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(54) **Title**: SMOKING ARTICLE HAVING EMBOSSED TRANSPARENT WRAPPER

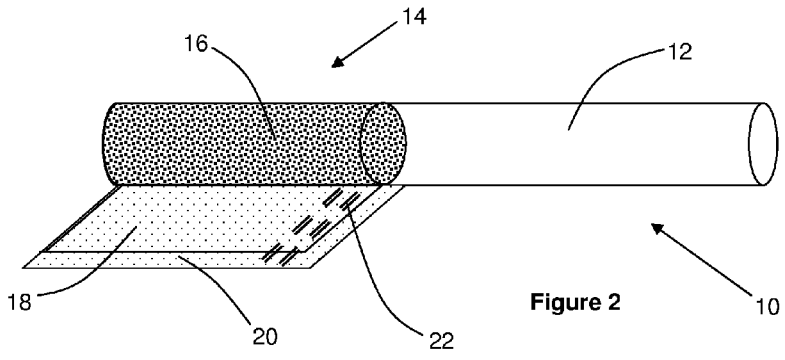

Figure 2

(57) **Abstract**: A smoking article (10) comprises an aerosol generating substrate (12); a mouthpiece (14) in axial alignment with the aerosol generating substrate, the mouthpiece comprising one or more segments (16); and a wrapper (20) circumscribing the mouthpiece. The wrapper (20) comprises an embossed sheet material which has a plurality of embossments on the surface forming a repeating pattern and is substantially transparent, such that the underlying mouthpiece (14) is visible through the embossed sheet material of the wrapper. The wrapper (20) is preferably a tipping wrapper connecting the mouthpiece (14) to the aerosol generating substrate (12).

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SMOKING ARTICLE HAVING EMBOSSED TRANSPARENT WRAPPER

The present invention relates to a novel smoking article having a mouthpiece circumscribed by an outer wrapper comprising an embossed and substantially transparent sheet material, and to a method for producing such a smoking article.

Filter cigarettes typically comprise a cylindrical rod of tobacco cut filler surrounded by a paper wrapper and a cylindrical filter axially aligned in an abutting end-to-end relationship with the wrapped tobacco rod. Conventionally, the wrapped tobacco rod and the filter are joined by a band of tipping wrapper, typically formed of an opaque paper material that circumscribes the entire length of the filter and an adjacent portion of the wrapped tobacco rod.

A number of smoking articles in which tobacco is heated rather than combusted have also been proposed in the art. In heated smoking articles, an aerosol is generated by heating a flavour generating substrate, such as tobacco. Known heated smoking articles include, for example, electrically heated smoking articles and smoking articles, in which an aerosol is generated by the transfer of heat from a combustible fuel element or heat source to a physically separate aerosol forming material. During smoking, volatile compounds are released from the aerosol forming substrate by heat transfer from the fuel element and entrained in air drawn through the smoking article. As the released compounds cool they condense to form an aerosol that is inhaled by the consumer.

It has previously been proposed to provide a wrapper for a smoking article that is at least partially formed of a transparent material, such that a part of the smoking article is visible through the wrapper. For example, US-A-5,396,909 discloses a filter with a tipping wrapper formed of a transparent sheet or film material, such as a transparent polymeric or cellulose material, which allows the consumer to observe the effectiveness of the underlying filter. WO-A-2009/106374 similarly discloses a filter with a tipping wrapper formed of a transparent material, but wherein an opaque coating is applied to a portion of the wrapper so that only part of the underlying filter is visible.

However, it has been found that the use of such transparent, polymeric or cellulosic materials can be unappealing to the consumer due to the different texture of the material compared with traditional tipping paper. In particular, the smoother texture of the transparent materials is typically very different to that of a paper material and the materials are typically non-absorbent. This gives a different and unfamiliar feel to the consumer when the filter is placed against the lips and subsequently released from the lips during smoking.

It would be desirable to provide a smoking article having novel, alternative means for allowing the consumer to view a part of the smoking article, but which provides an outer wrapper having a more acceptable feel against the lips.

According to the invention there is provided a smoking article comprising: an aerosol generating substrate; a mouthpiece in axial alignment with the aerosol generating substrate, the mouthpiece comprising one or more segments; and a wrapper circumscribing the mouthpiece. The wrapper comprises a substantially transparent sheet material that defines the outer surface of at least a portion of the mouthpiece. The sheet material is embossed with a repeating pattern of embossments. The underlying mouthpiece is at least partially visible through the embossed, substantially transparent sheet material.

The term 'substantially transparent' is used to describe a material which allows at least a significant proportion of incident light to pass through it, so that it is possible to see through the material. In the present invention, the substantially transparent sheet material allows sufficient light to pass through it that the underlying mouthpiece is visible through the wrapper. The substantially transparent sheet material may be completely transparent. Alternatively, the material may have a lower level of transparency whilst still transmitting sufficient light that the mouthpiece is visible through the wrapper. The embossments on the surface of the sheet material used in the present invention preferably have minimal effect on the transparency of the material and therefore the visibility of the mouthpiece through the sheet material, although some alteration of the image of the mouthpiece may occur.

The thickness of the substantially transparent sheet material is preferably at least 20 micrometers, and more preferably between 20 micrometers and 50 micrometers, and most preferably between 28 micrometers and 50 micrometers. The basis weight of the substantially transparent sheet material is preferably at least 28 grams per square meter (gsm), and more preferably between 28 gsm and 70 gsm, and most preferably between 40 gsm and 70 gsm. Suitable materials for use as the substantially transparent wrapper of the smoking articles according to the present invention include but are not limited to cellophane and polypropylene. Different grades, thicknesses and basis weights of suitable substantially transparent materials are commercially available from various sources, for example, Innovia Films Ltd.

The term 'embossed' is used to refer to a material which has a pattern or image impressed or imprinted onto the surface such that the pattern or image is raised from the overall surface of the sheet. The term 'embossment' refers to the impression produced by the embossing process. Embossments may be formed on the transparent sheet material using a variety of known embossing techniques using, for example, embossing dies or rollers. Suitable apparatus for forming the embossed transparent wrapper of the present invention is commercially available from various sources, for example Boegli-Gravures S.A.

The term 'repeating pattern' refers to an embossing pattern that is formed through the repetition of an embossment or group of embossments of a particular form in one or more directions.

Preferably, the wrapper is formed entirely of the embossed, substantially transparent sheet material, although wrappers comprising other materials in addition to the embossed sheet material may also be suitable for use in certain embodiments of the present invention. The wrapper may circumscribe the mouthpiece along the entire length of the mouthpiece or along just a part of the length of the mouthpiece. The wrapper may be overwrapped with an additional wrapper of a different material but at least a part of the wrapper is uncovered such that the mouthpiece is visible through the embossed, substantially transparent sheet material. Particularly preferably, the wrapper is a tipping wrapper which circumscribes the mouthpiece along its length and connects the mouthpiece to the aerosol generating substrate.

In smoking articles according to the present invention the wrapper comprising the embossed sheet material defines the outer surface of at least a part of the mouthpiece. The embossment of the surface of the substantially transparent sheet material forming the wrapper alters the surface texture of the wrapper compared with the non-embossed transparent material. Prior to embossment, the substantially transparent materials typically have a very smooth and even surface which has a 'plastic' feel that some consumers do not find appealing on a smoking article mouthpiece. In contrast, the surface of the embossed sheet material has a rougher surface, which more closely resembles that of a conventional tipping paper. The wrappers of the smoking articles of the present invention therefore provide a more acceptable outer surface to the mouthpiece than conventional transparent tipping materials. In particular, the mouth feel of the mouthpiece when the smoking article is placed between the consumer's lips has been found to be preferable to the mouth feel of a non-embossed transparent wrapper.

The use of a wrapper that is both substantially transparent and embossed with a repeating pattern of embossments therefore provides the advantage of visibility of the mouthpiece whilst overcoming the problems previously associated with the texture of the transparent materials. The use of a substantially transparent tipping paper allows the consumer to view the components of the mouthpiece and also to observe any visible effects of the filtration of the mainstream smoke as it is drawn through the mouthpiece during smoking.

The sheet material may be embossed with a repeating pattern over only a part of its surface. In this case, the embossments are preferably provided such that when the substantially transparent wrapper is in place on the mouthpiece of smoking articles according to the invention, the embossments are positioned towards the mouth end of the mouthpiece, which will be in contact with the consumer's lips during smoking. In this way, the embossments are placed where the consumer's lips are most likely to touch the substantially transparent wrapper and the main advantages of providing a more textured surface are obtained. However, most preferably, the repeating pattern of embossments covers all, or substantially all, of the surface of the sheet material so that the embossments are provided uniformly over the surface of the wrapper.

The pitch of an embossing pattern is the distance between repeating patterns of the embossments. In the present invention, the pitch of the plurality of embossments may be varied depending on the apparatus and method of embossing, but the pitch is preferably greater than 0.1mm, more preferably greater than 0.2mm. The pitch is preferably less than 0.8mm, more preferably less than 0.4mm. In some embodiments, the pitch is between 0.1 mm and 0.8 mm, preferably 0.2mm to 0.4mm, and most preferably 0.3mm.

The depth of the plurality of embossments is preferably less than or equal to half of the pitch. The embossments may take any shape or form including but not limited to pyramid shape, dots or lines forming a repeating pattern. Shadow embossing may be obtained through further decreasing the depth to about one third of the pitch to obtain specific patterns.

In certain embodiments of the present invention, the substantially transparent sheet material forming the wrapper is tinted or coloured. In this way, the mouthpiece is still visible through the sheet material but the colour of the image can be varied to provide different and unique visual effects. The tinting or colouring of the substantially transparent sheet material may be achieved through the addition of dies or pigments during manufacture of the sheet material, or in the form of a coating applied to a surface of the sheet material.

Smoking articles according to the present invention may be filter cigarettes or other smoking articles in which tobacco material or another combustible material is combusted to form smoke. Alternatively, smoking articles according to the present invention may be articles in which material is heated to form an aerosol, rather than combusted. In one type of heated smoking article, tobacco material or another aerosol forming material is heated by one or more electrical heating elements to produce an aerosol. In another type of heated smoking article, an aerosol is produced by the transfer of heat from a combustible or chemical heat source to a physically separate aerosol forming material, which may be located within, around or downstream of the heat source.

In certain preferred embodiments of the present invention, the aerosol generating substrate of the smoking article comprises a tobacco rod and the mouthpiece comprises a filter comprising one or more filter segments. Preferably, the substantially transparent wrapper and the outer wrapper both circumscribe the one or more filter segments along at least a part of the length of the filter such that an underlying portion of the filter is visible through the cut-out portion in the outer wrapper. In one particularly preferred embodiment, the outer wrapper is a tipping paper which joins the tobacco rod to the filter.

Where the mouthpiece comprises a filter, the filter may be formed of a single segment or may be a multi-segment filter comprising two or more filter segments which are connected in a longitudinal direction. Where two or more filter segments are provided, the filter segments may be of the same construction and materials as each other but more preferably have a different construction, or contain different filtration material or additives.

The one or more filter segments forming the filter of smoking articles of the present invention may be individually wrapped in a plug wrap. Using different combinations of plug wrap materials underneath the substantially transparent wrapper, it is possible to select which of the filter segments is visible to the consumer. One or more of the filter segments underlying the embossed sheet material may be provided with a substantially transparent plug wrap so that the filter segment is visible through the embossed substantially transparent sheet material. Any of the filter segments of the filter which are not underlying the embossed substantially transparent sheet material or which are not required by be visible through the substantially transparent wrapper may be wrapped in an opaque, paper plug wrap in the conventional manner. The filter segments may then be joined together by a second layer of substantially transparent plug wrap to form the multi-segment filter. The second layer of substantially transparent plug wrap may extend the entire, or less than the entire, length of the filter.

In preferred embodiments of the present invention, the mouthpiece comprises a filter including a filter segment comprising a particulate material, wherein the particulate material is visible through the embossed sheet material. The filter segment comprising the particulate material may be the only segment forming the filter, or may be connected to other filter segments to form a multi-segment filter.

The particulate material may be dispersed through a plug of filtration material. Preferably, the filtration material within the filter segment is a plug of fibrous filtration material, such as cellulose acetate tow or paper. A filter plasticiser may be applied to the fibrous filtration material in a conventional manner, by spraying it onto the separated fibres, preferably before applying the particulate material to the filtration material.

Alternatively or in addition to the filter segment described above, the filter may include a hollow cavity at least partially filled with a particulate material, wherein at least a portion of the at least partially filled cavity is visible through the embossed substantially transparent sheet material. The particulate material within the cavity is therefore visible to the consumer. In such embodiments, the hollow cavity is preferably provided between two plugs of a filtration material, for example a mouth end filter segment downstream of the cavity and a rod end filter segment upstream of the cavity.

Preferably, between 40% and 100% of the volume of the cavity is filled with particulate material, more preferably between 60% and 80% of the volume of the cavity. Cavity filters according to the invention may be produced using known machinery for producing charcoal filters, such as that described in EP-A-1,571,933. Such machinery is commercially available, for example from Filtrona International Ltd., Great Britain.

The particulate material incorporated into the filter segments described above may include at least one sorbent capable of removing at least one gas phase constituent from mainstream smoke drawn through the filter. Preferably, the at least one sorbent is selected

from the group consisting of activated carbon, coated carbon, active aluminium, zeolites, sepiolites, molecular sieves and silica gel.

Alternatively or in addition to the at least one sorbent, the particulate material may include at least one flavourant material. For example, the particulate flavourant material may include particles of a sorbent or cellulosic material impregnated with a liquid flavourant. Alternatively, the particulate material may comprise particles of plant material. The plant material may be in the form of plant leaf, as described in EP-A-1,958,523. For example, the filter segment may include leaf from tobacco, green tea, mint, such as peppermint or spearmint, laurel, eucalyptus, basil, sage, verbena and tarragon. The plant material may alternatively be in the form of a seed, root, bark or flower, such as those typically used as spices.

Alternatively, or in addition to the particulate materials mentioned above, any object of interest to the consumer could be visible through the embossed transparent material. For example, a capsule (for example, with a flavour contained in the capsule), a flavour thread, or a restrictor element could be visible.

Smoking articles according to the present invention may include a variety of different types of filter segments or combinations of filter segments, including those described above as well as other types of filter segments that would be known to the skilled person.

Preferably, one or more rows of circumferential perforations are provided in the embossed sheet material and the perforations are preferably provided at a distance of between 3 mm and 18 mm from the end of the mouthpiece abutting the aerosol generating substrate. Preferably, the perforations are at least 9mm from the mouth end of the mouthpiece. This provides ventilation to the smoking article, so that the mainstream smoke is mixed with ambient air during smoking. The positioning of the perforations as close to the aerosol generating substrate as possible, or upstream of all or most of the embossed substantially transparent wrapper that is visible to the consumer, has been found to advantageously minimise the deposition of particulate matter onto the embossed substantially transparent wrapper during smoking, which would otherwise affect the visibility of the mouthpiece through sheet material.

The present invention further provides a method of producing a smoking article according to the invention, as described above, the method comprising: providing a plurality of discrete filters comprising one or more filter segments; providing a sheet of a substantially transparent material, wherein the sheet is embossed with a repeating pattern or embossments; placing a discrete filter in axial alignment with a tobacco rod; and wrapping the embossed sheet of substantially transparent material around at least a portion of the filter and an adjacent portion of the tobacco rod to form a smoking article.

The embossing of the substantially transparent material may be carried out online on the cigarette maker, by incorporating an embossing apparatus, such as embossing rollers,

upstream of the apparatus for wrapping and gluing the substantially transparent material around the smoking articles.

Alternatively, the embossing of the substantially transparent material may be carried out offline from the cigarette maker, using separate apparatus which may be provided at the same or a different location to the cigarette maker. In this case, the steps of the method of producing the smoking article can be carried out using standard wrapping techniques and apparatus to apply the wrapper comprising the embossed substantially transparent material.

During the method of producing the smoking articles according to the invention, the embossed sheet of a substantially transparent material must be cut to form discrete wrappers for an individual cigarette. This may take place before the embossed sheet is wrapped around the filter and tobacco rod to form the smoking article. Alternatively, the embossed sheet may be wrapped around a succession of filters and tobacco rods to form a continuous line of wrapped smoking articles which are then separated by cutting the embossed sheet between adjacent smoking articles.

Where circumferential lines of perforations are provided in the embossed sheet, the perforations are preferably provided online using a known laser technique. The position of the perforations is registered so that the perforations are provided at the desired position relative to the rod of tobacco.

According to the present invention there is also provided use of an embossed, substantially transparent sheet material as a wrapper on a smoking article comprising a mouthpiece and an aerosol generating substrate. The embossed sheet material includes a repeating pattern of embossments, as described above.

The invention will now be further described with reference to the following drawings in which:

Figure 1 shows a smoking article according to a first embodiment of the present invention;

Figure 2 shows the smoking article of Figure 1 with the filter unwrapped;

Figure 3 shows a smoking article according to a second embodiment of the present invention with the filter unwrapped; and

Figure 4 shows a smoking article according to a third embodiment of the present invention with the filter unwrapped.

The filter cigarette 10 shown in Figures 1 and 2 comprises a wrapped rod 12 of tobacco cut filler which is attached at one end to an axially aligned filter 14 comprising a single filter segment 16 formed of cellulose acetate tow which has been wrapped with a substantially transparent plug wrap 18. The filter segment 16 comprises particles of cut peppermint leaf which have been substantially uniformly dispersed through the cellulose acetate tow. The

wrapped tobacco rod 12 and the filter 14 are joined by an outer tipping wrapper 20, which circumscribes the entire length of the filter 14 and an adjacent portion of the tobacco rod 12.

The tipping wrapper 20 is formed of a substantially transparent sheet material which has been embossed over its entire surface with a uniform pattern of dots. The filter segment 16 including the particles of cut peppermint leaf is visible through the tipping wrapper 20. During smoking, the consumer may additionally be able to observe the effects of the filtration of the mainstream smoke by the cellulose acetate tow.

Circumferential rows of perforations 22 are provided in the tipping wrapper 20 approximately 3 mm from the tobacco rod 12 of the cigarette 10 for ventilation of the cigarette.

The filter cigarette 30 shown in Figure 3 comprises a wrapped rod 32 of tobacco cut filler which is attached to an axially aligned filter 34 comprising three filter segments in abutting end-to-end relationship: a mouth end segment 36, distant from the wrapped tobacco rod 32; a flavour release segment 38, located upstream of the mouth end segment 36; and a rod end segment 40, located upstream of the first flavour release segment 34, which is adjacent to and abuts the wrapped tobacco rod 32.

The mouth end segment 36 comprises a plug of cellulose acetate tow of low filtration efficiency. The flavour release segment 38 comprises a plug of cellulose acetate tow through which flavour granules including menthol flavourant have been substantially uniformly dispersed. The rod end segment 40 comprises a plug of cellulose acetate tow of medium to low filtration efficiency loaded with activated carbon. The mouth end segment 36 is wrapped with a porous opaque plug wrap (not shown), in a known manner. The flavour release segment 38 and the rod end segment 40 are each wrapped with a substantially transparent plug wrap 39.

The combined filter segments are wrapped with a substantially transparent wrapper 42 which circumscribes the entire length of the filter 34. The wrapped tobacco rod 32 and the wrapped filter 34 are joined by an outer tipping wrapper 44, which circumscribes the entire length of the filter 34 and an adjacent portion of the tobacco rod 32.

The outer tipping wrapper 44 is formed from a substantially transparent sheet material which has been embossed across its surface with a regular pattern of embossed lines. The flavour release segment 38 and the rod end segment 40 are both visible through the embossed tipping wrapper. The consumer is therefore able to see some of the flavour granules within the flavour release segment 38 and the activated carbon particles within the rod end segment 40.

The filter cigarette 50 shown in Figure 4 has a similar construction to the cigarette 30 shown in Figure 3 except that in place of the flavour release segment 38 the cigarette 50 includes a sorbent segment 58 formed of a cavity filled with activated carbon particles, provided between the mouth end segment 56 and the rod end segment 60. In addition, the mouth end segment 56 comprises a central cotton thread 62 loaded with a menthol flavourant. The rod end segment 60 comprises a plug of cellulose acetate tow without activated carbon particles.

The mouth end segment 56 and the rod end segment 60 are individually wrapped with a porous opaque plug wrap (not shown), in a known manner. The filter segments are placed within a substantially transparent wrapper 64 with a space between the filter segments. The space between the filter segments is filled with the activated carbon particles, and the substantially transparent wrapper 64 is wrapped around the filter segments to enclose the cavity. The wrapped tobacco rod and the filter 54 are joined by an outer tipping wrapper 66, as described above in relation to cigarette 30.

The tipping wrapper 66 is formed of a substantially transparent material which has been embossed with a repeating pattern across its surface. The sorbent segment 58 is visible through the embossed tipping wrapper 66 such that the consumer is able to see the activated carbon particles within the cavity.

The filters of cigarettes 10, 30 and 50 are produced in a conventional manner, but using substantially transparent sheet materials to wrap filter segments or filters where specified above, in place of a conventional paper material. It will be appreciated that whilst the specific embodiments described above relate to conventional smoking articles comprising a filter and a tobacco rod, a similar arrangement of the substantially transparent wrapper and outer wrapper could also be used on a distillation-based smoking article or an electrically heated smoking article.

CLAIMS

1. A smoking article comprising:

an aerosol generating substrate;

a mouthpiece in axial alignment with the aerosol generating substrate, the mouthpiece comprising one or more segments; and

a wrapper circumscribing the mouthpiece, the wrapper comprising a substantially transparent sheet material that defines the outer surface of at least a portion of the mouthpiece, wherein the substantially transparent sheet material has been embossed with a repeating pattern of embossments.

2. A smoking article according to claim 1 wherein the aerosol generating substrate comprises a tobacco rod and wherein the mouthpiece comprises a filter having one or more filter segments.

3. A smoking article according to claim 1 or 2 wherein the wrapper is a tipping wrapper circumscribing the mouthpiece along at least a portion of its length and connecting the mouthpiece to the aerosol generating substrate.

4. A smoking article according to claim 3 wherein the tipping wrapper is formed entirely of the embossed, substantially transparent sheet material.

5. A smoking article according to any preceding claim wherein the embossed, substantially transparent sheet material comprises a plurality of embossments, the embossments having a pitch between 0.1 mm and 0.8 mm.

6. A smoking article according to claim 5 wherein the depth of the plurality of embossments is less than one half of the pitch.

7. A smoking article according to any preceding claim wherein a plurality of embossments cover substantially the entire surface of the embossed sheet material.

8. A smoking article according to any preceding claim wherein the mouthpiece comprises a multi-segment filter including a filter segment comprising a particulate material, wherein the particulate material is visible through the embossed sheet material.

9. A smoking article according to claim 8 wherein the particulate material is provided within a hollow cavity in the multi-segment filter and wherein the multi-segment filter further comprises a mouth end segment downstream of the cavity and a rod end segment upstream of the cavity.

10. A smoking article according to claim 8 wherein the particulate material is dispersed through a plug of a filter material.

11. A smoking article according to any of claims 8 to 10 wherein the particulate material includes at least one sorbent material.

12. A smoking article according to any of claims 8 to 11 wherein the particulate material comprises particles of plant material.

13. A smoking article according to any preceding claim wherein the repeating pattern of embossments is provided towards the mouth end of the mouthpiece.

14. A method of producing a smoking article according to any preceding claim comprising:

providing a plurality of discrete filters comprising one or more filter segments;

providing a sheet of a substantially transparent material, wherein the sheet is embossed with a repeating pattern of embossments;

placing a discrete filter in axial alignment with a tobacco rod; and

wrapping the embossed sheet of substantially transparent material around at least a portion of the filter and the tobacco rod, forming a smoking article.

15. Use of an embossed, substantially transparent sheet material as a wrapper on a smoking article comprising a mouthpiece and an aerosol generating substrate, wherein the sheet material is embossed with a repeating pattern of embossments.

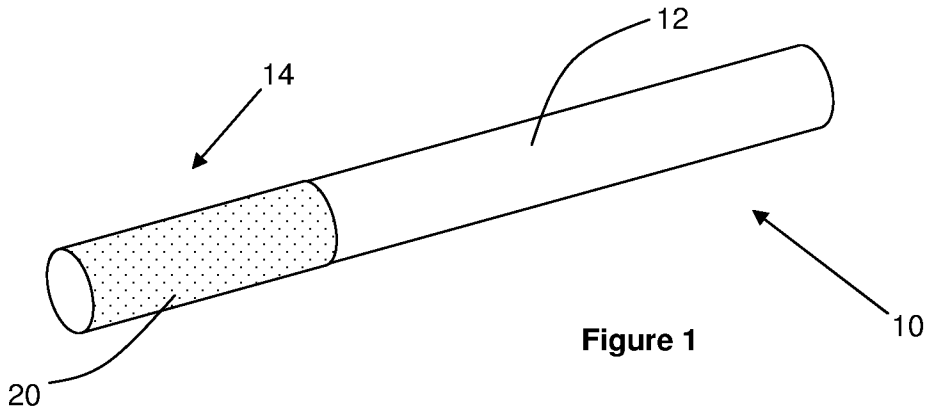

Figure 1

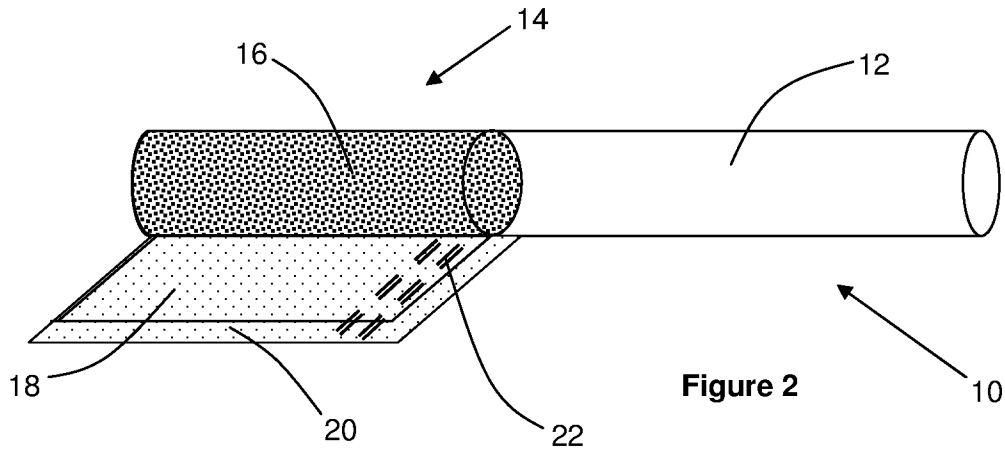

Figure 2

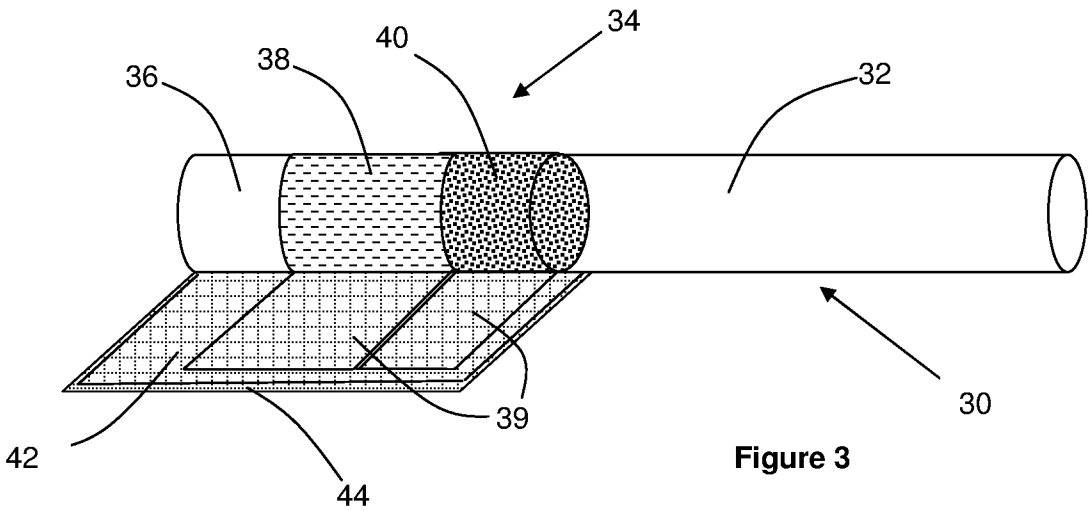

Figure 3

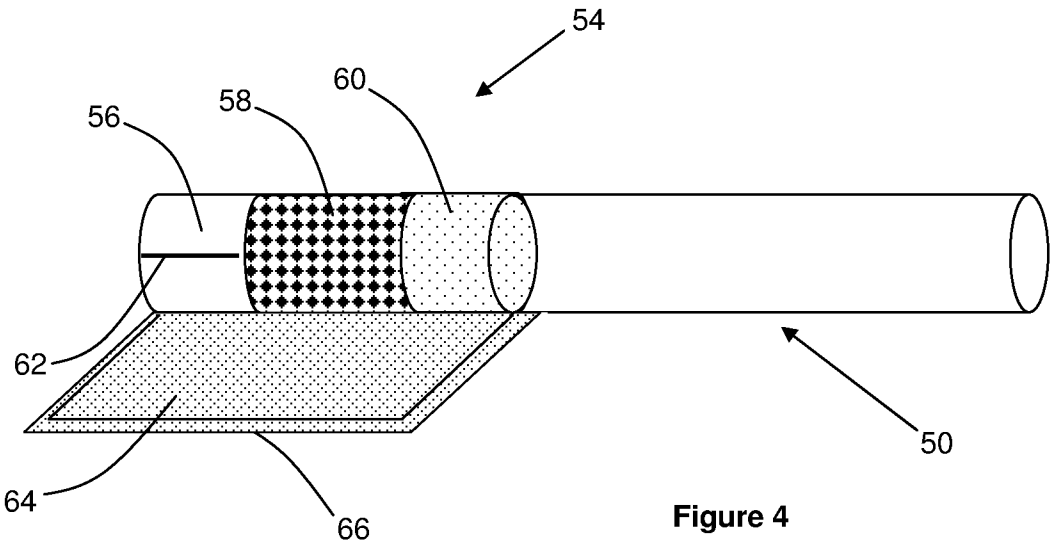

Figure 4

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2011/072196

A. CLASSIFICATION OF SUBJECT MATTER
INV. A24D1/02 A24D3/04
ADD.

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)
A24D

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

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 2 143 345 A1 (REEMTSMA H F & PH [DE]) 13 January 2010 (2010-01-13) paragraph [0023] - paragraph [0040] -----	1,2,5,6, 13,15
X,P	WO 2011/038430 A1 (TANNPAPIER GMBH [AT]; GRIESMAYR GUENTER [AT]) 7 April 2011 (2011-04-07) page 10, line 19 - page 17, line 28; claims 2,4 -----	1-4,7, 13,15
X	US 1 983 530 A (EDWIN BRANDENBERGER JACQUES) 11 December 1934 (1934-12-11) page 1, line 19 - page 2, line 15 -----	1,7,13, 15
Y	US 2006/150991 A1 (LEE HYUNG [KR]) 13 July 2006 (2006-07-13) paragraph [0062] - paragraph [0142] -----	1-4,7-15
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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

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Date of the actual completion of the international search	Date of mailing of the international search report
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