

(19)



(11)

EP 3 880 010 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention of the grant of the patent:

03.05.2023 Bulletin 2023/18

(51) International Patent Classification (IPC):

A24D 3/02 ^(2006.01) **A24D 3/04** ^(2006.01)
A24D 3/06 ^(2006.01)

(21) Application number: **20816155.4**

(52) Cooperative Patent Classification (CPC):

A24D 3/0216; A24D 3/0225; A24D 3/0287;
A24D 3/048; A24D 3/061; A24D 3/10

(22) Date of filing: **27.11.2020**

(86) International application number:

PCT/EP2020/083731

(87) International publication number:

WO 2021/105427 (03.06.2021 Gazette 2021/22)

(54) **TOBACCO SMOKE FILTER**

TABAKRAUCHFILTER

FILTRE POUR FUMÉE DE TABAC

(84) Designated Contracting States:

AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

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(30) Priority: **29.11.2019 GB 201917410**
28.08.2020 GB 202013546

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(43) Date of publication of application:
22.09.2021 Bulletin 2021/38

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EP 3 880 010 B1

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Description

[0001] The present invention relates to tobacco smoke filters or filter elements for smoking articles such as cigarettes.

[0002] Tobacco smoke filters which include a frangible capsule, or a plurality of frangible capsules, embedded in the tobacco smoke filtering material are well-known. These capsules contain an additive (typically a liquid flavouring agent). The smoker applies pressure to the filter to break the capsule therein to release the flavouring agent. The smoker would usually break the capsule immediately prior to smoking, although they may choose to break it at any stage of the smoking process (or not at all). Such capsule filter products are consequently known as 'flavour-on-demand', indicating that the smoker chooses when, and if, he requires the release of flavour contained within the capsule.

[0003] Tobacco smoke filters which contain a central cavity, surrounded by tobacco smoke filtering material, have been previously described by the applicant e.g. Cavitec® filter. The central cavity is filled with one or more sepiolite granular additives (e.g. a flavourant) with high levels of additive loading. The cavity optimises the effect of the additive providing the user with a consistent flavour level and a cigarette that is always flavoured, including when the pack is first open. However, with these filters the smoker does not have a choice when (if at all) to release the flavour and there is no extra interactive or sensory experience.

[0004] EP2740370 and WO2016/016252 disclose tobacco smoke filters containing a capsule in a cavity. US2017/295842 discloses tobacco smoke filters containing flavourant particles in a cavity.

[0005] According to the present invention there is provided a tobacco smoke filter or filter element comprising: a longitudinally extending core which includes first and second longitudinally extending rods of tobacco smoke filtering material, wherein the first rod of tobacco smoke filtering material is distanced longitudinally from the second rod of tobacco smoke filtering material; a wrapper engaged around the first and second longitudinally extending rods such that the wrapper defines a cavity between the first and second rods of tobacco smoke filtering material wherein the wrapper is opaque with an opacity of 71% or more measured according to ISO 2471:2008 (Paper and board - Determination of opacity (paper backing) - Diffuse reflectance method) and a weight of 23 grams per square meter to 100 grams per square meter; and at least one receptacle for an additive located in the cavity, wherein the maximum width or diameter of the receptacle for an additive is less than half the maximum diameter of the cavity and the void space remaining in the cavity is greater than 50% of the volume of the cavity, the receptacle being free to move within the cavity.

[0006] The phrase "being free to move within the cavity" means the receptacle is not fixed or adhered (e.g. with adhesive) within the cavity and has sufficient space

to move in all directions (e.g. up, down, forward, back, left, right) in the cavity. When the filter element is moved or shaken the receptacle may move freely in any direction within the cavity. The movement of the receptacle is audible and palpable. It can be sensed (e.g. heard or felt as a vibration) by the user. Herein the term "audible" means within the accepted human hearing range for pitch (Hz) and loudness (dB) i.e. 20 to 20,000 Hz and 0 to 85 dB. Herein the term "palpable" means able to be touched or felt.

[0007] The applicants have found that tobacco smoke filter and filter elements of the invention may provide a unique and enhanced sensory experience for the smoker. Inclusion of a freely moving capsule or capsules within the cavity, capable of moving in all directions within the cavity, creates an audible and palpable rattle when the filter is moved, and an audible and palpable 'pop' when the capsule is broken. These features provide the smoker with both aural and haptic sensations for an enhanced sensory experience when smoking. The movement of the capsule or capsules in all directions within the cavity generates vibrations, the frequencies of which can vary depending on the number, size and composition of capsules as well as the length and circumference of the cavity and the weight, opacity and composition of the wrapper engaged around the cavity. The vibrational frequencies provide the smoker with a new and different feel compared with a conventional filter. The vibrational frequencies of the freely moving capsules may be in particular use in combating anti-counterfeiting, a major problem in the cigarette industry. The vibrational frequencies and audible rattle created by the free movement of the capsule or capsules within the cavity are distinctive and could help to deter counterfeiting of the brand.

[0008] The longitudinally extending core may be substantially cylindrical (including at least the first and second rods of tobacco smoke filtering material and the cavity therebetween). In other words the core is formed from two spaced rods of tobacco smoke filtering material, rather than a single rod of tobacco smoke filtering material. The first rod of tobacco smoke filtering material is distanced longitudinally from the second rod of tobacco smoke filtering material leaving a space therebetween. Preferably the space between the first rod of tobacco smoke filtering material and the second rod of tobacco smoke filtering material is of length 3.5 mm to 32 mm e.g. 3.5 to 26 mm, e.g. 4 to 22 mm, e.g. 5 to 21 mm, e.g. 7 to 14 mm. The first rod of tobacco smoke filtering material and the second rod of tobacco smoke filtering material may be of the same length or of different length.

[0009] The tobacco smoke filtering material of the first rod of tobacco smoke filtering material and the tobacco smoke filtering material of the second rod of tobacco smoke filtering material may be composed of the same or different filtering materials. Preferably the filtering materials are cellulose acetate (e.g. in the form of a crimped filamentary tow). However, cotton or plastics such as polyethylene or polypropylene, natural or synthetic staple

fibres, cotton wool, a web material such as paper (usually creped), an (e.g. synthetic) non-woven material, and/or an extruded material (e.g. starch, synthetic foams, extruded foams) are also acceptable. The filtering materials may comprise carbon (e.g. activated carbon) to reduce vapour phase and semi-volatile components in main-stream smoke without the need for ventilation. The filtering material may be cellulose acetate to which a plasticiser has been applied (e.g. plasticised filamentary tow). Triacetin is well known in the art and is typically applied to cellulose acetate filters as a plasticiser (e.g. at around 6-8% w/w).

[0010] The tobacco smoke filter or filter element comprises one or more receptacles for an additive. Herein the term "receptacle for an additive" refers to the, or each receptacle for an additive where there is more than one receptacle. Preferably the receptacle for an additive is a capsule (e.g. a frangible capsule). Preferably the receptacle for an additive (e.g. capsule e.g. frangible capsule) includes an additive in the form of a flavourant. The flavourant may be any flavourant known or suitable for use in a smoking article such as a cigarette, for example menthol, spearmint, peppermint, fenugreek, clove etc. The receptacle for an additive may be coloured to identify the flavourant enclosed (e.g. a green capsule for menthol). The receptacle for an additive may comprise more than one flavouring agent (and may provide blends of different flavours). When there is one or more receptacles for an additive the receptacles may contain the same flavourant, or different flavourants. In this example, the user is able to vary the amount of flavourant they receive, and when they receive it, by breaking the required number of receptacles e.g. the user may break one receptacle for an additive at the beginning of smoking and one receptacle for an additive during smoking, allowing the user to vary the smoking experience e.g. provide a boost of flavour during smoking.

[0011] The receptacle for an additive (e.g. a capsule e.g. a frangible capsule) and/or the tobacco smoke filtering material may contain one or more additives, for example a flavourant and/or a liquid, solid or other material, such as activated carbon, e.g. to aid smoke filtration. The receptacle for an additive and/or tobacco smoke filtering material may further contain stimulants, water, tobacco extracts, smoke altering chemicals and/or agents to promote degradation of the filter. The receptacle for an additive (e.g. capsule e.g. frangible capsule) may be of maximum width 2 to 5 mm, e.g. 2.5 to 4 mm, e.g. 2.5 to 3.9 mm, e.g. 3.0 to 3.8 mm, e.g. 3.2 to 3.7 mm, e.g. 3.35 or 3.5 mm. The maximum width herein refers to the measurement across the receptacle at its broadest point, so for a spherical capsule or substantially cylindrical capsule it refers to the diameter. The receptacle for an additive may include from 5 to 30 mg flavourant, e.g. 7 to 25 mg, e.g. 10 to 25 mg, e.g. 10 to 20 mg.

[0012] The receptacle for an additive (e.g. a capsule e.g. a frangible capsule) is freely moveable within the central cavity. This means that the receptacle for an ad-

ditive is not fixed or adhered (e.g. with adhesive) to the filter wrapper or the first and second rods of tobacco smoke filtering material. The maximum width or diameter (if spherical or substantially spherical) of the receptacle is less than half the maximum diameter of the cavity. The volume of the receptacle (e.g. the space the receptacle occupies) is such that the void space (e.g. the space the receptacle does not occupy) remaining in the cavity is greater than 50% of the volume of the cavity (e.g. 51 to 90 %, e.g. 55 to 80 % e.g. 60 to 75 %). The receptacle for an additive is therefore free to move in all directions (e.g. longitudinally and latitudinally) within the void space in the cavity and in doing so creates an audible and palpable rattle when the filter is moved or shaken. The receptacle for an additive is not visible (to the smoker) at the mouth or buccal end of the filter or filter element, or at the mouth end of a cigarette including a filter of this aspect of the invention.

[0013] The applicants have surprisingly found that positioning of a free moving capsule within the cavity supplies a greater yield of flavourant to the user compared to positioning of the capsule embedded (and immovably) within the tobacco smoke filtering material. The menthol yield in the smoke is higher when the crushed capsule is positioned within the cavity (and is free to move within the cavity) thus the smoker experiences increased flavour delivery.

[0014] The wrapper is engaged around the longitudinally extending core and engaged around the first and second rods of tobacco smoke filtering material and defines a cavity between the first and second rods of tobacco smoke filtering material. The closest ends (e.g. the facing ends) of the first and second rods of tobacco smoke filtering material, together with the internal surface of the wrapper define the cavity. At least one receptacle for an additive is freely located in the cavity. Preferably the cavity is of length 3.5 mm to 32 mm e.g. 3.5 to 25 mm, e.g. 4 to 22 mm, e.g. 5 to 21 mm, e.g. 7 to 14 mm. The cavity may be of circumference from 14 to 28 mm, e.g. 16 to 26 mm, e.g. 16 to 25 mm, e.g. 16 to 19 mm, e.g. 24 to 25 mm. The cavity may have a maximum diameter from 5 mm to 10 mm, e.g. 5.3 mm to 7.8 mm. It will be appreciated that the circumference and diameter of the cavity will be substantially the same as the circumference and diameter of the filter or filter element. The cavity may vary in position within the longitudinally extending core, for example the cavity may be substantially central within the longitudinally extending core or positioned towards one end of the longitudinally extending core.

[0015] Adhesive is applied to the wrapper in register with the plugs of tobacco smoke filtering material but not in register with the space between plugs. In other words, the region of the cavity is free of adhesive and only the first and second rods of tobacco smoke filtering material are adhered to the wrapper. This allows the capsule to move freely in the central cavity. The adhesive may be any conventional filter wrapper adhesive known in the

art and may be applied by methods well known in the art.

[0016] In a further example, the wrapper may be coloured (e.g. green) providing further visual differentiation from conventional filters. The colour of the wrapper (e.g. a green wrapper for menthol) may also be used to identify the flavour provided by the receptacle for an additive.

[0017] The wrapper may be a paper, e.g. plugwrap. The wrapper may be coated to minimise absorption of liquids released from the ruptured capsule, as is well-known in the art. The wrapper may be standard or porous depending on ventilation requirements. The wrapper may be air permeable filtering paper (e.g. corrugated air permeable filtering paper) or a wrapper of cellulose acetate (e.g. crimped air permeable cellulose acetate). The weight of the inner wrapper is from 23 grams per square meter to 100 grams per square meter, e.g. 80 grams per square meter. The wrapper may include a still further flavouring agent located thereon, which may be any flavouring agent known for use in tobacco smoke filters or filter elements (e.g. the flavouring agent may be menthol, spearmint, peppermint, nutmeg, cinnamon, clove, lemon, chocolate, peach, strawberry, vanilla etc.). The wrapper is opaque, with an opacity of 71% or more (e.g. 71% to 100%, e.g. 71% to 80%, e.g. 80% to 90%, e.g. 90% to 100%). Herein the term "opacity" means a value measured according to ISO 2471:2008 Paper and board - Determination of opacity (paper backing) - Diffuse reflectance method). The weight and opacity of the wrapper may influence the vibrational frequencies generated by the movement of the capsule or capsules in all directions within the cavity. Further the weight and opacity of the wrapper may affect the aural and haptic sensations experienced by the user when the filter or filter element is moved or shaken.

[0018] The tobacco smoke filter or filter element may be of length 10 to 45 mm, e.g. 15 to 35 mm e.g. 11 to 25 mm, e.g. 12 to 16 mm, , e.g. 20 to 30 mm. The filter or filter element may be of circumference from 14 to 28 mm, e.g. 16 to 26 mm, e.g. 16 to 25 mm, e.g. 16 to 19 mm, e.g. 24 to 25 mm. The filter or filter element may have a maximum diameter from 5 mm to 10 mm, e.g. 5.3 mm to 7.8 mm. The tobacco smoke filter or filter element may be used in smoking articles (e.g. a cigarette, e.g. a tobacco heat product) in a variety of different circumferences (e.g. microslim e.g. superslim, e.g. slim, e.g. standard, e.g. king size).

[0019] The present invention provides a smoking article (e.g. cigarette, e.g. tobacco heat product) comprising a tobacco smoke filter or filter element according to the invention. The tobacco smoke filter or filter element of the present invention is suitable for use with all varieties of tobacco blends. In a filter smoking article according to the invention, a filter of the invention (or a filter which includes a filter element of the invention) is joined to a wrapped tobacco rod with one end of the filter towards the tobacco. The filter may be joined to the wrapped tobacco rod by ring tipping [which engages around just the adjacent ends of the (wrapped) filter and rod to leave

much of the filter wrap exposed]. The filter may be joined by a full tipping overwrap (which engages around the full filter length and the adjacent end of the tobacco rod).

[0020] The invention includes (e.g. double and higher) length filter rods (and/or filter element rods), including a plurality of filter rods (filter element rods), e.g. joined end to end. The tobacco smoke filter or filter element may also be incorporated into a multi-segment filter as a single segment.

[0021] The tobacco smoke filter or filter element of the present invention may be made by the following method. The method comprises the steps of:

- (a) arranging plugs of tobacco smoke filtering material on a filter wrapper (e.g. garniture) longitudinally at intervals so as to leave spaces between plugs;
- (b) applying adhesive to the filter wrapper in register with the arranged plugs, so there is no adhesive in register with the spaces between the plugs;
- (c) gathering the wrapper and plugs together such that the adhesive will be in register with the plugs but not in register with the spaces between plugs;
- (d) inserting receptacles for an additive (e.g. a capsule, e.g. a frangible capsule) into spaces between the plugs of tobacco smoke filtering material (e.g. as the wrapper and plugs are gathered together);
- (e) securing the wrapper around the plugs of tobacco smoke filtering material (e.g. using further adhesive applied to the edge of the wrapper) to form a continuous rod of alternating wrapped plugs and cavities, such that no adhesive is present in the cavities; and optionally;
- (f) cutting the resulting continuous product rod to form individual filters or filter elements.

[0022] The method of production of a tobacco smoke filter or filter element of the present invention allows for use of standard cellulose acetate tow items for example NWA (non-wrapped acetate) filtering plugs. It will be appreciated that other materials that are well known in the art may be used to form the tobacco smoke filter material, wrapper and receptacle for an additive.

[0023] The method of production of a tobacco smoke filter or filter element of the present invention requires a combiner machine and an additional capsule inserter kit (known in the art). The filters are produced via the production of a multiple length rod. The machine tow processing is set to arrange plugs of cellulose acetate tow on to a filter wrapper (garniture) longitudinally at intervals so as to leave spaces between plugs. A segment anchorage adhesive is applied to filter wrapper at equivalent intervals to the plugs so there is no adhesive in the spaces between plugs. The wrapper and plugs are brought together ensuring adhesive is in register with the plugs but not in register with the spaces between plugs. The capsule inserter kit is then set to insert capsules into the spaces between the plugs of cellulose acetate tow by means of a capsule drum. A filter containing two or

more capsules may also be produced. The wrapper, with adhesive applied to the edge, is gathered and secured around the plugs to form a continuous rod of alternating wrapped plugs and cavities, such that no adhesive is present in the cavities. The adhered wrapper forms a continuous rod of alternating wrapped plugs and cavities with one or more receptacles for an additive enclosed in each cavity. An optional step of cutting the resulting continuous product rod to form individual filters or filter elements may then be executed.

[0024] The continuous rod may be cut through each plug of tobacco smoke filtering material. Cutting may occur at any position through the plug of tobacco smoke filtering material to produce variations in size of the first and second plugs of tobacco smoke filtering material and cavity position within the longitudinally extending core. For example, cutting longitudinally through the centre of the plugs of tobacco smoke filtering material will create individual tobacco smoke filter or filter elements with first and second longitudinally extending rods of tobacco smoke filtering material of equal size surrounding a centrally located cavity. Cutting at other positions will create individual tobacco smoke filter or filter elements with first and second longitudinally extending rods of tobacco smoke filtering material of different size surrounding an off-centre cavity. The filter or filter element length will not be affected by variation in cutting, and the performance (e.g. the pressure drop) of the final filter will be consistent.

[0025] The present invention will now be illustrated by way of an example with reference to the accompanying drawing.

Figure 1 shows a perspective view, not to scale, of a tobacco smoke filter or filter element according to an example of the invention.

Figure 2 shows a cross-section, not to scale, view of Figure 1 when cut along the filter's longitudinal axis.

Figure 3 shows a birds-eye-view of a cross section, not to scale, of the method of production of a multiple length rod according to an example of the invention.

Figure 4 shows a perspective view, not to scale, of a tobacco smoke filter or filter element according to a second example of the invention.

[0026] Figure 1 and 2 show a tobacco smoke filter or filter element of 27 mm length and 24.5 mm circumference comprising a longitudinally extending cylindrical core 1 which includes first and second longitudinally extending rods of tobacco smoke filtering material 2 and 3 in the form of NWA (non-wrapped acetate) crimped tow. The first rod of tobacco smoke filtering material 2 is distanced longitudinally from the second rod of tobacco smoke filtering material 3. Engaged around the first and second longitudinally extending rods 2, 3 (and the dis-

tance between) is a wrapper 4 of transparent air-permeable plugwrap which is held in place with an adhesive stuck seam along portions of its length. The wrapper 4 defines a cavity 5 of length 5 mm and diameter 7.8 mm between the first and second rods of tobacco smoke filtering material 2 and 3. A segment anchoring adhesive is applied to wrapper 4 in register with the first and second rods of tobacco smoke filtering material 2 and 3 (to hold rods 2 and 3 in place) but is not applied in register with the spaces between plugs, as such that no segment anchoring adhesive is present within the cavity 5. A receptacle for additive in the form of a frangible capsule 6 of diameter 3.5 mm, which includes a menthol flavouring agent, is fully enclosed within the cavity 5. Frangible capsule 6 has a diameter of less than 50% of the diameter of cavity 5. The void space in cavity 5 (e.g. the space not occupied by frangible capsule 6) is 88%. The dimensions of cavity 5 and the absence of adhesive within the cavity, mean that capsule 6 is free to move within the cavity 5. The wrapper 4 serves as a window into cavity 5 which may be used to identify the flavourant in the capsule 6 (e.g. a green capsule for menthol) and establish whether or not the capsule 6 has been broken. This wrapper 4 further differentiates the filter for anti-counterfeiting purposes. In other examples the wrapper 4 may be opaque with an opacity of 71% or more (measured according to ISO 2471:2008 Paper and board - Determination of opacity (paper backing) - Diffuse reflectance method).

[0027] It will be appreciated that the filter 1 may be joined to a wrapped tobacco rod to form a cigarette, by methods well known in the art. The filter may, for example, be joined to the wrapped tobacco rod by ring tipping [which engages around just the adjacent ends of the (wrapped) filter and rod to leave much of the filter wrap exposed]. The filter may, for example, be joined by a full tipping overwrap (which engages around the full filter length and the adjacent end of the tobacco rod).

[0028] Figure 3 illustrates a birds-eye-view of a cross section of the method of production of a multiple length rod according to an example of the invention. The continuous rod of filters 7 comprises plugs of tobacco smoke filtering material 8, which are adhered to wrapper 9. No adhesive is present within the cavity 10 hence capsule 11 is able to move freely within the cavity. The continuous rod of filters 7 may be cut to create individual tobacco smoke filter or filter elements as in Figure 1 and 2. It will be appreciated that cutting may occur at a range of positions through the plugs of tobacco smoke filtering material to create individual tobacco smoke filter or filter elements.

[0029] The method of production of a filter element according to the present invention requires a combiner machine and an additional capsule inserter kit (known in the art). The filters are produced via the production of a multiple length rod. The machine tow processing is set to arrange plugs of cellulose acetate tow 8 on to a filter wrapper 9 (garniture) longitudinally at intervals so as to

leave spaces between plugs 8. A segment anchorage adhesive is applied to filter wrapper 9 at equivalent intervals to the plugs 8 so there is no adhesive in the spaces between plugs. Conventionally, segment anchorage gluing is a continual line of glue that hold the segments in place - so that when smoked the segment will not come out into the smokers mouth. The method uses pulses of spray adhesive to apply a discontinuous line of adhesive which is in register with the plugs but not in the cavity. The wrapper 9 and plugs 8 are brought together ensuring adhesive is in register with the plugs 8 but not in register with the spaces between plugs 8. The capsule inserter kit is then set to insert capsules 11 into the spaces between the plugs 8 of cellulose acetate tow by means of a capsule drum. The wrapper 9, with adhesive applied to the edge, is gathered and secured around the plugs 8 to form a continuous rod of alternating wrapped plugs 8 and cavities 10 (each cavity 10 containing a capsule 11), such that no adhesive is present in the cavities. The adhered wrapper forms a continuous rod of alternating wrapped plugs and cavities with one or more receptacles for an additive enclosed in each cavity. The resulting continuous product rod is cut to form individual filters or filter elements.

[0030] Figure 4 shows a tobacco smoke filter or filter element of 27 mm length and 24.5 mm circumference comprising a longitudinally extending cylindrical core 101 which includes first and second longitudinally extending rods of tobacco smoke filtering material 102 and 103 in the form of wrapped acetate crimped tow. The first rod of tobacco smoke filtering material 102 is distanced longitudinally from the second rod of tobacco smoke filtering material 103. Engaged around the first and second longitudinally extending rods 102, 103 (and the distance between) is an opaque wrapper 104 of air-permeable plug-wrap with an opacity of 71% or more (measured according to ISO 2471:2008 Paper and board - Determination of opacity (paper backing) - Diffuse reflectance method), which is held in place with an adhesive stuck seam along portions of its length. The wrapper 104 defines a cavity 105 of length 5 mm and diameter 7.8 mm between the first and second rods of tobacco smoke filtering material 102 and 103. A segment anchoring adhesive is applied to wrapper 104 in register with the first and second rods of tobacco smoke filtering material 102 and 103 (to hold rods 102 and 103 in place) but is not applied in register with the spaces between plugs, as such that no segment anchoring adhesive is present within the cavity 105. Engaged around the wrapper 104 is tipping paper 107, used to join the tobacco smoke filter or filter element 101 to a wrapped tobacco rod (although not shown in Figure 4). A receptacle for additive in the form of a frangible capsule 106 of diameter 3.5 mm, which includes a menthol flavouring agent, is fully enclosed within the cavity 105. Frangible capsule 106 has a diameter of less than 50% of the diameter of cavity 105. The void space in cavity 105 (e.g. the space not occupied by frangible capsule 106) is 88%. The dimensions of the frangible capsule

106 in relation to the dimensions of cavity 105 and the absence of adhesive within the cavity 105, mean that capsule 106 is free to move within the cavity 105.

5 Example 1

[0031] An experiment was performed in order to measure the effect the capsule in the cavity had on the menthol yield in the smoke. The filter A (according to Figure 4) was made by the methods described above. Filter A was tested against a conventional filter B with a capsule embedded within the tobacco smoke filtering material well known in the art. The capsule of filter A and the capsule of filter B were crushed prior to smoking to release menthol flavourant.

[0032] The average menthol smoke yield smoke for filters A and B were measured by methods well known in the art (ISO 13110:2012 specifies a method for the gas-chromatographic determination of menthol in the total particulate matter (TPM) of mentholated cigarette smoke condensates). The results are illustrated in Table 1. The pad measurement data indicates the yield of menthol in the smoke.

25 **Table 1**

	Menthol on pad / mg
Filter A	1.19
Filter B	0.75

[0033] The applicants have surprisingly found that positioning of a free moving capsule within the cavity supplies a greater yield of flavourant to the user compared to a capsule embedded within the tobacco smoke filtering material. The menthol yield in the smoke is higher when the crushed capsule is positioned within the cavity (and is free to move within the cavity) thus the user experiences increased flavour delivery.

Claims

1. A tobacco smoke filter or filter element comprising: a longitudinally extending core (1) which includes first (2) and second (3) longitudinally extending rods of tobacco smoke filtering material, wherein the first (2) rod of tobacco smoke filtering material is distanced longitudinally from the second (3) rod of tobacco smoke filtering material; a wrapper (4) engaged around the first (2) and second (3) longitudinally extending rods such that the wrapper (4) defines a cavity (5) between the first (2) and second (3) rods of tobacco smoke filtering material wherein the wrapper (4) is opaque with an opacity of 71% or more measured according to ISO 2471:2008 (Paper and board - Determination of opacity (paper backing) - Diffuse reflectance method) and a weight of 23

- grams per square meter to 100 grams per square meter; and at least one receptacle for an additive (6) located in the cavity (5), wherein the maximum width or diameter of the receptacle for an additive (6) is less than half the maximum diameter of the cavity (5) and the void space remaining in the cavity (5) is greater than 50% of the volume of the cavity (5), the receptacle (6) being free to move within the cavity.
2. A tobacco smoke filter or filter element according to claim 1 wherein the receptacle for an additive (6) is a capsule, e.g. a frangible capsule and/or the receptacle for an additive includes an additive in the form of a flavourant.
 3. A tobacco smoke filter or filter element according to any preceding claim wherein the void space remaining in the cavity (5) is 51 to 90 %, e.g. 55 to 80 %, e.g. 60 to 75 % of the volume of the cavity.
 4. A tobacco smoke filter or filter element according to any preceding claim wherein the longitudinally extending core (1) is a substantially cylindrical core.
 5. A tobacco smoke filter or filter element according to any preceding claim wherein the tobacco smoke filtering material of the first (2) and/or second (3) rod of tobacco smoke filtering material comprises a natural or synthetic filamentary tow, e.g. of cotton or plastics such as polyethylene or polypropylene, or cellulose acetate filamentary tow, natural or synthetic staple fibres, cotton wool, a web material such as paper, usually creped, an e.g. synthetic non-woven material, and/or an extruded material e.g. (e.g. starch, synthetic foams, extruded foams).
 6. A tobacco smoke filter or filter element according to any preceding claim wherein the filtering material includes carbon, e.g. activated carbon.
 7. A tobacco smoke filter or filter element according to any preceding claim wherein the tobacco smoke filtering material of first (2) rod of tobacco smoke filtering material and the tobacco smoke filtering material of the second (3) rod of tobacco smoke filtering material are different.
 8. A tobacco smoke filter or filter element according to any preceding claim wherein the longitudinally extending core (1) is of perimeter or circumference 14 to 28 mm, e.g. 16 to 26 mm, e.g. 16 to 25 mm, e.g. 16 to 19 mm, e.g. 24 to 25 mm.
 9. A tobacco smoke filter or filter element according to any preceding claim wherein the cavity (5) is of length 3.5 mm to 32 mm e.g. 3.5 to 25 mm, e.g. 4 to 22 mm, e.g. 5 to 21 mm, e.g. 7 to 14 mm.
 10. A tobacco smoke filter or filter element according to any preceding claim wherein the region of the cavity (5) is free of adhesive.
 11. A tobacco smoke filter or filter element according to any preceding claim wherein the receptacle for an additive (6), e.g. capsule, is of width 2 to 5 mm, e.g. 2.5 to 4 mm, e.g. 2.5 to 3.9 mm, e.g. 3.0 to 3.8 mm, e.g. 3.2 to 3.7 mm, e.g. 3.35 or 3.5 mm.
 12. A tobacco smoke filter or filter element according to any preceding claim wherein the diameter of the longitudinally extending core (1) is at least 0.7 mm greater than the maximum width of the receptacle for an additive (6).
 13. A smoking article, e.g. a cigarette, e.g. a tobacco heat product, comprising a tobacco smoke filter according to any preceding claim, or a tobacco smoke filter including a filter element according to any preceding claim, joined to a wrapped tobacco rod with one end of the filter towards the tobacco.
 14. A multiple rod comprising a plurality, e.g. 2, 4, 6 etc. of tobacco smoke filters or filter elements according to any preceding claim integrally joined end-to-end.
 15. A tobacco smoke filter or filter element according to any claim 1-12 wherein the cavity (5) has a diameter from 5 mm to 10 mm, e.g. 5.3 mm to 7.8 mm.

Patentansprüche

1. Tabakrauchfilter oder -filterelement, Folgendes aufweisend: einen sich längs erstreckenden Kern (1), der einen ersten (2) und einen zweiten (3) sich längs erstreckenden Stab aus Tabakrauchfiltermaterial umfasst, wobei der erste (2) Stab aus Tabakrauchfiltermaterial in Längsrichtung von dem zweiten (3) Stab aus Tabakrauchfiltermaterial beabstandet ist; eine Umhüllung (4), die um den ersten (2) und den zweiten (3) sich längs erstreckenden Stab in Anlage ist, so dass die Umhüllung (4) zwischen dem ersten (2) und dem zweiten (3) Stab aus Tabakrauchfiltermaterial einen Hohlraum (5) definiert, wobei die Umhüllung (4) mit einer Opazität von 71 % oder mehr, gemessen nach ISO 2471:2008 (Paper and board - Determination of opacity (paper backing) - Diffuse reflectance method), und einem Gewicht von 23 Gramm pro Quadratmeter bis 100 Gramm pro Quadratmeter opak ist; und mindesten ein Behältnis für einen Zusatz (6), das sich in dem Hohlraum (5) befindet, wobei die bzw. der maximale Breite oder Durchmesser des Behältnisses für einen Zusatz (6) kleiner ist als die Hälfte des maximalen Durchmessers des Hohlraums (5) und der im Hohlraum (5) verbleibende leere Raum größer ist als 50 % des

- Volumens des Hohlraums (5), wobei das Behältnis (6) sich im Hohlraum frei bewegen kann.
2. Tabakrauchfilter oder -filterelement nach Anspruch 1, wobei das Behältnis für einen Zusatz (6) eine Kapsel ist, z. B. eine zerbrechliche Kapsel, und/oder das Behältnis für einen Zusatz einen Zusatz in der Form eines Aromastoffs beinhaltet.
 3. Tabakrauchfilter oder -filterelement nach einem der vorhergehenden Ansprüche, wobei der in dem Hohlraum (5) verbleibende leere Raum 51 bis 90 %, z. B. 55 bis 80 %, z. B. 60 bis 75 %, des Volumens des Hohlraums ist.
 4. Tabakrauchfilter oder -filterelement nach einem der vorhergehenden Ansprüche, wobei der sich längs erstreckende Kern (1) ein im Wesentlichen zylindrischer Kern ist.
 5. Tabakrauchfilter oder -filterelement nach einem der vorhergehenden Ansprüche, wobei das Tabakrauchfiltermaterial des ersten (2) und/oder zweiten (3) Stabs aus Tabakrauchfiltermaterial einen natürlichen oder synthetischen Filamentfaserstoff, z. B. aus Baumwolle oder Kunststoff, wie Polyethylen oder Polypropylen, oder Celluloseacetat-Filamentfaserstoff, natürliche oder synthetische Stapelfasern, Watte, ein Bahnmaterial, wie etwa ein Papier, in der Regel gekreppt, einen z. B. synthetischen Vliesstoff und/oder ein extrudiertes Material, z. B. Stärke, synthetische Schaumstoffe, extrudierte Schaumstoffe, beinhaltet.
 6. Tabakrauchfilter oder -filterelement nach einem der vorhergehenden Ansprüche, wobei das Filtermaterial Kohlenstoff, z. B. Aktivkohle, beinhaltet.
 7. Tabakrauchfilter oder -filterelement nach einem der vorhergehenden Ansprüche, wobei das Tabakrauchfiltermaterial des ersten (2) Stabs aus Tabakrauchfiltermaterial und das Tabakrauchfiltermaterial des zweiten (3) Stabs aus Tabakrauchfiltermaterial verschieden sind.
 8. Tabakrauchfilter oder -filterelement nach einem der vorhergehenden Ansprüche, wobei der sich längs erstreckende Kern (1) einen Umfang von 14 bis 28 mm, z. B. 16 bis 26 mm, z. B. 16 bis 25 mm, z. B. 16 bis 19 mm, z. B. 24 bis 25 mm, hat.
 9. Tabakrauchfilter oder -filterelement nach einem der vorhergehenden Ansprüche, wobei der Hohlraum (5) eine Länge von 3,5 mm bis 32 mm, z. B. 3,5 mm bis 25 mm, z. B. 4 bis 22 mm, z. B. 5 bis 21 mm, z. B. 7 bis 14 mm hat.
 10. Tabakrauchfilter oder -filterelement nach einem der vorhergehenden Ansprüche, wobei die Region des Hohlraums (5) frei von Klebstoff ist.
 11. Tabakrauchfilter oder -filterelement nach einem der vorhergehenden Ansprüche, wobei das Behältnis für einen Zusatz (6), z. B. eine Kapsel, eine Breite von 2 bis 5 mm, z. B. 2,5 bis 4 mm, z. B. 2,5 bis 3,9 mm, z. B. 3,0 bis 3,8 mm, z. B. 3,2 bis 3,7 mm, z. B. 3,35 oder 3,5 mm hat.
 12. Tabakrauchfilter oder -filterelement nach einem der vorhergehenden Ansprüche, wobei der Durchmesser des sich längs erstreckenden Kerns (1) mindestens 0,7 mm größer als die maximale Breite des Behältnisses für einen Zusatz (6) ist.
 13. Raucherartikel, z. B. eine Zigarette, z. B. ein Tabakerhitzungsprodukt, der einen Tabakrauchfilter nach einem der vorhergehenden Ansprüche oder einen Tabakrauchfilter mit einem Filterelement nach einem der vorhergehenden Ansprüche beinhaltet, das mit einem Ende des Filters zum Tabak an einen umhüllten Tabakstab angefügt ist.
 14. Mehrfachstab, der mehrere, z. B. 2, 4, 6 usw., Tabakrauchfilter oder -filterelemente nach einem der vorhergehenden Ansprüche beinhaltet, die Ende an Ende zu einem Ganzen aneinandergesetzt sind.
 15. Tabakrauchfilter oder -filterelement nach einem der vorhergehenden Ansprüche, wobei der Hohlraum (5) einen Durchmesser von 5 mm bis 10 mm, z. B. 5,3 mm bis 7,8 mm, hat.

Revendications

1. Filtre ou élément filtre à fumée de tabac comprenant : un centre s'étendant longitudinalement (1) qui comprend un premier (2) et un deuxième (3) bâtonnet s'étendant longitudinalement de matériau filtrant la fumée de tabac, dans lequel le premier bâtonnet (2) de matériau filtrant la fumée de tabac est distancé longitudinalement du deuxième bâtonnet (3) de matériau filtrant la fumée de tabac ; un gainage (4) engagé autour du premier (2) et du deuxième (3) bâtonnet s'étendant longitudinalement de telle sorte que le gainage (4) définit une cavité (5) entre le premier (2) et le deuxième (3) bâtonnet de matériau filtrant la fumée de tabac dans lequel le gainage (4) est opaque avec une opacité de 71 % ou plus mesurée conformément à ISO 2471:2008 (Papier et carton - Détermination de l'opacité sur fond papier - Méthode de réflexion en lumière diffuse) et un poids de 23 grammes par mètre carré à 100 grammes par mètre carré ; et au moins un réceptacle pour un additif (6) situé dans la cavité (5), dans lequel la largeur ou diamètre maximal du ré-

- ceptacle pour un additif (6) est moins de la moitié du diamètre maximal de la cavité (5) et l'espace vide restant dans la cavité (5) est supérieur à 50 % du volume de la cavité (5), le réceptacle (6) étant libre de se déplacer dans la cavité.
2. Filtre ou élément filtre à fumée de tabac selon la revendication 1, dans lequel le réceptacle pour un additif (6) est une capsule, par ex. une capsule cassable et/ou le réceptacle pour un additif comprend un additif sous la forme d'un arôme. 10
 3. Filtre ou élément filtre à fumée de tabac selon l'une quelconque des revendications précédentes, dans lequel l'espace vide restant dans la cavité (5) est de 51 à 90 %, par ex. de 55 à 80 %, par ex. de 60 à 75 % du volume de la cavité. 15
 4. Filtre ou élément filtre à fumée de tabac selon l'une quelconque des revendications précédentes, dans lequel le centre s'étendant longitudinalement (1) est un centre sensiblement cylindrique. 20
 5. Filtre ou élément filtre à fumée de tabac selon l'une quelconque des revendications précédentes, dans lequel le matériau filtrant la fumée de tabac du premier (2) et du deuxième (3) bâtonnet de matériau filtrant la fumée de tabac comprend une étoupe filamenteuse naturelle ou synthétique, par ex. de coton ou de plastique tel que du polyéthylène ou du polypropylène, ou de l'étoupe filamenteuse d'acétate de cellulose, des fibres discontinues naturelles ou synthétiques, de l'ouate, un matériau en bande telle que du papier, habituellement crêpé, un matériau par ex. un non tissé synthétique et/ou un matériau extrudé par ex. amidon, mousses synthétiques, mousses extrudées. 25
 6. Filtre ou élément filtre à fumée de tabac selon l'une quelconque des revendications précédentes, dans lequel le matériau filtrant comprend du charbon, par ex. du charbon actif. 30
 7. Filtre ou élément filtre à fumée de tabac selon l'une quelconque des revendications précédentes, dans lequel le matériau filtrant la fumée de tabac du premier bâtonnet (2) de matériau filtrant la fumée de tabac et le matériau filtrant la fumée de tabac du deuxième bâtonnet (3) de matériau filtrant la fumée de tabac sont différents. 35
 8. Filtre ou élément filtre à fumée de tabac selon l'une quelconque des revendications précédentes, dans lequel le centre s'étendant longitudinalement (1) est d'un périmètre ou d'une circonférence de 14 à 28 mm, par ex. de 16 à 26 mm, par ex. de 16 à 25 mm, par ex. de 16 à 19 mm, par ex. de 24 à 25 mm. 40
 9. Filtre ou élément filtre à fumée de tabac selon l'une quelconque des revendications précédentes, dans lequel la cavité (5) est d'une longueur de 3,5 mm à 32 mm, par ex. de 3,5 à 25 mm, par ex. de 4 à 22 mm, par ex. de 5 à 21 mm, par ex. de 7 à 14 mm. 45
 10. Filtre ou élément filtre à fumée de tabac selon l'une quelconque des revendications précédentes, dans lequel la région de la cavité (5) est exempte d'adhésif. 50
 11. Filtre ou élément filtre à fumée de tabac selon l'une quelconque des revendications précédentes, dans lequel le réceptacle pour un additif (6), par ex. une capsule, est d'une largeur de 2 à 5 mm, par ex. de 2,5 à 4 mm, par ex. de 2,5 à 3,9 mm, par ex. de 3,0 à 3,8 mm, par ex. de 3,2 à 3,7 mm, par ex. de 3,35 à 3,5 mm. 55
 12. Filtre ou élément filtre à fumée de tabac selon l'une quelconque des revendications précédentes, dans lequel le diamètre du centre s'étendant longitudinalement (1) est d'au moins 0,7 mm plus grand que la largeur maximale du réceptacle pour un additif (6).
 13. Article à fumer, par ex. une cigarette, un produit de tabac chauffé, comprenant un filtre à fumée de tabac selon l'une quelconque des revendications précédentes, ou un filtre à fumée de tabac comprenant un élément filtre selon l'une quelconque des revendications précédentes, joint à un boudin de tabac enveloppé avec une extrémité du filtre vers le tabac.
 14. Bâtonnet multiple comprenant une pluralité de, par ex. 2, 4, 6 etc. filtres ou éléments filtres à fumée de tabac selon l'une quelconque des revendications précédentes intégralement joints bout à bout.
 15. Filtre ou élément filtre à fumée de tabac selon l'une quelconque des revendications 1-12, dans lequel la cavité (5) a un diamètre de 5 mm à 10 mm, par ex. de 5,3 mm à 7,8 mm.

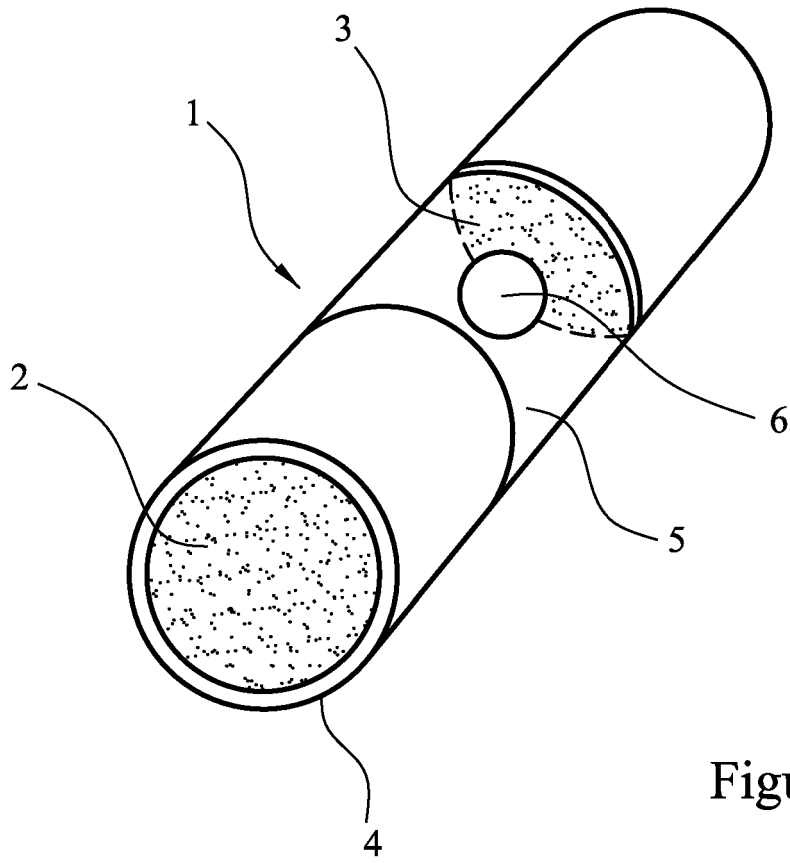


Figure 1

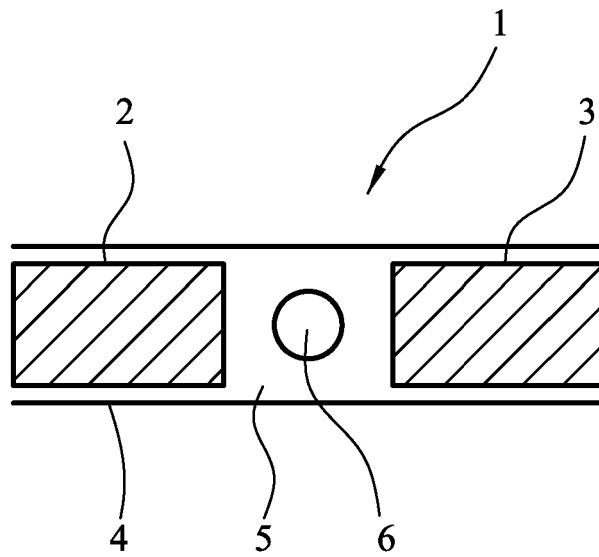


Figure 2

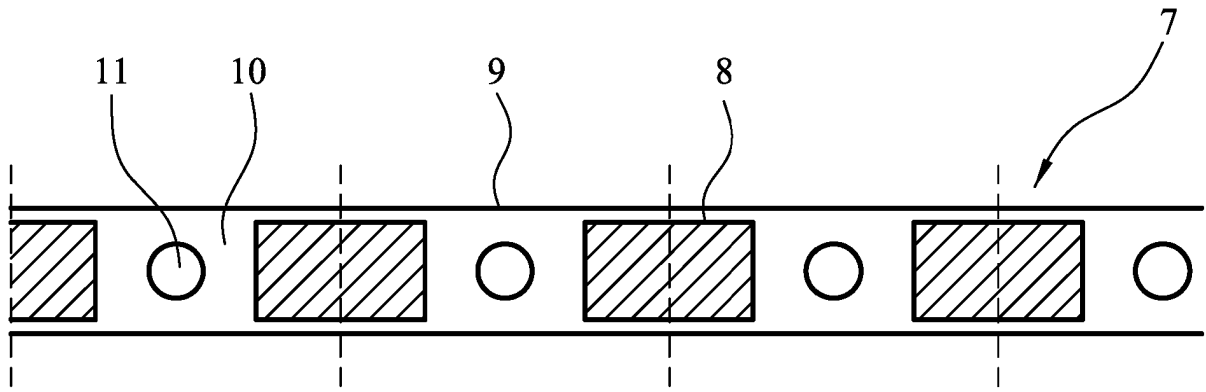


Figure 3

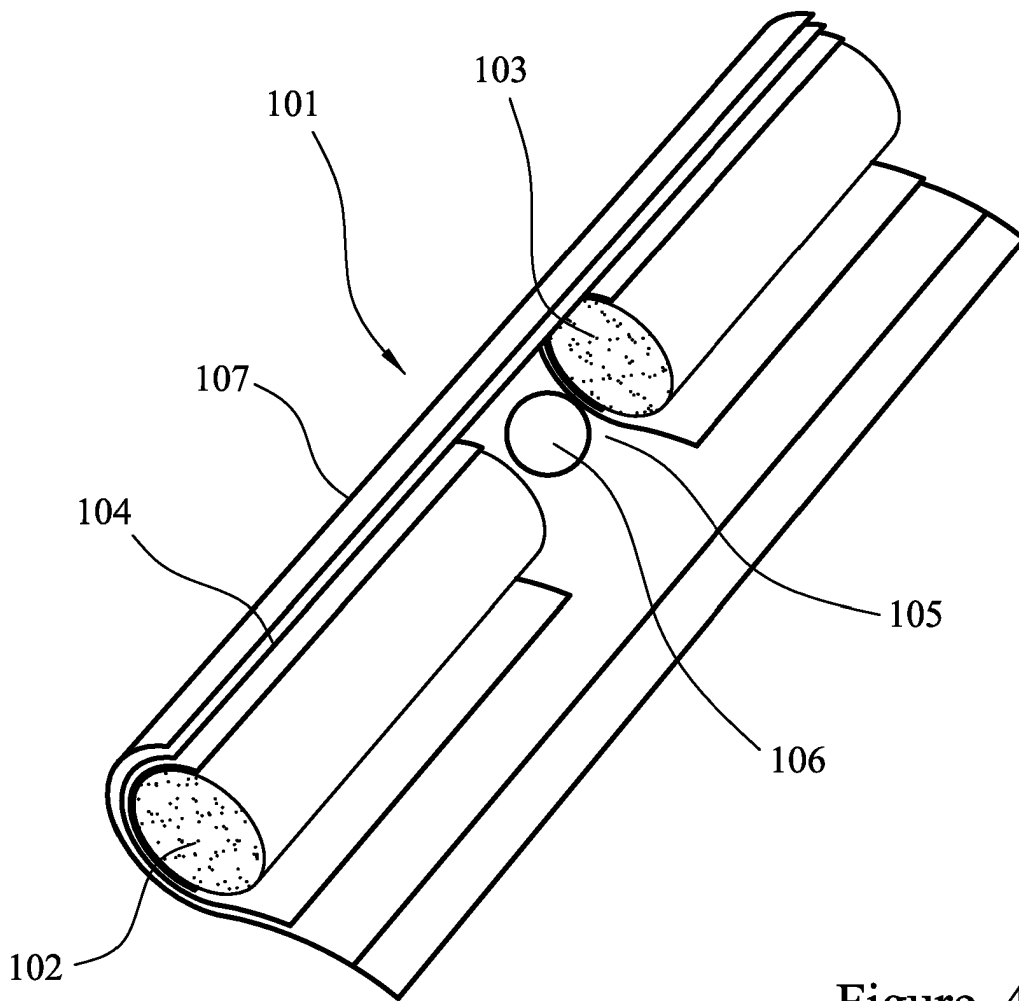


Figure 4

REFERENCES CITED IN THE DESCRIPTION

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