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(54) **SMOKING ARTICLE**

RAUCHARTIKEL

ARTICLE À FUMER

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(56) References cited:
EP-A1- 0 432 927
EP-A2- 0 375 844
WO-A2-2007/093852
US-A- 4 964 427
US-A- 5 129 408
US-A- 5 462 073
US-A- 5 617 881
US-A1- 2010 154 808

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Description

Field

[0001] The invention relates to a low ignition propensity smoking article comprising a wrapped rod of smokeable material.

Background

[0002] As used herein, the term "smoking article" includes smokeable products such as cigarettes, cigars and cigarillos whether based on tobacco, tobacco derivatives, expanded tobacco, reconstituted tobacco or tobacco substitutes and also heat-not-burn products.

[0003] Low ignition propensity (LIP) cigarettes have previously been manufactured by providing circumferential bands of burn suppressant in specifically developed cigarette papers. The bands of burn suppressant are designed to inhibit the burn rate of the tobacco rod and to cause the cigarette to self-extinguish unless a smoker regularly draws on the filter.

[0004] ASTM E2187-04 specifies a standardized test against which the ignition propensity properties of smoking articles can be assessed. National regulation often requires that low ignition propensity smoking articles comply with specific requirements when tested in accordance with ASTM E2187-04. For example, when tested in accordance with ASTM E2187-04, national regulation may require that at least 75% of a test sample of forty LIP smoking articles self-extinguish before burning to the end of the tobacco rod.

[0005] The development of specific LIP cigarette papers with bands of burn suppressant has allowed the tobacco industry to produce cigarettes which comply with regulatory requirements for LIP smoking articles in accordance with ASTM E2187-04.

[0006] The manufacture of cigarette papers incorporating bands of burn suppressant has involved applying the bands of burn suppressant to a pre-formed base paper to create the LIP cigarette paper. The burn suppressant application process generally takes place separately from cigarette assembly and requires specialised equipment for applying the burn suppressant to the base paper. The use of a burn suppressant also adds expense to the overall cigarette production process.

[0007] United States patent number 5,129,408 discloses a cigarette in which smokeable filler material is wrapped or contained in a processed tobacco sheet. The smokeable material wrapped in the processed tobacco sheet is in turn wrapped in a single layer of circumscribing outer wrapper material.

Summary

[0008] In accordance with the invention, there is provided a low ignition propensity smoking article comprising a rod of smokeable material, an inner wrapper comprising reconstituted tobacco material wrapped around the smokeable material and an outer wrapper wrapped around the smokeable material and the inner wrapper.

[0009] The inner and outer wrappers may not comprise bands of burn suppressant material.

[0010] The circumference of the smoking article may be between 15mm and 22mm.

[0011] The circumference of the smoking article may be between 15mm and 19mm.

[0012] The circumference of the smoking article may be between 15mm and 17mm.

[0013] The circumference of the smoking article may be between 16.9mm and 17.0mm.

[0014] The circumference of the smoking article may be between 20.5mm and 21.5mm.

[0015] The length of the smoking article may be between 80mm and 120mm.

[0016] The length of the smoking article may be between 82mm and 84mm.

[0017] The permeability of the inner wrapper may be 40 CU or less.

[0018] The permeability of the inner wrapper may be 25 CU or less.

[0019] The permeability of the inner wrapper may be 15 CU or less.

[0020] The permeability of the inner wrapper may be 10 CU or less.

[0021] The permeability of the outer wrapper may be between 25 and 100 CU.

[0022] The permeability of the outer wrapper may be between 70 and 100 CU.

[0023] The inner wrapper may be reconstituted tobacco material, such as reconstituted tobacco sheet.

[0024] The outer wrapper may be a low sidestream cigarette paper.

[0025] The smoking article may be a cigarette comprising a filter, a smokeable material rod and a tipping paper overlapping the filter and the rod to axially join the rod and the filter together.

[0026] In an LIP test according to ASTM E2187-04 carried out on a plurality, for example forty, of the cigarettes, at least 75% of the cigarettes self extinguish before the burning end of the rod reaches the tipping paper.

[0027] In accordance with the invention, there is also provided a method of forming a low ignition propensity smoking

article comprising wrapping an inner wrapper comprising reconstituted tobacco material around a rod of smokeable material and wrapping an outer wrapper around the rod of smokeable material and the inner wrapper.

[0028] For the purposes of example only, embodiments of the invention are described below with reference to the accompanying drawings, in which:

Brief Description of the Drawings

[0029]

Figure 1 is a perspective illustration of a low ignition propensity smoking article comprising a rod of smokeable material wrapped in first and second wrappers;

figure 2 is a perspective illustration of a part-assembled rod of smokeable material for a low ignition propensity smoking article. The rod comprises a tobacco core wrapped in an inner wrapper and partially wrapped in an outer wrapper; and

figure 3 is an illustration of an end face of a rod of smokeable material having a core of smokeable material, an inner wrapper wrapped around the core of smokeable material and an outer wrapper wrapped around the inner wrapper.

Detailed Description

[0030] An example of a low ignition propensity (LIP) smoking article 1 is shown in Figure 1.

[0031] The smoking article 1 shown in Figure 1 comprises an LIP cigarette 1 having a filter 2 and a rod 3 of smokeable material such as tobacco. The smoking article 1 may however comprise another type of smoking article such as one of those referred to above.

[0032] The filter 2 and the rod 3 are coaxially joined together by a sheet of overlapping tipping paper 4, which is secured around the external surfaces of the rod 3 and the filter 2 in a conventional manner in order to secure the two together. The dotted line in Figure 1 indicates the location of the abutting end faces of the filter 2 and the rod 3, overlapped by the tipping paper 4.

[0033] If a plurality of the smoking articles 1, for example forty, are tested in accordance with ASTM E2187-04, 75% or more of the plurality of smoking articles 1 self-extinguish before the burning end of the smokeable material rod 3 reaches the tipping paper 4. Therefore, 25% or less of the plurality of smoking articles burn the full length of the smokeable material rod.

[0034] The filter 2 may be substantially cylindrical in shape with a conventional construction. For example, a substantially cylindrical plug of filter material comprising cellulose acetate tow may be wrapped in a sheet of plug wrap around its circumferential surface. Any type of filter 2 could be used, including for example more complex filters 2 comprising carbon and/or one or more flavourant materials for flavouring a gaseous flow inside the filter 2. The filter 2 may be vented by vent channels formed using laser or electrostatic perforation techniques. The vent channels may provide an overall vent percentage of between 20% and 80%, preferably between 50% and 70%.

[0035] The rod 3 may also be substantially cylindrical in shape, with an external diameter substantially equal to the external diameter of the filter 2. Referring to Figure 2, the rod 3 comprises a substantially cylindrical core of packed tobacco material 7 wrapped in a first wrapper 8 and a second wrapper 9. The tobacco material 7 may comprise a blend of shredded tobacco, and may also include reconstituted tobacco material. In the examples discussed below, the first wrapper 8 is positioned inwardly of the second wrapper 9 and as such is closer to the core of tobacco material 7. The first wrapper 8 will therefore be referred to herein as the inner wrapper 8. The second wrapper 9 is positioned outwardly of the first wrapper 8 and will be referred to herein as the outer wrapper 9. The outer wrapper 9 may form the external surface of the rod 3, with the inner wrapper 8 positioned between the outer surface of the core of tobacco material 7 and the inner surface of the outer wrapper 9.

[0036] The inner wrapper 8 is a sheet wrapping material comprising reconstituted tobacco material, and may be configured to impart desirable and varied flavour and sensing characteristics to the smoking article. For example, the inner wrapper 8 may comprise or consist of reconstituted tobacco sheet, which may in turn comprise or consist of one or more types of reconstituted tobacco material. The reconstituted sheet can comprise a range of different tobacco types selected to improve the transmission of tobacco tastes and flavours to a smoker of the cigarette. For example, the reconstituted material can comprise one or more of sun-cured tobacco, dark air-cured tobacco, fire-cured tobacco or any other suitable tobacco type. The permeability of the inner wrapper 8 may be in a range between 5 Coresta (CU) and 50 Coresta, preferably between 17 Coresta and 38 Coresta. The one-ply thickness of the inner wrapper 8 may be any value in a range of between approximately 85 microns and approximately 121 microns. The dry basis weight of the inner wrapper 8 may be any value between approximately 35 g/m^2 and approximately 45 g/m^2. The diffusivity of the inner wrapper 8 may be any value between approximately 0.8 cm/s and approximately 2.8 cm/s.

[0037] Examples of three specific inner wrappers 8 that can be used are given in Table 1 below. All of the inner

wrappers 8 shown in Table 1 are sheets of reconstituted tobacco material.

Table 1

Inner Wrapper	1		2		3	
	Value	S.D.	Value	S.D.	Value	S.D.
Diffusivity (cm/s)	0.973	0.1407	1.139	0.1735	2.657	0.5575
Grammage (gsm)	43.8	0.51	43.3	0.10	42.5	0.12
Width (mm)	18.587	0.0540	18.594	0.0471	16.180	0.0354
Strain	0.89		1.11		0.83	
Tensile Strength (N/15mm)	9.7		9.1		7.6	
Permeability (CU)	37.5	12.12	17.9	4.93	26.7	6.18
Thickness (μm)	102	13.4	106	14.4	109	11.2

[0038] As is shown in Figure 2, the inner wrapper 8 may extend around the circumferential surface of the core of tobacco material 7. For example, referring to Figures 2 and 3, the inner wrapper 8 may extend fully around the circumference of the core 7 and fully along the axial length of the rod 3. The inner wrapper 8 may thereby cover substantially the whole of the circumferential surface of the core 7. Alternatively, the inner wrapper 8 may extend partially around the circumference of the core 7 and/or partially along the length of the rod 3. The inner wrapper 8 may therefore comprise a patch underneath a full length outer wrapper 9. The end faces of the core 7 are left open to allow a gaseous flow to enter and exit the rod 3 at its distal and filter ends respectively.

[0039] The outer wrapper 9 is also a sheet wrapping material, for example comprising or consisting of a cigarette paper or low sidestream (LSS) cigarette paper. Alternatively, the outer wrapper 9 may comprise or consist of a plurality of types of cigarette paper and/or LSS cigarette paper.

[0040] The dry basis weight of the outer wrapper 9 may be any value between approximately 28 g/m^2 and approximately 40 g/m^2, with between approximately 16.0 g/m^2 and approximately 32.0 g/m^2 of fibre, between approximately 0.3 g/m^2 and approximately 2.0 g/m^2 of K_3 citrate, between 0 g/m^2 and approximately 2 g/m^2 of MgO and between approximately 4 g/m^2 and approximately 11 g/m^2 of $CaCO_3$. Other ranges can be used. The amount of total filler in the outer wrapper 9 may be any value between approximately 6 g/m^2 and 10 g/m^2, which is a total filler percentage by weight of between approximately 15% and 40%. Other ranges can be used.

[0041] The permeability of the outer wrapper 9 may be any value between approximately 25 Coresta and approximately 100 Coresta. Within this range, the permeability of a cigarette paper may be approximately 25 Coresta, whilst the permeability of a LSS cigarette paper may be between approximately 70 Coresta and approximately 100 Coresta. The diffusivity of the outer wrapper 9 may be any value between approximately 0.30 cm/s and approximately 0.50 cm/s.

[0042] Examples of three specific outer wrappers 9 are given in Table 2 below. Example 1 is a cigarette paper, whilst examples LSS 1 and LSS 2 are low sidestream cigarette papers. LSS 1 is ventilated by electroperforation (EP) and has a permeability of 70 Coresta units. LSS 2 is also ventilated by electroperforation and has a permeability of 100 Coresta units.

Table 2

Outer Wrapper	1	LSS 1 EP70	LSS 2 EP100
Basis Weight Total Dry (g/m^2)	28 (100%)	40 (100%)	40 (100%)
Fibre (g/m^2)	16.8 (60%)	31.5 (78.75%)	31.5 (78.75%)
K_3 Citrate (g/m^2)	0.3 (1%)	2 (5%)	2 (5%)
MgO (g/m^2)	-	2 (5%)	2 (5%)
$CaCO_3$ (g/m^2)	10.9 (39%)	4.5 (11.25%)	4.5 (11.25%)
Total Filler (g/m^2)	10.9 (39%)	6.5 (16.25%)	6.5 (16.25%)
Diffusivity (cm/s)	0.392	0.447	0.447

[0043] The outer wrapper 9 may extend around the outer circumferential surface of the inner wrapper 8. For example,

as shown in Figures 1 to 3, the outer wrapper 9 may extend fully around the outer circumference of the inner wrapper 8 and fully along the axial length of the rod 3, thereby covering substantially the whole of the outer circumferential surface of the inner wrapper 8. In this manner, the outer wrapper 9 encloses both the inner wrapper 8 and the core of tobacco material 7. The end faces of the rod 3 are left open to allow a gaseous flow to pass axially through the rod 3. In the examples shown in Figures 1 to 3, the outer surface of the outer wrapper 9 forms the outer surface of the rod 3 to which the tipping paper 4 is adhered at the filter end.

[0044] In terms of dimensions, the cigarette 1 can have an external circumference of approximately 16.96mm and an overall length (pre-smoking) of approximately 83mm. The length of the rod 3 (pre-smoking) can be approximately 56mm and the length of the filter 2 can be approximately 27mm. It will be appreciated that these dimensions can be varied. For example, the external circumference of the cigarette 1 may be any value between 15mm and 22mm, whilst the overall length of the cigarette 1 may be any value between 80mm and 120mm. The external circumference may, for example be approximately 21mm. The overall length of the cigarette 1 can be varied by increasing/decreasing the length of either or both of the rod 3 and the filter 2.

[0045] The cigarette 1 does not comprise a specifically developed LIP cigarette paper having bands of burn suppressant designed to limit the burn rate of the rod 3. Manufacture of the cigarette 1 therefore does not require the pre-production of a specifically developed banded LIP cigarette paper, and accordingly does not require the specialised equipment necessary for applying burn suppressant to cigarette paper.

[0046] Ignition propensity tests carried out on samples of forty cigarettes 1 show that significantly less than 25% of the cigarettes 1 burn down to the tipping paper 4 when tested in accordance with ASTM E2187-04. For example, Table 3 below illustrates the ignition propensity of six different sample cigarettes 1 in accordance with the invention (Samples 1-6). For each sample cigarette (1-6), forty cigarettes were tested in accordance with ASTM 2187-04. The rightmost column of Table 3 indicates the percentage of cigarettes which did not self-extinguish before the burning end of the smokeable material rod 3 reached the tipping paper 4.

Table 3

Cigarette	Inner Wrapper	Outer Wrapper	% of cigarettes exhibiting full length burn of tobacco rod
Sample 1	1	1	2.5
Sample 2	1	LSS 1	5
Sample 3	1	LSS 2	12.5
Sample 4	3	1	0
Sample 5	3	LSS 1	7.5
Sample 6	3	LSS 2	2.5

[0047] The cigarette 1 therefore has LIP properties that are comparable to cigarettes incorporating specifically developed LIP papers, but can be produced without the requirement to manufacture the LIP papers.

[0048] The cigarette 1 has a relatively high puff number compared to single wrapped cigarettes. For example, when smoked under ISO standard conditions, the cigarette 1 may have an average puff number of approximately 7.5 compared to an average puff number of approximately 6.5 for a control, single wrapped cigarette wrapped in outer wrapper #1 (see Table 2 above).

[0049] The diffusivity of the combination of the inner wrapper 8 and the outer wrapper 9 of the cigarette 1 is comparable to the diffusivity of specifically developed LIP cigarette papers with bands of burn suppressant. The diffusivity value for the combination of inner and outer wrappers 8, 9 may be any value in a range of between 0.080 cm/s and 0.095 cm/s.

[0050] The cigarette 1 exhibits low sidestream smoke compared to control cigarettes manufactured with commercially available materials.

[0051] For example, Table 4 below illustrates sidestream smoke chemistry results for the six example cigarettes 1 listed in Table 3 (Samples 1-6). Also illustrated in Table 4 are sidestream smoke chemistry results for two control, single-wrapped cigarettes. The tobacco density of all of the cigarettes in Table 4 is 263 g/cm^3 at 13.5% moisture. The tobacco blend used in the tobacco rod 3 is the same for all of the cigarettes other than Control #1, in which a different blend was used.

Table 4

Cigarette	Inner wrapper	Outer wrapper	NFDPM (mg/cig)	Nicotine (mg/cig)	CO (mg/cig)	CO_2 (mg/cig)	Total (mg/cig)
Control 1	-	1	14.0	2.49	28.3	235.7	280.5
Control 2	-	1	12.9	2.56	28.3	228.6	272.5
Sample 1	1	1	8.9	1.29	28.5	237.6	276.3
Sample 2	1	LSS 1	5.7	0.87	27.2	265.8	299.5
Sample 3	1	LSS 2	6.7	1.15	28.9	265.4	302.1
Sample 4	3	1	9.4	1.43	27.7	241.2	279.7
Sample 5	3	LSS 1	6.2	0.89	29.7	276.3	313.2
Sample 6	3	LSS 2	6.5	1.07	29.5	269.0	306.1

[0052] As can be seen from Table 4, the sidestream Nicotine Free Dry Particulate Matter (NFDPM) and sidestream Nicotine is significantly reduced compared to the control cigarettes.

[0053] The visible sidestream produced by cigarettes 1 in accordance with the invention is also reduced as compared to control cigarettes manufactured with commercially available materials. For example, the cigarettes 1 may emit approximately 40% to 60% less visible sidestream smoke than a control cigarette which is single-wrapped in outer wrapper #1 (see Table 2 above). The amount of visible side stream smoke is least when the outer wrapper 9 comprises an LSS cigarette paper. Either of the LSS papers described above can be used.

[0054] The reduction in visible sidestream smoke can be calculated by comparing a photograph of a burning control cigarette with a corresponding photograph of a burning cigarette 1 in accordance with the invention, and counting the difference between the number of pixels in the two photographs representing sidestream smoke..

[0055] Table 5 illustrates the visible sidestream smoke from three examples of the cigarette 1 (Samples 4-6), together with the visible sidestream smoke from a control, single-wrapped cigarette (Control 2). The sidestream smoke reductions are calculated using the photographic method explained above, with each measurement being taken at an equivalent burn length percentage of the rod 3. The filter, tobacco density and tobacco blend used in the rod 3 is the same for all cigarettes listed in Table 5. The tobacco density is 263 g/cm^3 at 13.5% moisture.

Table 5

Cigarette	Inner Wrapper	Outer Wrapper	Pixels representing visible sidestream	Reduction (%) in pixels versus Control
Control 2	-	1	985,741	-
Sample 4	3	1	505,735	49
Sample 5	3	LSS 1	434,001	56
Sample 6	3	LSS 2	475,311	52

[0056] An example method of manufacturing the cigarette 1 will now be briefly described. Beginning with the filter 2, as is known in the field, a plug of filter material can be formed by feeding a substantially continuous flow of cellulose acetate tow into a funnel to provide a generally cylindrical body of cellulose acetate material. The cellulose acetate material can be passed through a garniture that attaches the plugwrap to the filter material from a plugwrap reel. The resulting wrapped filter material can subsequently be cut into individual segments for use in making the filter 2. The cut length may be suitable for producing two cigarettes 1 in tandem or individual cigarettes 1, as required. Also, the cutting may be carried out as a multistage process in which lengths of filter material for use with multiple cigarettes 2 are cut initially, and are then later cut into lengths suitable for use in manufacturing cigarettes 1 in tandem or individually.

[0057] Assembly of the cigarette 1 can be carried out using a suitable rod maker fitted with a tipping unit. The inner wrapper 8 and outer wrapper 9 can be provided as bobbins with lengths of approximately 2500m and widths of 16.2mm. Alternative widths can be 15.8mm, 18.5mm, 20.0mm or 23mm, depending on the desired cigarette circumference. The wrappers 8, 9 are pulled from bobbin carriers located next to the rod maker and guided simultaneously to a garniture by a series of rollers and a paper guide for assembly of the cigarette. Inner wrapper 8 from the inner wrapper bobbin is wrapped around a column of smokeable material, and concurrently wrapped with outer wrapper 9 from the outer wrapper

bobbin. The relative positions of the inner 8 and outer 9 wrappers can be adjusted in the rod maker in order to adjust the size of an overlap seam for each wrapper 8, 9.

[0058] As an alternative, assembly of the cigarette 1 can comprise cutting patches of the inner wrapper 8 and applying the patches 8 to an internal surface of the outer wrapper 9 in a gluing process. The combination of the outer wrapper 9 and patches 8 can then be fed to a garniture for wrapping around a smokeable material column.

[0059] The alternatives described above can be used singly or in combination to achieve the effects of the invention. It will be appreciated that the cigarette 1 could alternatively comprise another type of smoking article such as a cigar or a cigarillo.

Claims

1. A low ignition propensity smoking article (1) comprising
a rod of smokeable material (3);
an inner wrapper (8) comprising reconstituted tobacco material wrapped around the smokeable material, the inner wrapper having a permeability of between 5 and 50 CORESTA; and
an outer wrapper (9) wrapped around the smokeable material and the inner wrapper, the outer wrapper having a permeability of between 25 and 100 CORESTA.

2. A smoking article according to any preceding claim, wherein the inner and outer wrappers do not comprise bands of burn suppressant.

3. A smoking article according to any preceding claim, wherein the circumference of the smoking article is between 15mm and 17mm.

4. A smoking article according to any preceding claim, wherein the circumference of the smoking article is between 16.9mm and 17.0mm.

5. A smoking article according to any one of claims 1 to 3, wherein the circumference of the smoking article is between 20.5mm and 21.5mm.

6. A smoking article according to any preceding claim, wherein the length of the smoking article is between 80mm and 120mm.

7. A smoking article according to any one of claims 1 to 5, wherein the length of the smoking article is between 82mm and 84mm.

8. A smoking article according to any preceding claim, wherein the permeability of the inner wrapper is 40 CU or less.

9. A smoking article according to any one of claims 1 to 7, wherein the permeability of the inner wrapper is 25 CU or less.

10. A smoking article according to any one of claims 1 to 7, wherein the permeability of the inner wrapper is 15 CU or less.

11. A smoking article according to any preceding claim, wherein the permeability of the outer wrapper is between 70 and 100 CU.

12. A smoking article according to any preceding claim, wherein the inner wrapper is reconstituted tobacco paper.

13. A smoking article according to any preceding claim, wherein the outer wrapper is low sidestream cigarette paper.

14. A smoking article according to any preceding claim, wherein the smoking article is a cigarette.

15. A method of forming a low ignition propensity smoking article comprising
wrapping an inner wrapper (8) comprising reconstituted tobacco material around a rod of smokeable material, the inner wrapper having a permeability of between 5 and 50 CORESTA; and
wrapping an outer wrapper (9) around the rod of smokeable material and the inner wrapper, the outer wrapper having a permeability of between 25 and 100 CORESTA.

Patentansprüche

1. Rauchartikel (1) mit geringem Zündpotenzial, der Folgendes umfasst:

   einen Stab (3) aus rauchbarem Material,
   eine Innenhülle (8), die rekonstituiertes Tabakmaterial umfasst und um das rauchbare Material herum gewickelt ist, wobei die Innenhülle eine Permeabilität zwischen 5 und 50 CORESTA aufweist; und
   eine Außenhülle (9), die um das rauchbare Material und die Innenhülle herum gewickelt ist, wobei die Außenhülle eine Permeabilität zwischen 25 und 100 CORESTA aufweist.

2. Rauchartikel nach einem vorhergehenden Anspruch, wobei die Innenhülle und die Außenhülle keine Brennhemmerstreifen umfassen.

3. Rauchartikel nach einem vorhergehenden Anspruch, wobei der Umfang des Rauchartikels zwischen 15 mm und 17 mm liegt.

4. Rauchartikel nach einem vorhergehenden Anspruch, wobei der Umfang des Rauchartikels zwischen 16,9 mm und 17,0 mm liegt.

5. Rauchartikel nach einem der Ansprüche 1 bis 3, wobei der Umfang des Rauchartikels zwischen 20,5 mm und 21,5 mm liegt.

6. Rauchartikel nach einem vorhergehenden Anspruch, wobei die Länge des Rauchartikels zwischen 80 mm und 120 mm liegt.

7. Rauchartikel nach einem der Ansprüche 1 bis 5, wobei die Länge des Rauchartikels zwischen 82 mm und 84 mm liegt.

8. Rauchartikel nach einem vorhergehenden Anspruch, wobei die Permeabilität der Innenhülle 40 CU oder weniger beträgt.

9. Rauchartikel nach einem der Ansprüche 1 bis 7, wobei die Permeabilität der Innenhülle 25 CU oder weniger beträgt.

10. Rauchartikel nach einem der Ansprüche 1 bis 7, wobei die Permeabilität der Innenhülle 15 CU oder weniger beträgt.

11. Rauchartikel nach einem vorhergehenden Anspruch, wobei die Permeabilität der Außenhülle zwischen 70 und 100 CU liegt.

12. Rauchartikel nach einem vorhergehenden Anspruch, wobei die Innenhülle rekonstituiertes Tabakpapier ist.

13. Rauchartikel nach einem vorhergehenden Anspruch, wobei die Außenhülle Zigarettenpapier mit geringem Seitenstrom ist.

14. Rauchartikel nach einem vorhergehenden Anspruch, wobei der Rauchartikel eine Zigarette ist.

15. Verfahren zum Herstellen eines Rauchartikels mit geringem Zündpotenzial, das Folgendes umfasst:

    Wickeln einer Innenhülle (8), die rekonstituiertes Tabakmaterial umfasst, um einen Stab aus rauchbarem Material, wobei die Innenhülle eine Permeabilität zwischen 5 und 50 CORESTA aufweist; und
    Wickeln einer Außenhülle (9) um den Stab aus rauchbarem Material und die Innenhülle, wobei die Außenhülle eine Permeabilität zwischen 25 und 100 CORESTA aufweist.

Revendications

1. Article à fumer à faible tendance à l'inflammation (1), comprenant :

   une tige de matériau fumable (3) ;
   une enveloppe interne (8), comprenant un matériau à base de tabac reconstitué, enroulée autour du matériau

fumable, l'enveloppe interne ayant une perméabilité dans la plage de 5 à 50 unités CORESTA ; et
une enveloppe externe (9) enroulée autour du matériau fumable et de l'enveloppe interne, l'enveloppe externe ayant une perméabilité dans la plage de 25 à 100 unités CORESTA.

2. Article à fumer selon l'une quelconque des revendications précédentes, dans lequel les enveloppes interne et externe ne comprennent pas de bandes d'inhibiteur de combustion.

3. Article à fumer selon l'une quelconque des revendications précédentes, dans lequel la circonférence de l'article à fumer se situe dans la plage de 15 mm à 17 mm.

4. Article à fumer selon l'une quelconque des revendications précédentes, dans lequel la circonférence de l'article à fumer se situe dans la plage de 16,9 mm à 17,0 mm.

5. Article à fumer selon l'une quelconque des revendications 1 à 3, dans lequel la circonférence de l'article à fumer se situe dans la plage de 20,5 mm à 21,5 mm.

6. Article à fumer selon l'une quelconque des revendications précédentes, dans lequel la longueur de l'article à fumer se situe dans la plage de 80 mm à 120 mm.

7. Article à fumer selon l'une quelconque des revendications 1 à 5, dans lequel la longueur de l'article à fumer se situe dans la plage de 82 mm à 84 mm.

8. Article à fumer selon l'une quelconque des revendications précédentes, dans lequel la perméabilité de l'enveloppe interne est de 40 unités CU ou moins.

9. Article à fumer selon l'une quelconque des revendications 1 à 7, dans lequel la perméabilité de l'enveloppe interne est de 25 unités CU ou moins.

10. Article à fumer selon l'une quelconque des revendications 1 à 7, dans lequel la perméabilité de l'enveloppe interne est de 15 unités CU ou moins.

11. Article à fumer selon l'une quelconque des revendications précédentes, dans lequel la perméabilité de l'enveloppe externe se situe dans la plage de 70 à 100 unités CU.

12. Article à fumer selon l'une quelconque des revendications précédentes, dans lequel l'enveloppe interne est en papier de tabac reconstitué.

13. Article à fumer selon l'une quelconque des revendications précédentes, dans lequel l'enveloppe externe est en papier à cigarettes à faible dégagement de fumée latéral.

14. Article à fumer selon l'une quelconque des revendications précédentes, dans lequel l'article à fumer est une cigarette.

15. Procédé de formation d'un article à fumer à faible tendance à l'inflammation, comprenant les étapes consistant à :

enrouler une enveloppe interne (8) comprenant un matériau à base de tabac reconstitué autour d'une tige de matériau fumable, l'enveloppe interne ayant une perméabilité dans la plage de 5 à 50 unités CORESTA ; et
enrouler une enveloppe externe (9) autour de la tige de matériau fumable et de l'enveloppe interne, l'enveloppe externe ayant une perméabilité dans la plage de 25 à 100 unités CORESTA.

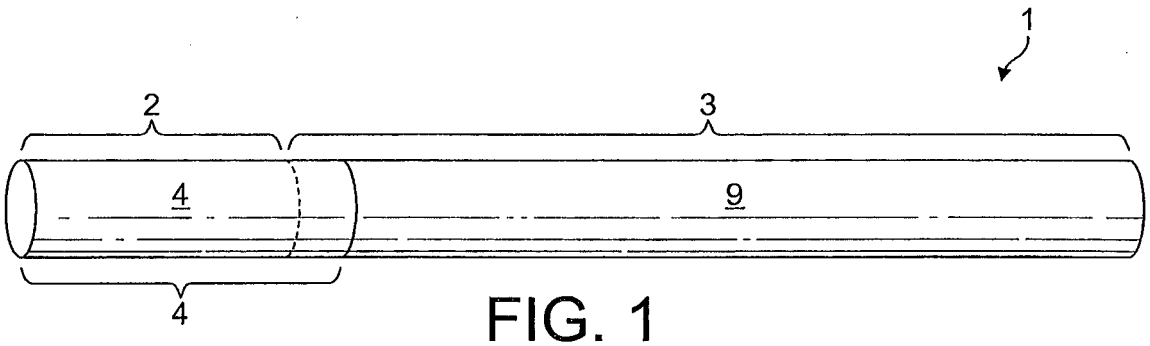

FIG. 1

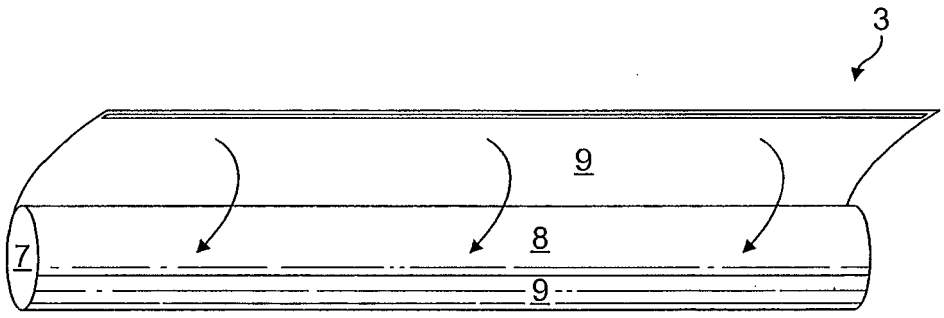

FIG. 2

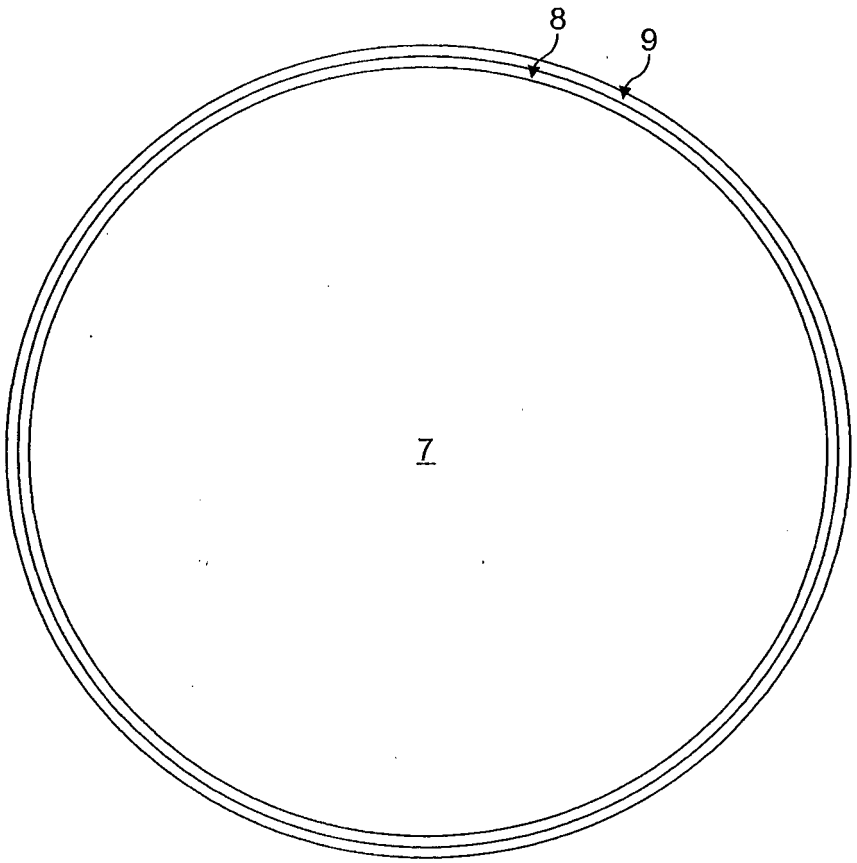

FIG. 3

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 5129408 A **[0007]**