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(54) **PAPER FOR CONTROLLING MOISTURE IN SMOKING ARTICLE, AND SMOKING ARTICLE PACKAGE INCLUDING SAME**

(57) The present disclosure relates to paper for controlling moisture in a smoking article, which includes uncoated paper and has a basis weight of 220 grams per square meter (g/m²) to 260 g/m², and a thickness of 280 micrometers (μm) to 320 μm.

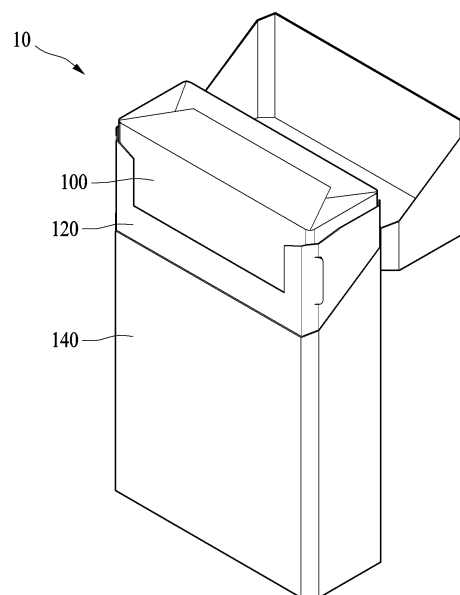


FIG. 1

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Description**Technical Field**

5 **[0001]** The present disclosure relates to paper for controlling moisture in a smoking article and a smoking article package including the same.

Background Art

10 **[0002]** A smoking article has been produced and sold in a state in which a smoking article group corresponding to a pack of cigarettes is stored in a smoking article packaging. Examples of the smoking article packaging include a package wrapper, an inner liner, an inner frame, and the like. Specifically, the smoking article group is wrapped with an inner liner, and the smoking article group wrapped with the inner liner is at least partially surrounded by an inner frame and received in space inside the package wrapper.

15 **[0003]** Material products are managed such that a manufactured smoking article has a moisture content of about 10%, and smoking articles are produced. When a smoking article is stored in a smoking article packaging, a moisture content is maintained by the smoking article packaging. However, after a smoking article package is exposed to a high moisture environment or a smoking article packaging is opened, the moisture content of the smoking article increases due to moisture flowing in from the outside, which causes a smoker to feel hot during smoking.

20 **[0004]** In general, a coating process is performed on base paper of an existing smoking article packaging to increase printability. To perform such a coating, the base paper needs to have water resistance, and accordingly, additives such as a wet strength agent and water resistant agent are added during manufacturing of the base paper. Since the above base paper absorbs a small amount of moisture in comparison to cellulose that does not contain an additive, a smoking article is exposed to a high moisture environment and the moisture content of the smoking article increases, when a
25 smoking article packaging is opened and resealed. Therefore, there is a need to develop a smoking article packaging that may better absorb moisture inside a packaging in comparison to the existing smoking article packaging.

Detailed Description of the Invention**Technical Goals**

30 **[0005]** To solve the above problems, an aspect of the present disclosure is to provide paper for controlling moisture in a smoking article that may prevent moisture from permeating into the smoking article as much as possible when manufacturing of a smoking article packaging is possible.

35 **[0006]** 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.

Technical Solutions

40 **[0007]** According to an embodiment of the present disclosure, there is provided paper for controlling moisture in a smoking article, wherein the paper includes uncoated paper, and has a basis weight of 220 grams per square meter (g/m²) to 260 g/m² and a thickness of 280 micrometers (μm) to 320 μm.

45 **[0008]** According to another aspect, there is provided a smoking article package including a smoking article, and one or more smoking article packagings, wherein at least one of the one or more smoking article packagings includes the paper for controlling moisture in the smoking article according to an embodiment of the present disclosure.

Effects

50 **[0009]** When a smoking article packaging is manufactured using paper for controlling moisture in a smoking article according to the present disclosure, the smoking article packaging may absorb moisture so that a moisture content of the smoking article may remain relatively uniform. In addition, as the moisture content of the smoking article does not
55 increase, it is possible to provide a uniform tobacco taste and prevent a smoker from feeling hot during smoking, thereby increasing smoking satisfaction.

[0010] 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

- 5 **[0011]** FIG. 1 is a diagram schematically illustrating a smoking article package 10 according to an embodiment of the present disclosure.

Best Mode for Carrying Out the Invention

- 10 **[0012]** Hereinafter, embodiments will be described in detail with reference to the accompanying drawing. However, various alterations and modifications may be made to the embodiments. Here, the embodiments are not meant 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.

- 15 **[0013]** 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.

- 20 **[0014]** Unless otherwise defined, all terms including technical and scientific terms used herein have the same meaning as commonly understood by one of ordinary skill in the art to which 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.

- 25 **[0015]** When describing the embodiments with reference to the accompanying drawing, like reference numerals refer to like components and a repeated description related thereto will be omitted. In the description of embodiments, detailed description of well-known related structures or functions will be omitted when it is deemed that such description will cause ambiguous interpretation of the present disclosure.

- 30 **[0016]** In addition, terms such as first, second, A, B, (a), (b), and the like may be used to describe components of the embodiments. These terms are used only for the purpose of discriminating one component from another component, and the nature, the sequences, or the orders of the components are not limited by the terms.

- [0017]** A component, which has the same common function as a component included in any one embodiment, will be described by using the same name in other embodiments. Unless otherwise mentioned, the descriptions on the embodiments may be applicable to the following embodiments and thus, duplicated descriptions will be omitted for conciseness.

- 35 **[0018]** In the present specification, when one part "includes" one component, this indicates that the part may further include another component instead of excluding another component.

- [0019]** Throughout the specification, a "smoking article" may refer to an article capable of generating an aerosol, such as a cigarette (tobacco), a cigar, and the like. The smoking article may include an aerosol generating material or an aerosol forming substrate. In addition, the smoking article may include a solid material based on tobacco raw materials such as a reconstituted tobacco sheet, cut tobacco leaves, reconstituted tobacco, and the like. A smoking material may include a volatile compound.

- 40 **[0020]** Throughout the specification, a smoking article package 10 may refer to the whole including a smoking article and a smoking article packaging.

- [0021]** Throughout the specification, "forming a pack" may refer to forming a pack having a correct shape. Specifically, "forming a pack" may refer to forming a packaging to be angled, such as a pack of cigarettes, and the like, using paper.

- 45 **[0022]** Throughout the specification, a "moisture content" may refer to an amount of moisture in a smoking article.

- [0023]** Throughout the specification, a "Cobb sizing degree" may be a value obtained by pouring a predetermined amount of water on paper having a predetermined area and measuring an amount of water absorbed by the paper as a weight.

- 50 **[0024]** Throughout the specification, a "moisture absorption rate" may be a value obtained by measuring a degree to which a smoking article absorbs moisture under a specific temperature and humidity.

- [0025]** Throughout the specification, a "smoking article group" may refer to a smoking article containing a pack of cigarettes.

- 55 **[0026]** Throughout the specification, "ordinary paper" may refer to paper containing an additive such as a wet strength agent, a water resistant agent, and the like.

- [0027]** According to an embodiment of the present disclosure, a paper for controlling moisture in a smoking article, including uncoated paper may be provided. Here, the paper for controlling moisture in the smoking article may have a basis weight of 220 grams per square meter (g/m²) to 260 g/m² and a thickness of 280 micrometers (μm) to 320 μm.

Desirably, the basis weight may be in a range of 228 g/m² to 248 g/m², and the thickness may be in a range of 285 μm to 305 μm.

[0028] The uncoated paper may refer to base paper that does not have water resistance because any additive is not added during manufacturing of paper. For example, an additive may be a wet strength agent, a water resistant agent, and the like, but is not limited thereto.

[0029] When the basis weight of the paper for controlling moisture in the smoking article exceeds 260 g/m² and the thickness of the paper exceeds 320 μm, bending stiffness and elasticity of the paper may increase, and accordingly, it may be difficult to form a pack using the paper and applying of facilities may be impossible. When the basis weight of the paper for controlling moisture in the smoking article is less than 220 g/m² and the thickness of the paper is less than 280 μm, it may be difficult to maintain a shape of the pack.

[0030] According to an embodiment of the present disclosure, the paper for controlling moisture in the smoking article may have a moisture content of 3% to 5%, and desirably have a moisture content of 3.5% to 4.5%. In other words, the moisture content of the paper itself may be similar to ordinary paper.

[0031] According to another embodiment of the present disclosure, the paper for controlling moisture in the smoking article may have a Cobb sizing degree of 340 cubic centimeters per square meter (cc/m²) to 360 cc/m² (based on a Cobb test for 20 seconds), and desirably have a Cobb sizing degree of 345 cc/m² to 355 cc/m². The paper for controlling moisture in the smoking article may absorb a relatively large amount of moisture than ordinary paper. For example, in the above condition, the Cobb sizing degree of the paper for controlling moisture in the smoking article may be enhanced by 13 to 17 times, desirably 13.6 to 14.4 times, in comparison to that of the ordinary paper.

[0032] According to an embodiment of the present disclosure, the paper for controlling moisture in the smoking article may have a wet tensile strength of 2 kilonewtons per meter (kN/m) or greater. For example, the wet tensile strength may be in a range of 2 kN/m to 6 kN/m, or a range of 3 kN/m to 5 kN/m. When the wet tensile strength is less than 2 kN/m, it may be difficult to maintain a shape of a pack due to an extremely large amount of moisture to be absorbed.

[0033] According to an embodiment of the present disclosure, the paper for controlling moisture in the smoking article may have a stiffness of 45 gram-force centimeters (gf·cm) or greater in a machine direction (MD) and 25 gf·cm or greater in a cross direction (CD). For example, the stiffness may be in a range of 45 gf·cm to 90 gf·cm or a range of 60 gf·cm to 80 gf·cm in the MD, and in a range of 25 gf·cm to 60 gf·cm or a range of 40 gf·cm to 50 gf·cm in the CD. When the stiffness is less than 45 gf·cm in the MD and/or less than 25 gf·cm in the CD, it may be difficult to maintain a shape of a pack because the paper for controlling moisture in the smoking article is not stiff.

[0034] According to an embodiment of the present disclosure, the paper for controlling moisture in the smoking article may have a roughness of 1.4 μm or less. For example, the roughness may be greater than 0 μm and less than or equal to 1.4 μm, and may be in a range of 1 μm to 1.4 μm or less. When the roughness exceeds 1.4 μm, it may be difficult to form a pack using paper, because the paper for controlling moisture in the smoking article is severely roughened.

[0035] According to an embodiment of the present disclosure, the paper for controlling moisture in the smoking article may have a gloss of 40% or greater. For example, the gloss may be in a range of 40% to 60%, or a range of 42% to 50%. A smoking article packaging may also function to enhance an aesthetic shape of a product due to printing of a design onto a surface. When the gloss of the paper for controlling moisture in the smoking article is less than 40%, printing may not be easily performed.

[0036] According to an embodiment of the present disclosure, the paper for controlling moisture in the smoking article may be used as a smoking article packaging. For example, the smoking article packaging may be an inner liner 100, an inner frame 120, or a package wrapper 140, but is not limited thereto.

[0037] According to another embodiment of the present disclosure, the smoking article package 10 may be provided. The smoking article package 10 may include a smoking article and a smoking article packaging, and paper for controlling moisture in the smoking article may include uncoated paper and may have a basis weight of 220 g/m² to 260 g/m² and a thickness of 280 μm to 320 μm. The smoking article packaging may be at least one selected from a group consisting of an inner liner 100, an inner frame 120, and a package wrapper 140. Here, the smoking article packaging may include the paper for controlling moisture in the smoking article. For example, in the smoking article package including the smoking article, the inner liner 100, and the package wrapper 140, the smoking article may be wrapped with the inner liner 100, and at least one of the inner liner 100 or the package wrapper 140 may include the paper for controlling moisture in the smoking article.

[0038] When the smoking article package 10 according to an embodiment of the present disclosure is conditioned under a room temperature condition, the smoking article may have a moisture absorption rate of 9% or greater and less than 9.5%. For example, the moisture absorption rate of a smoking article may be a moisture absorption rate when the smoking article package 10 is stored under a condition of a room temperature of 22°C and a relative humidity (%) of 55%.

[0039] When the smoking article package is exposed to a severe condition, the smoking article may be exposed to a high moisture environment. For example, the severe condition may be a condition of a temperature of 30°C and a relative humidity (%) of 75%.

[0040] However, even though four days elapsed after the smoking article package according to an embodiment of the

present disclosure is exposed to a severe condition, the smoking article may have a moisture absorption rate of 9.1% to 13%. In other words, the moisture absorption rate of the smoking article may be increased by 0.1% to 4%, desirably by 0.1% to 2.7%, in comparison to a moisture absorption rate in a case of performing conditioning for 4 days under the room temperature condition (the temperature of 22°C and the relative humidity (%) of 55%).

[0041] In addition, when a smoking article package packaged with a smoking article packaging including ordinary paper is severely conditioned, a moisture absorption rate of a smoking article may be greater than or equal to 17%, and the moisture absorption rate may be increased by 8% or greater in comparison to a case in which conditioning is performed under the room temperature condition. In other words, even though 4 days passed after the smoking article package according to an embodiment of the present disclosure is severely conditioned, the moisture content of the smoking article may remain relatively constant in comparison to when the smoking article package packaged with the smoking article packaging including the ordinary paper is severely conditioned.

[0042] Hereinafter, the present disclosure will be described in more detail through an example, however, the present disclosure is not limited to the example.

Design of Smoking Article Package

Design of Paper for Controlling Moisture in Smoking Article

[0043] A basis weight, a thickness, and a moisture content of paper for controlling moisture in a smoking article, including uncoated paper, according to an embodiment of the present disclosure were measured according to KS M ISO 536, KS M ISO 534, and KS M ISO 287, respectively, and as a result, the paper for controlling moisture in the smoking article has a basis weight of 242 g/m², a thickness of 301 μ m, and a moisture content of 4%. A wet tensile strength, stiffness, roughness, and gloss of the paper for controlling moisture in the smoking article are shown in Table 1 below. Here, the wet tensile strength, the stiffness, the gloss, and the roughness were measured according to KS M ISO 1924-3, KS M ISO 2493, KS M ISO 8254-1, and KS M ISO 8791-4, respectively.

[Table 1]

Wet tensile strength (kN/m)	Stiffness (gfcm)	Roughness (μ m)	Gloss (%)
4.2	75 in MD 45 in CD	1.30	42.6

Example

[0044] A smoking article package including a smoking article, and a smoking article packaging was manufactured. The smoking article was wrapped with an inner liner and received in a package wrapper. The inner liner and the package wrapper were manufactured using the paper for controlling moisture in the smoking article, including the uncoated paper.

Comparative Example

[0045] Manufacturing was performed in the same manner as in the example, except that an inner liner and a package wrapper were manufactured using ordinary paper. The ordinary paper may include 0.5 to 5% of a material, such as a resin, an epichlorohydrin resin, amphoteric starch, oxidized starch, and the like, as a wet strength agent, and 0.1 to 2.0% of a material, such as alkyl ketene dimer (AKD), and the like, as a water resistant agent.

Measurement of Cobb Sizing Degree of Paper for Controlling Moisture in Smoking Article

[0046] Cobb sizing degrees of paper of the example and comparative example were measured using a Cobb measurement method. The Cobb sizing degrees were measured under the following conditions based on a Cobb test for 20 seconds.

Condition 1: Temperature of 22°C and relative humidity of 40%

Condition 2: Temperature of 22°C and relative humidity of 60%

[0047] The Cobb sizing degrees are shown in Table 2 below.

[Table 2]

Classification	Condition	Cobb sizing degree (cc/m ²) of paper
Comparative Example	Condition 1	4.0
	Condition 2	25
Example	Condition 1	4.0
	Condition 2	350

[0048] In Condition 2, the Cobb sizing degree of the paper of the example was 350 cc/m², which was 14 times greater than the Cobb sizing degree of the paper of the comparative example. Thus, it can be found that a moisture absorption ability of the example is significantly increased in comparison to a moisture absorption ability of the comparative example.

3. Measurement of Moisture Absorption Rate of Smoking Article

[0049] Typically, a smoker consumes a pack of smoking articles within two days. Accordingly, after the example and comparative example were exposed and conditioned under Conditions 3 and 4 below, a moisture absorption rate of a medium portion of the smoking article was measured using MT-CA (Brabender model). The following Conditions 3 and 4 are shown below.

[0050] Condition 3 (room temperature condition): conditioning for the following period after exposure for 48 hours at a temperature of 22°C and a relative humidity of 55%

[0051] Condition 4 (severe condition): conditioning for the following period after exposure for 48 hours at a temperature of 30°C and a relative humidity of 75%

[0052] The moisture absorption rate was obtained as an average of results of "60" sticks in each of the example and the comparative example, and the results thereof are shown in Table 3 below. A moisture increase rate refers to an amount of an increase in a moisture absorption amount when conditioning is performed after exposure to the severe condition in comparison to when conditioning is performed under the room temperature condition.

[Table 3]

Classification	Condition	Moisture absorption rate (%) of smoking article		
		Average	Standard deviation	Moisture increase rate
Comparative Example	Conditioning for 7 days under Condition 3	9.5	0.1	-
	Conditioning for 7 days under Condition 4	17	0.7	8.5
Example	Conditioning for 4 days under Condition 3	9.3	0.1	-
	Conditioning for 1 day under Condition 4	9.4	0.1	0.1
	Conditioning for 2 days under Condition 4	9.7	0.2	0.4
	Conditioning for 3 days under Condition 4	10.0	0.3	0.7
	Conditioning for 4 days under Condition 4	12.0	0.4	2.7

[0053] Under Condition 3, a moisture absorption amount of the smoking article of the example was 9.3% on average. However, when conditioning was performed for 1 day, 2, 3, and 4 days after exposure to Condition 4, moisture absorption amounts of the smoking article were 9.4%, 9.7%, 10.0%, and 12.0%, respectively. In other words, moisture increase rates corresponding to exposure to the severe condition and conditioning were 0.1%, 0.4%, 0.7%, and 2.7%, respectively,

in comparison to conditioning under the room temperature condition.

[0054] In addition, in the comparative example, the moisture content was 17% when conditioning was performed for 7 days under Condition 4, and a moisture increase rate of 8.5% is shown in comparison to conditioning under the room temperature condition.

[0055] Thus, it can be found that the smoking article packaging of the example may more uniformly maintain the moisture content of the smoking article.

4. Comparison of Moisture Absorption Rate of Smoking Article Packaging

[0056] Comparing the results between the example and the comparative example as shown in Table 3 above, it can be predicted that when the smoking article packaging of the example is used, the moisture absorption rate is increased in comparison to a smoking article packaging of the comparative example.

[0057] From the above experimental results, it is predicted that when a smoking article packaging is manufactured using paper for controlling moisture in a smoking article described in the claims of the present disclosure, a smoking article that prevents a smoker from feeling hot by maintaining a uniform moisture content of the smoking article may be provided.

[0058] While the embodiments are described with reference to the drawing, 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.

[0059] Therefore, other implementations, other embodiments, and equivalents to the claims are also within the scope of the following claims.

Claims

1. Paper for controlling moisture in a smoking article, the paper comprising uncoated paper, and having a basis weight of 220 grams per square meter (g/m²) to 260 g/m² and a thickness of 280 micrometers (μm) to 320 μm.
2. The paper for controlling moisture in the smoking article of claim 1, wherein the paper for controlling moisture in the smoking article has a moisture content of 3% to 5%.
3. The paper for controlling moisture in the smoking article of claim 1, wherein the paper for controlling moisture in the smoking article has a Cobb sizing degree of 340 cubic centimeters per square meter (cc/m²) to 360 cc/m² (based on a Cobb test for 20 seconds).
4. The paper for controlling moisture in the smoking article of claim 1, wherein the paper for controlling moisture in the smoking article has a wet tensile strength of 2 kilonewtons per meter (kN/m) or greater.
5. The paper for controlling moisture in the smoking article of claim 1, wherein the paper for controlling moisture in the smoking article has a stiffness of 45 gram-force centimeters (gf-cm) or greater in a machine direction (MD) and 25 gf-cm or greater in a cross direction (CD).
6. The paper for controlling moisture in the smoking article of claim 1, wherein the paper for controlling moisture in the smoking article has a roughness of 1.4 μm or less.
7. The paper for controlling moisture in the smoking article of claim 1, wherein the paper for controlling moisture in the smoking article has a gloss of 40% or greater.
8. The paper for controlling moisture in the smoking article of claim 1, wherein the paper for controlling moisture in the smoking article is used as a smoking article packaging.
9. A smoking article package including a smoking article, and a smoking article packaging,

wherein the smoking article packaging comprises paper for controlling moisture in a smoking article, and wherein the paper for controlling moisture in the smoking article comprises uncoated paper, and has a basis

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weight of 220 grams per square meter (g/m^2) to 260 g/m^2 and a thickness of 280 micrometers (μm) to 320 μm .

10. The smoking article package of claim 9, wherein a moisture absorption rate of the smoking article under a condition of a temperature of 22°C and a relative humidity (%) of 55% is 9% or greater and less than 9.5%.

11. The smoking article package of claim 9, wherein a moisture absorption rate when conditioning is performed for four days under a condition of a temperature of 30°C and a relative humidity (%) of 75% is increased by 0.1% to 4%, in comparison to a moisture absorption rate when conditioning is performed for four days under a condition of a temperature of 22°C and a relative humidity (%) of 55%.

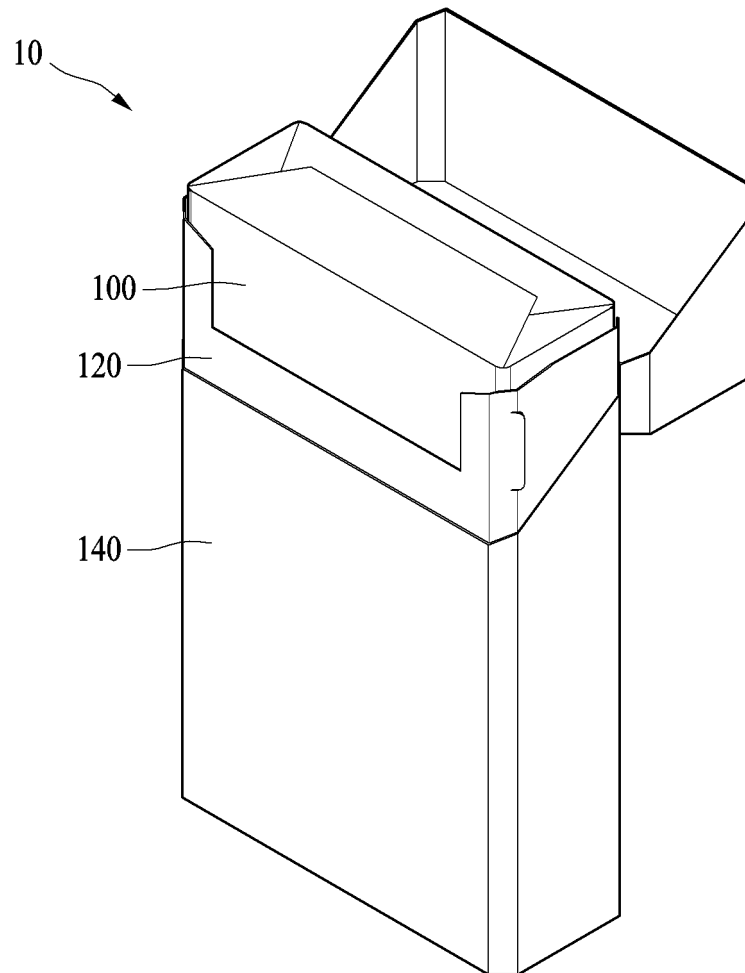


FIG. 1

INTERNATIONAL SEARCH REPORT

International application No.

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A. CLASSIFICATION OF SUBJECT MATTER**D21H 27/00**(2006.01)i; **D21H 27/10**(2006.01)i; **D21H 21/14**(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)

D21H 27/00(2006.01); A24D 3/00(2006.01); A24F 25/02(2006.01); D21H 17/25(2006.01); D21H 17/33(2006.01);
D21H 17/63(2006.01); D21H 17/68(2006.01); D21H 21/22(2006.01); D21H 27/10(2006.01); D21H 27/30(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: 평량(basis weight), 두께(thickness), 수분 제어(moisture control), 비코팅(uncoated), 담배(cigarette), 포장(package)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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A	KR 10-2020-0015891 A (STORA ENSO OYJ) 13 February 2020 (2020-02-13) See entire document.	1-11
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☐ Further documents are listed in the continuation of Box C.
 ☒ See patent family annex.

* Special categories of cited documents:	"I" 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
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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	

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

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

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