity. In addition, when the glycerin is used in an amount of less than 0.01 parts by weight, the tobacco smoke taste may be affected by a lack of a moisture retention capacity, and when the glycerin is used in an amount of greater than 5 parts by weight, the moisturizer may have an inappropriate viscosity.

[0044] In addition to propylene glycol and glycerin, the moisturizer may further include at least one of ethylene glycol, dipropylene glycol, diethylene glycol, triethylene glycol, tetraethylene glycol, and oleyl alcohol.

[0045] When flavoring with the moisturizer is performed, a flavoring agent may also be treated together with the moisturizer. The flavoring agent may include naturally generated flavor materials, herbal medicines, extracts of herbal medicines, synthetically obtained materials, or combinations thereof (e.g., tobacco, cannabis, licorice, hydrangea, eugenol, chamomile, fenugreek, clove, maple, matcha, menthol, mint, cinnamon, turmeric, herbs, cherries, berries, peaches, apples, oranges, mangoes, clementines, lemons, limes, grapes, blueberries, citrus fruits, spearmint, peppermint, lavender, aloe vera, sandalwood, bergamot, pine, rose oil, vanilla, lemon oil, orange oil, orange blossom, cherry blossom, jasmine, ylang-ylang, sage, mint oil from any species of coffee, eucalyptus, star anise, cocoa, lemongrass, rooibos, flax, ginkgo, hazel, hibiscus, laurel, Mate, orange peel, rose, tea (e.g., green tea or black tea), thyme, juniper, elderflower, basil, bay leaves, cumin, oregano, paprika, rosemary, saffron, lemon peel, mint, beefsteak plant, turmeric, coriander, myrtle, cassis, valerian, pimento, mace, damian, marjoram, olive, lemon balm, lemon basil, chive, Carum carvi, verbena, tarragon, limonene, thymol, camphene), flavour enhancers, bitterness receptor site blockers, sensorial receptor site activators or stimulators, sugars and/or sugar substitutes (e.g., sucralose, acesulfame potassium, aspartame, saccharine, cyclamates, lactose, sucrose, glucose, fructose, sorbitol, or mannitol), and other additives, such as charcoal, chlorophyll, minerals, herbal medicines, or breath freshening agents. They may be man-made, synthetic, or natural ingredients or blends thereof, but are not limited thereto.

[0046] In addition, the present disclosure may provide a smoking article including the smoking material.

[0047] The smoking article may include the expanded tobacco leaves of the present disclosure to have an encapsulated pressure drop (EPD) draw resistance of 60 to 120 mmHzO, and an unencapsulated pressure drop (UPD) draw resistance of 140 to 180 mmHzO. Since the expanded tobacco leaves are included, the smoking article of the present disclosure may exhibit a similar level of draw resistance to those of general smoking articles even though the weight of the smoking material is reduced. In addition, the smoking article may have a hardness of 80% or greater and may also have a hardness level similar to those of general smoking articles.

[0048] The smoking article may be a combustion-type smoking article or a heating-type smoking article. The combustion-type smoking article may be used in a tobacco material portion of a combustible smoking article such as a filter cigarette, a small cigar, and a cigar. The heating-type smoking article may refer to an article in which smoking is performed by applying heat using an electric heating device such as a heater, instead of burning.

[0049] The smoking article may include a smoking material and a filter portion, and may further include different types of segments depending on a shape of a smoking article.

[0050] The smoking article may include cigarette paper that surrounds the filter portion and the smoking material. The cigarette paper may be paper, flax, wood pulp, and a polymer material.

[0051] According to an embodiment of the present disclosure, the filter portion may be a mono filter, a dual filter, or a triple filter. In addition, the filter portion may include at least one filter among a porous matrix structure, a tube structure, and a paper tube structure. The filter may include a filter tow including a fibrous form, a filamentous form, or both, and the fibrous form and the filamentous form may each include at least one of a polymer, paper, cellulose acetate, activated carbon, and carbon. However, embodiments are not limited thereto. In some embodiments, a filter material may further include at least one filter material widely known in the art, such as activated carbon, an adsorbent including carbon, and the like.

[0052] In an example, the smoking article may have a diameter of 4 mm to 10 mm, and a circumference of 14 mm to 29 mm. In addition, the length may be in a range of 45 mm to 100 mm, but is not limited thereto.

[0053] Hereinafter, embodiments will be described in detail with reference to the accompanying drawings. However, various alterations and modifications may be made to the embodiments. Here, the embodiments are not construed to be limited by the descriptions of the present disclosure. The embodiments should be understood to include all changes, equivalents, and replacements within the idea and the technical scope of the disclosure.

[0054] Unless otherwise defined, all terms including technical or scientific terms used herein have the same meaning as commonly understood by one of ordinary skill in the art to which embodiments belong. It will be further understood that terms, such as those defined in commonly-used dictionaries, should be interpreted as having a meaning that is consistent with their meaning in the context of the relevant art and will not be interpreted in an idealized or overly formal sense unless expressly so defined herein.

[Examples]

1. Preparation of Expanded Tobacco Leaves

[0055] Preparation of expanded tobacco leaves according to the present disclosure was performed by preparing blended laminas (50 wt% of flue-cured tobacco, 20 wt% of oriental tobacco, and 30 wt% of burley tobacco). The laminas were cut to have a cut width of 0.9 mm, impregnated in a container containing liquid carbon dioxide, and heated at temperatures shown in Table 1 below such that carbon dioxide was evaporated, and an expansion process was performed.

[Table 1]

	Preparation Example 1	Preparation Example 2	Preparation Example 3	Preparation Example 4
Temperature of expansion pipe	180 °C	220 °C	370 °C	200 °C

2. Manufacturing of Cigarettes including Expanded Tobacco Leaves

[0056] Cigarettes including the prepared expanded tobacco leaves based on configurations of Table 2 shown below were manufactured. An acetate mono filter was used as a filter, and manufacturing was performed using tipping paper of 1000 CU.

Table 2

	Comparative Example 1	Comparative Example 2	Comparative Example 3	Comparative Example 4	Example 1	Example 2	Example 3	Example 4
Blended laminas	100	70	50	0	50	70	0	0
Expand ed tobacco leaves	0	0	50	100	0	0	0	0
	0	0	0	0	50	30	100	0
	0	30	0	0	0	0	0	0
	0	0	0	0	0	0	0	100
Total	100	100	100	100	100	100	100	100

[0057] With respect to the cigarettes, whether cut tobacco leaves fall off an end of each of the cigarettes was determined, and a great difference in a level at which cut tobacco leaves fall off an end of each of the cigarettes between examples and comparative examples was not found, based on 4.9 mg/cm² in Comparative Example 1, 10.1 mg/cm² in Comparative Example 2, 8.7 mg/cm² in Comparative Example 3, 9.0 mg/cm² in Comparative Example 4, and 6.7 mg/cm² in Example 3. As a result of identifying the combustibility, it was confirmed that combustion velocities of Examples 1 to 3 are greater by about 24% than those of Comparative Examples 1 to 4.

[0058] In addition, results obtained by measuring physical properties of the cigarettes of Comparative Examples 1, 2, 3, and 4, and Example 3 are shown in Table 3 below.

Table 3

Classification	Weight (mg) of cut tobacco leaves	Circumference (mm)	Dilution rate (%)	UPD (mmH ₂ O)	EPD (mmH ₂ O)	Hardness (%)
Comparative Example 1	709	24.59	67.4	73.1	142.9	77.6
Comparative Example 2	539	24.59	67.0	72.4	141.8	77.2
Comparative Example 3	519	24.63	68.1	70.7	135.4	73.3
Comparative Example 4	393	24.53	65.8	70.1	134.2	70.6
Example 3	386	24.57	68.0	73.0	135.7	74.5

[0059] Based on the results in Table 3, it can be found that the weight of cut tobacco leaves in a cigarette according to an example of the present disclosure was reduced by about 27%. In other words, it can be found that a quality of sensibility, such as a degree to which cut tobacco leaves fall off an end of the cigarette, of the cigarette according to the example of the present disclosure has an equal to those of comparative examples despite a reduction in the weight of the cut tobacco leaves, and accordingly, an air dilution rate may be reduced when the same smoke components are implemented.

[0060] As a result of measuring spots that appeared on leaves after storing the above cigarettes for two weeks, it was confirmed that a small number of spots appeared in the cigarettes according to the examples, and expansion properties of cut tobacco leaves of the manufactured cigarettes were identified and are shown in Table 4 below.

[Table 4]

Classification	Expansion properties (cm ³ /g)
Comparative Example 1	4.7
Comparative Example 2	5.8
Comparative Example 3	5.9
Comparative Example 4	7.0
Example 3	7.4

[0061] From the above results, it was confirmed that expansion properties of cut tobacco leaves according to the examples of the present disclosure were superior to those of the comparative examples.

3. Identification of Smoke Components of Manufactured Cigarettes

[0062] For the cigarettes of Comparative Examples 1, 2, 3, and 4, and Example 3, a total of "20" cigarettes were smoked by an automatic smoking machine under ISO smoking conditions, and tar, nicotine, carbon monoxide, carbon dioxide, and moisture among all smoke condensates collected on a Cambridge filter pad, and an average number of puffs were measured and are shown in Table 5.

Table 5

Classification	TPM	Tar	Nic.	CO	CO ₂	Moisture	Number of puffs
	mg/cig.						Number of times
Comparative Example 1	4.46	3.5	0.56	2.95	12.85	0.39	9.01
Comparative Example 2	3.58	2.9	0.41	2.67	10.83	0.29	7.12
Comparative Example 3	3.50	2.8	0.42	2.61	10.67	0.30	6.95
Comparative Example 4	2.44	1.9	0.28	2.01	7.65	0.21	5.17
Example 3	2.50	1.9	0.28	2.13	7.87	0.28	5.00

[0063] Referring to the above experiment results, it was confirmed that amounts of tar to be transferred in Comparative Example 4 and Example 3, in which the low temperature expansion process was performed as in the present disclosure, were about 35% less than that of the cigarette of Comparative Example 1.

4. Flavoring of Expanded Tobacco Leaves

[0064] To the expanded tobacco leaves of Preparation Examples 2, 3, and 4, moisturizers were added according to Table 6 shown below (100 kg of cut tobacco leaves). For each of "20" samples, the moisturizers were added, and average values thereof are shown. A flavoring agent was used together at the same time as adding of the moisturizers, to perform flavoring.

[Table 6]

Classification	Temperature of expansion pipe	Amount (unit: g) of moisturizer to be added			Amount of water to be added	Average moisture (%)
		PG	Gly	Water		
Comparative Example 5	370 °C	2000	500	5500	Appropriate amount	14.0 ~ 14.5%
Comparative Example 6	180 °C	600	150	1650	-	9.0 ~ 13.6%
Example 5	200 °C	600	150	1650	-	15.1%
Example 6	200 °C	-	-	-	Appropriate amount	14.0 ~ 14.5%

[0065] As a result of measuring moisture contents after the flavoring was performed, there was no significant difference in a moisture content between Example 5 and a high temperature expansion process, as shown in Table 6.

[0066] In Comparative Example 6, the average moisture content was low, and in particular, a considerably large variation in moisture contents between cut tobacco leaves was shown.

5. Sensory Evaluation of Cigarettes including Expanded Tobacco Leaves

[0067] Sensory evaluation was performed with respect to an inhaling sensation, smoke volume, an original taste of a cigarette, a tobacco smoke taste intensity, irritation, off-flavor and off-odor, refreshingness of aftertaste, and overall tobacco taste of smoking products including 100% of expanded tobacco leaves expanded at 180°C, 200°C, and 370°C, and the results thereof are shown in Table 7 below. The sensory evaluation was performed by a panel of twenty-five evaluators using cigarettes for each example after two weeks from manufacture, based on a total scale of "7" points.

[Table 7]

Classification	Inhaling sensation			Smoke volume			Original taste of cigarette		
Temperature of expansion pipe	180°C	200°C	370°C	180°C	200°C	370°C	180°C	200°C	370°C
Average	4.40	4.44	4.34	4.20	4.20	4.10	4.14	4.14	3.76

(continued)

Classification	Inhaling sensation			Smoke volume			Original taste of cigarette		
Classification	Tobacco smoke taste intensity			Irritation			Off-flavor and off-odor		
Temperature of expansion pipe	180 °C	200 °C	370 °C	180 °C	200 °C	370 °C	180 °C	200 °C	370 °C
Average	4.06	4.06	3.76	3.74	3.70	3.74	3.74	3.70	3.70
Classification	Refreshingness of aftertaste			Overall tobacco taste					
Temperature of expansion pipe	180 °C	200 °C	370 °C	180 °C		200 °C		370 °C	
Average	3.76	3.90	3.80	4.10		4.14		3.82	

[0068] From the above results, it was confirmed that the smoking product including the expanded tobacco leaves expanded at 200°C of the present disclosure had excellent sensory evaluation results in comparison to the smoking product including the expanded tobacco leaves expanded at 180°C or 370°C.

[0069] FIG. 2 illustrates a graph showing sensory evaluation results of a smoking product including cut tobacco leaves expanded at 180°C and a smoking product including cut tobacco leaves expanded at 370°C. Referring to FIG. 2, it was confirmed that the smoking product including the cut tobacco leaves expanded at 180°C showed better sensory evaluation results than a smoking product including 30% of the cut tobacco leaves expanded at 370°C.

[0070] FIG. 3 illustrates a graph showing sensory evaluation results of a smoking product including cut tobacco leaves expanded at 200°C and a smoking product including cut tobacco leaves expanded at 370°C. Referring to FIG. 3, it was confirmed that the smoking product including the cut tobacco leaves expanded at 200°C showed better sensory evaluation results than a smoking product including 30% of the cut tobacco leaves expanded at 370°C.

[0071] While the embodiments are described with reference to drawings, it will be apparent to one of ordinary skill in the art that various alterations and modifications in form and details may be made in these embodiments without departing from the spirit and scope of the claims and their equivalents. For example, suitable results may be achieved if the described techniques are performed in a different order and/or if components in a described system, architecture, device, or circuit are combined in a different manner and/or replaced or supplemented by other components or their equivalents.

[0072] Therefore, other implementations, other embodiments, and equivalents to the claims are also within the scope of the following claims.

Industrial Applicability

[0073] In the present disclosure, it is possible to provide a smoking material with excellent flavor with a clean aftertaste due to a reduction in irritation without losing the original taste of a cigarette, by performing a low temperature expansion process at a temperature of 230°C or less, and it is possible to reduce an amount of cut tobacco leaves to be used due to excellent expansion properties of expanded tobacco leaves according to the present disclosure, thereby reducing manufacturing costs and improving a combustibility. In addition, the expanded tobacco leaves may be prepared at an optimal expansion temperature of 200°C to 230°C in which it is easy to control a moisture content, to be used as a smoking product with a stable quality due to a minimized change in moisture.

Claims

1. A smoking material, comprising:

expanded tobacco leaves,

wherein the expanded tobacco leaves are included in an amount of 50% by weight (wt%) or greater in the smoking material, and

wherein the expanded tobacco leaves are prepared by a low temperature expansion process.

2. The smoking material of claim 1, wherein the low temperature expansion process is performed at a temperature of 200°C to 230°C.

3. The smoking material of claim 1, wherein the expanded tobacco leaves are included in an amount of 60 wt% or greater in the smoking material.

4. The smoking material of claim 1, wherein the expanded tobacco leaves include at least one selected from a group consisting of flue-cured tobacco, burley tobacco, oriental tobacco, and cigar leaves.
5. The smoking material of claim 4, wherein the expanded tobacco leaves include 30 to 70 wt% of flue-cured tobacco, 10 to 50 wt% of burley tobacco, and 0 to 50 wt% of oriental tobacco.
6. The smoking material of claim 1, wherein the expanded tobacco leaves are flavored with at least one moisturizer selected from a group consisting of propylene glycol and glycerin.
7. The smoking material of claim 6, wherein with respect to 100 parts by weight of the expanded tobacco leaves, the expanded tobacco leaves are flavored with 0.1 to 10 parts by weight of propylene glycol and flavored with 0.01 to 5 parts by weight of glycerin.
8. A method of preparing a smoking material, the method comprising:
 - step S1 of preparing raw leaves;
 - step S2 of impregnating the raw leaves with liquid carbon dioxide; and
 - step S3 of preparing expanded tobacco leaves by heating the impregnated raw leaves and performing a low temperature expansion process,wherein the expanded tobacco leaves are included in an amount of 50% by weight (wt%) or greater in the smoking material.
9. The method of claim 8, wherein the low temperature expansion process is performed at a temperature of 200°C to 230°C.
10. The method of claim 8, wherein the raw leaves include at least one selected from a group consisting of flue-cured tobacco, burley tobacco, oriental tobacco, and cigar leaves.
11. The method of claim 10, wherein the raw leaves include 30 to 70 wt% of flue-cured tobacco, 10 to 50 wt% of burley tobacco, and 0 to 50 wt% of oriental tobacco.
12. The method of claim 8, further comprising, after step S3: performing flavoring with a moisturizer.
13. The method of claim 12, wherein the moisturizer is at least one selected from a group consisting of propylene glycol and glycerin.
14. The method of claim 13, wherein with respect to 100 parts by weight of the expanded tobacco leaves, the expanded tobacco leaves are flavored with 0.1 to 10 parts by weight of propylene glycol, and 0.01 to 5 parts by weight of glycerin.
15. A smoking article comprising the smoking material of claim 1.

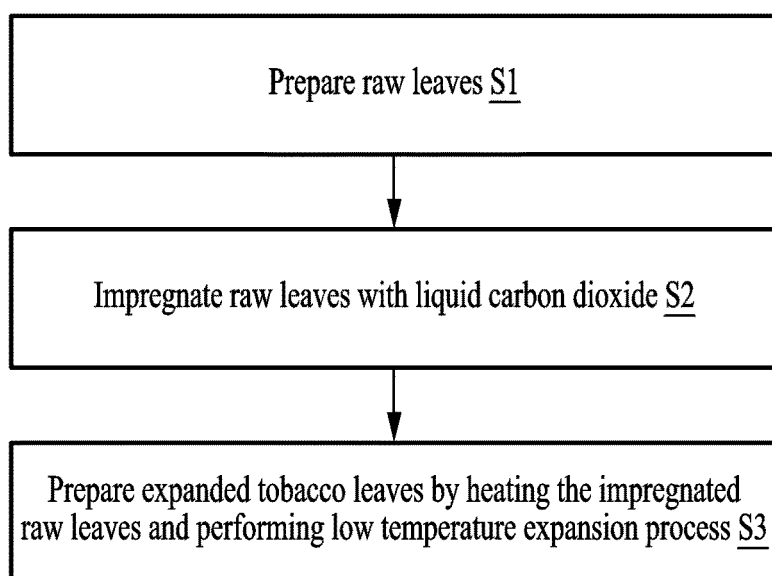


FIG. 1

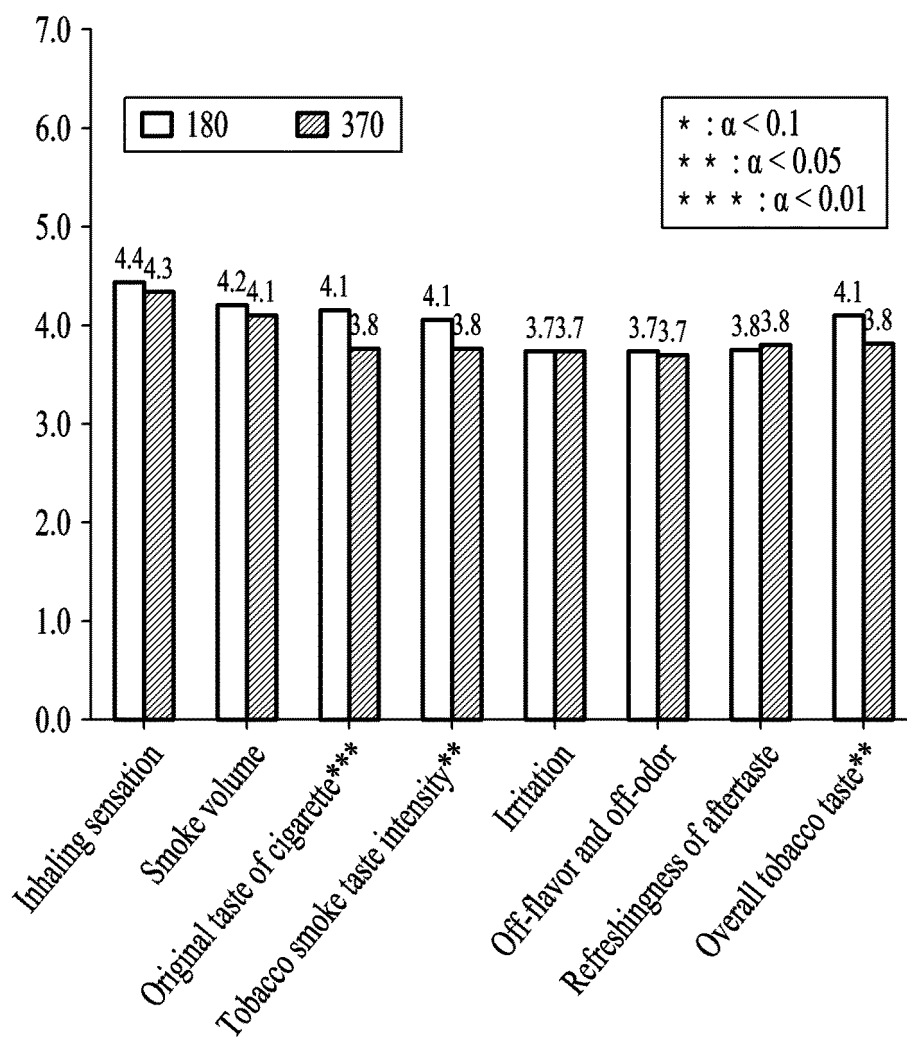


FIG. 2

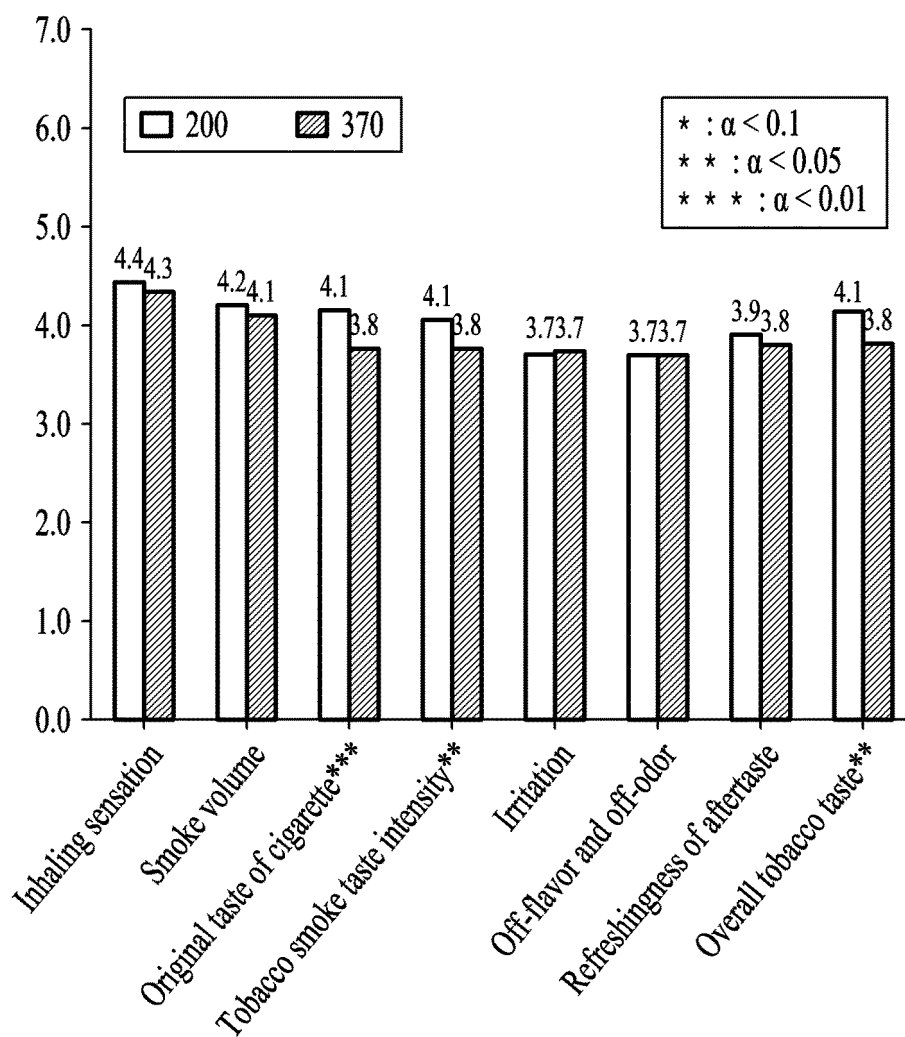


FIG. 3

INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR2023/018335

A. CLASSIFICATION OF SUBJECT MATTER

A24B 3/18(2006.01)i; A24B 13/02(2006.01)i; A24B 3/14(2006.01)i; A24B 15/14(2006.01)i; A24B 3/04(2006.01)i;
A24B 3/12(2006.01)i; A24B 3/10(2006.01)i; A24D 1/00(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)

A24B 3/18(2006.01); A24B 15/30(2006.01); A24B 15/42(2006.01); A24B 3/00(2006.01); A24B 3/04(2006.01);
A24B 3/10(2006.01); A24B 3/12(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: 팽화 각초(swelling cutting tobacco), 저온 팽화공정(low temperature swelling process), 액상 이산화탄소(liquid carbon dioxide), 함침(impregnation), 보습제(moisturizer)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	KR 10-2021-0016628 A (BRITISH AMERICAN TOBACCO (INVESTMENTS) LIMITED) 16 February 2021 (2021-02-16) See paragraphs [0038]-[0045], [0051], [0059], [0068], [0079], [0084]-[0085], [0100], [0102] and [0133].	1-15
A	KR 10-2013-0140792 A (PHILIP MORRIS PRODUCTS S.A.) 24 December 2013 (2013-12-24) See entire document.	1-15
A	US 2009-0032036 A1 (UEMATSU, Hiromi et al.) 05 February 2009 (2009-02-05) See entire document.	1-15
A	CN 101375735 A (WUHAN TOBACCO (GROUP) CO., LTD.) 04 March 2009 (2009-03-04) See entire document.	1-15
A	CN 105394805 A (CHINA TOBACCO ANHUI INDUSTRIAL CO., LTD.) 16 March 2016 (2016-03-16) See entire document.	1-15

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

* Special categories of cited documents:

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“O” document referring to an oral disclosure, use, exhibition or other means

“P” document published prior to the international filing date but later than the priority date claimed

“T” later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

“X” document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

“Y” document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

“&” document member of the same patent family

Date of the actual completion of the international search

21 February 2024

Date of mailing of the international search report

21 February 2024

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/KR2023/018335

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REFERENCES CITED IN THE DESCRIPTION

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