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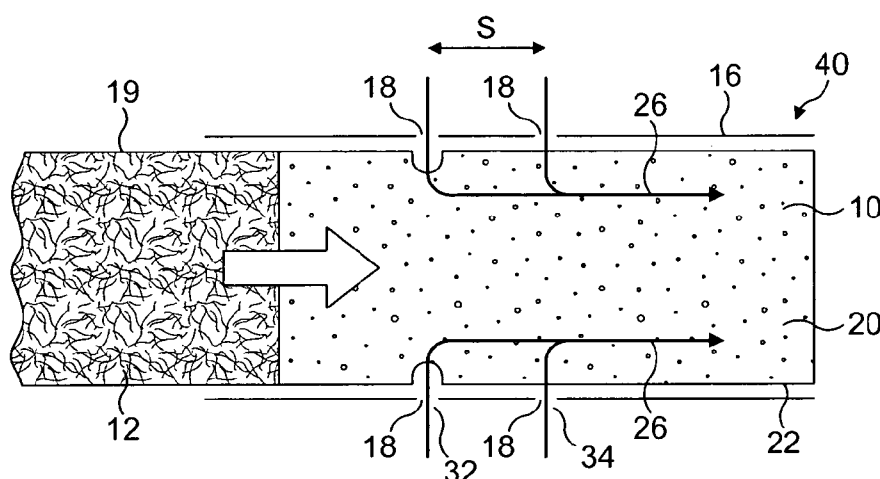
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(54) Title: VENTILATED SMOKING ARTICLE



**FIG. 1**

(57) Abstract: A smoking article (40) comprising a filter core (20), a wrapper (22) surrounding the filter core, a first group (32) of ventilation holes and a second group (34) of ventilation holes positioned closer to a mouth end of the smoking article than the first group of ventilation holes, wherein at least the first group of ventilation holes extend through the wrapper into the core.

## Ventilated Smoking Article

### Field of the Invention

The present invention relates to ventilation holes in a smoking article.

5

### Background

Prefabricated smoking articles that comprise a tobacco rod attached to a filter, such as cigarettes and superslim cigarettes, often include ventilation holes in the filter.

The purpose of the holes is to allow air to enter the filter when a smoker draws on the cigarette. The air mixes with the smoke and other components drawn through the filter from the ignited tobacco and provides dilution.

There are a range of techniques currently used for making ventilation holes. The tipping paper, which is wrapped around the cigarette to join the tobacco rod to the filter, may be pre-perforated before wrapping by a mechanical or electrostatic perforating device or by a laser beam. Alternatively, a laser beam may be used to make the holes after the cigarette is assembled, using an on-line or on-machine-line (OML) system. In the latter case, the holes are burnt into the filter by the focused laser beam, and hence pass through the paper or papers wrapped around the filter (tipping paper, wrapping paper) and into the acetate tow from which the filter core is made. In all cases, the result is to allow the diluting air to be drawn into the outside regions of the filter. Recently an OML system for generating ventilation holes which penetrate deep into the cigarette filter (deep vent OML; DVOML) has been developed. The location of the holes along the filter length can modify the filtering and dilution effects, in particular if the holes are positioned with reference to individual components of a multi-segment filter.

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### Summary of the Invention

According to the invention, there is provided a smoking article comprising a filter core, a wrapper surrounding the filter core, a first group of ventilation holes and a second group of ventilation holes positioned closer to a mouth end of the smoking article than the first group of ventilation holes, wherein at least the first group of ventilation holes extend through the wrapper into the core.

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The second group of ventilation holes may extend through the wrapper into the core.

The second group of ventilation holes may not extend into the filter core.

5

One of the first or second groups of ventilation holes may comprise a deeper group of ventilation holes and the other of the first or second group of ventilation holes may comprise a shallower group of ventilation holes.

10 The deeper group of ventilation holes may be arranged such that air drawn in through the deeper group of holes enters a central region of the filter core.

The depth of the deeper group of ventilation holes may be at least 25% of a diameter of the filter core, for example between 25% and 50% of a diameter of the  
15 filter core.

The depth of the deeper group of ventilation holes may be at least 2mm, for example between 2mm and 3.5mm.

20 The deeper group of ventilation holes may be manufactured using DVOML technology.

The shallower group of ventilation holes may be arranged such that air drawn in through the holes enters a peripheral region of the filter core.  
25

The depth of the shallower group of ventilation holes may be between 1 and 10% of a diameter of the filter core, for example 10% of a diameter of the filter core or less.

The shallower group of ventilation holes may be manufactured using PP or OML  
30 technology.

The deeper group of ventilation holes may be the first group of ventilation holes and the shallower group of ventilation holes may be the second group of ventilation holes.

- 5 The filter core may comprise a plurality of filter sections.

The wrapper may comprise a porous tipping paper.

- 10 The wrapper may comprise a plurality of different papers with different gas permeabilities. The tipping paper may comprise two different tipping papers which do not substantially overlap. The wrapper may comprise a buccal proximal tipping paper which is substantially impermeable to gas diffusion, and a buccal distal tipping paper, which is porous to gases.

- 15 The first and second groups of ventilation holes may be arranged circumferentially as a single row or a narrow circumferential band of several circumferential rows.

- The smoking article may comprise smokeable material, which may include tobacco, a tobacco derivative, expanded tobacco, reconstituted tobacco or tobacco  
20 substitutes, or a heat-not-burn product. The smoking article may be a cigarette, which comprises a substantially cylindrical tobacco rod wrapped in cigarette paper and the filter.

- The function of the ventilation holes is to create differential flows through and  
25 across the filter, allowing the optimisation of filtration efficiencies, channelling of smoke through the filter, and the management of dilution and pressure drop through the filter. This is advantageous because in managing the flow of smoke in this fashion, the efficiency of the filtration of the gaseous flow is increased, largely because the smoke is effectively travelling a longer path through the filter, and is  
30 spread more evenly throughout the filter material and therefore a greater proportion of the unwanted particulate matter substances are removed. The overall effect is that increased filtration efficiency is obtained.

This smoke management feature of the invention has the advantage of maintaining a high pressure difference providing satisfaction for the smoker, while simultaneously facilitating a high level of smoke dilution, with minimal risk of occlusion.

- 5 The ventilation holes may be located in a zone around the circumference of the filter, approximately 11 to 18 mm from the mouth end of the filter. The second group of ventilation holes, closer to the mouth end of the filter, may be approximately 12 mm from the mouth end of the filter. The first group of ventilation holes, closer to the smokeable material end of the filter, may be  
10 approximately 17 mm from the mouth end of the filter. The distance between the first and second groups of ventilation holes may be 5 mm or more.

The smoking article according to the invention provides a reduced concentration of harmful particulate matter and gas phase substances in the smoke delivered to the  
15 smoker by introducing ambient air into the gaseous flow whenever the smoker inhales on the smoking article. This approach to reducing the concentration of harmful gas phase components has several associated advantages. In particular, the consumer continues to receive the desired components and associated taste effects of the gaseous flow. Furthermore, the cooler ambient air lowers the temperature of  
20 the smoke entering the mouth and throat, producing a more pleasant and agreeable smoking effect.

The provision of the two groups of ventilation holes provides increased smoke dilution whilst maintaining a high pressure difference (PD) when the smoker  
25 imparts sucking effort on the smoking article, since external air must be drawn through substantially the entire length of the filter. In this way, an elevated PD is established relative to cigarettes with an equivalent level of smoke dilution.

The smoking article according to the invention provides an increased filtration and  
30 dilution of smoke. In particular, the two groups of ventilation holes provide increased dilution of gaseous flow with ambient air whilst reducing the probability of occlusion of the holes by a smoker's mouth or fingers. The filtration of smoke to

remove total particulate matter is maximised, and the PD is maintained at a high level.

### **Brief Description of the Drawings**

- 5 For a fuller understanding of the invention, embodiments of the invention will now be described with reference to the accompanying drawings in which:

Figure 1 is a cross sectional view through a smoking article comprising a first group of upstream ventilation holes having air conduits into a filter core, and a second  
10 group of downstream ventilation holes which do not.

Figure 2 is a cross sectional view through a smoking article having a multi section filter comprising three filter sections, and further having a first group of upstream ventilation holes having air conduits into the filter core and a second group of  
15 downstream ventilation holes which do not.

Figure 3 is a cross sectional view through a smoking article similar to that shown in Figure 2, comprising a porous tipping paper and a non-porous tipping paper.

20 Figure 4 is a cross sectional view through a smoking article comprising a first group of upstream ventilation holes having air conduits into a filter core, and a second group of downstream ventilation holes having air conduits into the filter core of approximately the same depth as the ventilation holes of the first group.

25 Figure 5 is a cross sectional view through a smoking article comprising a first group of upstream ventilation holes having air conduits into a filter core, and a second group of downstream ventilation holes having air conduits into the filter core which are shallower than the air conduits of the first group.

30 Figure 6 is a cross sectional view through a smoking article comprising a first group of upstream ventilation holes having air conduits into a filter core, and a second group of downstream ventilation holes having air conduits into the filter core which are deeper than the air conduits of the first group.

### Detailed Description

Figure 1 shows a smoking article 40 comprising a filter 10. The filter 10 comprises a substantially cylindrical filter core 20 wrapped in a plug wrap 22 around its  
5 circumferential surface. The smoking article also comprises a cylindrical rod of smokeable material 12 aligned with the filter 10 such that the end of the tobacco rod 12 abuts the end of the filter 10. The tobacco rod is wrapped in a paper wrapper 19, and is joined to the filter 10 by tipping paper 16 in a conventional manner. In the example shown in Figure 1 the smoking article is a cigarette and the smokeable  
10 material is tobacco. The filter core 20 comprises a cylindrical core of filter material having a buccal proximal end, or mouth end, and a smokeable material end.

The filter core 20 may comprise one or a plurality of abutted cylindrical filter sections made of similar or different filter materials, as shown in Figure 2.  
15 Alternatively, the filter core 20 may comprise a single section comprising a continuous length of filter material as shown in Figure 1. The filter material may be formed from cellulose acetate tow, but may alternatively or additionally comprise carbonaceous material, for example, activated charcoal, a resin material such as amberlite or duolite, and/or catalytic material. The filter section(s) may be  
20 composed of materials with equal or different pressure drop capacities. In the example shown in Figure 2 the filter comprises three longitudinally aligned sections of filter medium 3, 4, 5 wrapped in porous plug wrap 22, and tipping paper 16.

25 The tipping paper may consist of one or a plurality of different types of papers, which may have different porosities to air and other gases, and may differ with regards other specific properties such as propensity to absorb moisture. According to the example shown in Figure 3, two types of tipping paper 16, 17 are used. The two filter sections 3, 4 proximal to the tobacco rod 12 are wrapped in porous  
30 tipping paper 16 through which vapours and gases such as carbon monoxide can diffuse. Clearly some external air will also be drawn into the filter through this porous tipping paper 16. In the example of Figure 3, the filter portion 5 adjacent to the mouth end of the filter is wrapped in an unperforated, essentially impervious

tipping paper 17. However, in the example shown in Figure 1, only porous tipping paper 16 is used to wrap the filter core 20.

As shown in Figure 1, the tipping paper 16 serves to attach the filter 10 to the tobacco rod 12. This attachment may be by a conventional means such as an adhesive layer between the tipping paper 16 and the paper wrapper 19 surrounding the tobacco rod 12. In alternative embodiments the filter 10 and rod of smokeable material 12 may be attached by any other suitable means.

Referring again to Figure 1, ventilation holes 18 in the filter allow ambient air 26 to become drawn into the filter core 20 upon inhalation by the smoker. In this example, the filter 10 is ventilated by means of two groups 32, 34 of ventilation holes 18. Each ventilation hole 18 may comprise a perforation in the wrapper 16, 22 surrounding the filter core 20. For example, in Figure 1 the perforations penetrate the porous tipping paper 16 and plug wrap 22. The ventilation holes 18 may further comprise an air conduit in the filter material to allow air to be drawn towards the centre of the filter core 20 to mix with the smoke 28 drawn from the smokeable material 12. This is explained in more detail below.

The first and second groups 32, 34 of ventilation holes 18 may be arranged circumferentially as a single row or a narrow band of several rows. As shown in Figure 1, a first group 32 of ventilation holes 18 may be located substantially towards the boundary between the filter 10 and tobacco rod 12, whilst a second group 34 may be situated closer to the mouth end of the filter 10, in a more buccal proximal position.

In one example, the first group 32 of ventilation holes 18 may be located between the longitudinal midpoint of the filter 10 and the smokeable material end of the filter 10. The second group 34 of ventilation holes 18 may be located between the longitudinal midpoint of the filter 10 and the mouth end of the filter 10.

The ventilation holes 18 may be located in a zone around the circumference of the filter 10, approximately 11 to 18 mm from the mouth end of the filter 10. In one

example, the second group 34 of ventilation holes 18 may be approximately 12 mm from the mouth end of the filter 10. The first group 32 of ventilation holes 18 may be approximately 17 mm from the mouth end of the filter 10. The longitudinal distance S between the first and second groups 32, 34 of ventilation holes 18 may be 5 mm or more. The diameter of the ventilation holes 18 may be between 10 $\mu$ m and 100 $\mu$ m. Alternatively, the diameter of the ventilation holes 18 may be between 100 $\mu$ m and 1mm, or between 1mm and 2mm, depending on the method of manufacture.

10 In the example shown in Figure 1, each group of ventilation holes 18 is arranged as a single circumferential row. If the filter is a multi-section filter, the perforations for the first group 32 of ventilation holes 18 may be aligned with the filter section 3 which is proximal to the tobacco rod 12, whilst the perforations for the second group 34 of ventilation holes 18 may be aligned with the central filter section 4.

15 In one example of the invention both sets of perforations puncture both the porous tipping paper 16 and the plug wrap 22 such that air is able to pass directly into the filter core 20. Alternatively, the buccal proximal, or mouth end perforations may only pierce the porous tipping paper 16. However, air may still be able to pass into 20 the filter material through the perforation due to the porous nature of the plug wrapping paper 22.

Upon inhalation by the smoker, smoke is drawn along the tobacco rod 12 and diluted in the filter 10 with ambient air that is drawn into the filter 10 via the two 25 groups 32, 34 of ventilation holes 18. Ambient air may also be drawn into the filter 10 through the porous tipping paper 16. The volume of air drawn through the porous tipping paper 16 may be small in comparison to that drawn through the ventilation holes 18.

30 The first and second groups 32, 34 of ventilation holes 18 may not be identical. For example, one group 32, 34 of ventilation holes 18 may be pre-perforated (PP) using an array of pins, or may be manufactured using OML technology. The other group may be manufactured using DVOML technology. The PP or OML group 32, 34 of

ventilation holes 18 may penetrate only the tipping paper 16 or the tipping paper 16 and plug wrap 22, whilst the DVOML group of ventilation holes 18 may additionally include an air conduit which penetrates deep into the filter material 20 towards the centre of the filter core. More detailed examples are described below.

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Referring to Figure 1, in one example the first group 32 of ventilation holes 18, closer to the smokeable material, comprise perforations in the tipping paper 16 and plug wrap 22, and an air conduit which extends into the filter core 20 towards the centre of the filter core 20. The second group 34 of ventilation holes 18 comprise only perforations in the tipping paper 16 and plug wrap 22. The depth of the air conduits in the first group 32 of ventilation holes 18 may be relatively shallow, for example 1% to 5% of the diameter of the filter 10, or 5% to 10% of the diameter of the filter 10. Ambient air is introduced into the filter material through the ventilation holes 18 when a smoker draws on the smoking article.

15

Dividing the ventilation zone between two longitudinally spaced groups of ventilation holes 18 provides an advantage over the use of a single band of ventilation holes because some of the ventilation is moved away from the mouth end of the smoking article, thereby reducing the probability of ventilation being prevented by occlusion. The use of two groups 32, 34 may also be used to increase the overall level of ventilation, since a greater number of holes may be provided.

20

Referring to Figure 4, in another example each of the ventilation holes 18 in both of the first group 32 and the second group of ventilation holes 18 comprise a perforation in the tipping paper 16 and plug wrap 22, and an air conduit which extends into the filter core 20 towards the centre of the filter core 20. As with the example shown in Figure 1, the depth of the air conduit may be relatively shallow, for example 1% to 5% of the diameter of the filter 10, or 5% to 10% of the diameter of the filter 10.

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A further example is shown in Figure 5, in which the first group 32 of ventilation holes 18 penetrate both the porous tipping paper 16, the plug wrap 22 and extend deep into the filter core section 3 proximal to the smokeable material such that each

ventilation hole 18 comprises an air conduit which extends towards the diametric centre of the core of filter material. In this example, the first group 32 of ventilation holes 18 may be made using a DVOML system. However, alternative methods may be used. The air conduits of the first group 32 of ventilation holes 18 may have a  
5 depth of at least 2 mm. Alternatively, the first group 32 of ventilation holes 18 may each have a depth of between 2mm and 3.5 mm. Each of the first group 32 of ventilation holes 18 may alternatively have a depth that is at least 25% of the diameter of the filter 10 and may have a maximum depth of 50% of the diameter of the filter 10.

10

As such, air which is drawn into the filter 10 through the first group 32 of ventilation holes when a smoker draws on the smoking article 18 will enter the filter material substantially towards the diametric centre 12 of the filter core 20. This has the effect of concentrating the tobacco smoke 28 towards peripheral areas of the  
15 filter material, i.e. close to the circumferential boundary of the core of filter material. Therefore, unwanted gases such as carbon monoxide can diffuse through the porous tipping paper 16 and porous plug wrap 22 more readily than would be the case in a standard filter construction due to the increased concentration of these gases near the surface of the filter. This reduces the concentration of unwanted  
20 gases reaching the smoker at the mouth end of the filter.

Referring again to Figure 5, in this example the second group 34 of ventilation holes 18 comprise perforations in the tipping paper 16 and plug wrap 22, and a relatively shallow air conduit into the filter core 20 in comparison to the first group 32 of  
25 ventilation holes 18. As such, the second group 34 of ventilation holes 18 introduce ambient air into diametrically peripheral areas of the filter core 20 when the smoker draws on the smoking article. This has the effect of reducing the relative concentration of the tobacco smoke 28 at the peripheral areas. Some of the tobacco smoke 28 will be forced into a more central position in the filter core 20 and further  
30 mix with the air that was drawn into the filter 10 through the first group 32 of ventilation holes 18.

The depth of the air conduits of the second group 34 of ventilation holes 18 may be, for example 1% to 5% of the diameter of the filter 10, or 5% to 10% of the diameter of the filter 10. Alternatively, the second group 34 of ventilation holes 18 may comprise only perforations in the tipping paper 16 and plug wrap 22, without  
5 air conduits into the filter core 20. In this example, the second group 34 of ventilation holes 18 may be formed using OML technology.

The combination of first and second groups of ventilation holes creates a diffusion zone at the exterior surface of the filter 10. In the example of Figure 5, the  
10 diffusion zone is located between the first group 32 of ventilation holes 18 and the second group of ventilation holes 32. In the example of Figure 6, described in more detail below, the diffusion zone is located between the second group 34 of ventilation holes 18 and the mouth end of the filter 10. In the example of both  
Figures 5 and 6, in the diffusion zone, smoke 28 is concentrated at the periphery of  
15 the smokeable material in the filter core 20 and may diffuse out of the core 20 through the porous plug wrap 22 and tipping paper 16.

Referring to Figure 6, in a further example the first group 32 of ventilation holes 18 may comprise perforations in the tipping paper 16 and plug wrap 22, and a relatively  
20 shallow air conduit into the filter core 20. The first group of ventilation holes 18 will therefore introduce ambient air into diametrically peripheral areas of the filter core 20 when the smoker draws on the smoking article. This has the effect of reducing the relative concentration of the tobacco smoke at the peripheral areas. Some of the tobacco smoke will be forced into a more central position in the filter  
25 core 20, and some of the smoke may diffuse out of the filter 10 through the porous plug wrap 22. The depth of the air conduits of the first group 32 of ventilation holes 18 may be, for example 1% to 5% of the diameter of the filter 10, or 5% to 10% of the diameter of the filter 10. In this example, the first group 32 of ventilation holes 18 may be formed using OML technology.

30

The second group 34 of ventilation holes 18 may penetrate both the porous tipping paper 16, the plug wrap 22 and extend deep into the filter core section 3 proximal to the smokeable material such that each ventilation hole 18 comprises an air

conduit which extends towards the diametric centre of the core of filter material. In this example, the second group 34 of ventilation holes 18 may be made using a DVOML system. However, alternative methods may be used. The second group 34 of ventilation holes 18 may have a depth of at least 2 mm. Alternatively, the second  
5 group 34 of ventilation holes 18 may have a depth of between 2mm and 3.5 mm. The second group 34 of ventilation holes 18 may have a depth that is at least 25% of the diameter of the filter 10 and may have a maximum depth of 50% of the diameter of the filter 10.

10 In the example of Figure 6, the second group 34 of ventilation holes 18 may therefore have the effect of concentrating the tobacco smoke towards peripheral areas of the filter material, i.e. close to the circumferential boundary of the core of filter material. Therefore, unwanted gases such as carbon monoxide can diffuse through the porous tipping paper 16 and porous plug wrap 22 more readily than  
15 would be the case in a standard filter construction due to the increased concentration of these gases near the surface of the filter. This reduces the concentration of unwanted gases reaching the smoker at the mouth end of the filter.

The first and second groups 32, 34 of ventilation holes 18 create differential  
20 gaseous flows through and across the filter 10, allowing the optimisation of filtration efficiencies, channelling of smoke through the filter 10, and the management of dilution and pressure drop through the filter 10. Furthermore, the majority of the ventilation occurs away from the buccal proximal end, or mouth end, of the filter 10, thus minimising the risk of occlusion by the smoker.  
25 Above is described what is believed to be the preferred embodiments of the invention. However, those skilled in the art will recognise that changes and modifications may be made without departing from the scope of the invention.

**Claims**

1. A smoking article comprising:  
a filter core;  
5 a wrapper surrounding the filter core;  
a first group of ventilation holes; and  
a second group of ventilation holes positioned closer to a mouth end of the  
smoking article than the first group of ventilation holes,  
wherein at least the first group of ventilation holes extend through the  
10 wrapper into the core.
2. A smoking article according to claim 1 wherein the second group of  
ventilation holes extend through the wrapper into the core.
- 15 3. A smoking article according to claim 1 wherein the second group of  
ventilation holes do not extend into the filter core.
4. A smoking article according to any one of claims 1 to 3 wherein one of the  
first or second groups of ventilation holes comprises a deeper group of ventilation  
20 holes and the other of the first or second group of ventilation holes comprises a  
shallower group of ventilation holes.
5. A smoking article according to claim 4, wherein the deeper group of  
ventilation holes are arranged such that air drawn in through the deeper group of  
25 holes enters a central region of the filter core.
6. A smoking article according to any one of claims 4 or 5, wherein the depth  
of the deeper group of ventilation holes is between 25% and 50% of a diameter of  
the filter core.  
30
7. A smoking article according to any one of claims 4 to 6, wherein the depth  
of the deeper group of ventilation holes is between 2mm and 3.5mm.

8. A smoking article according to any one of claims 4 to 7, wherein the deeper group of ventilation holes are manufactured using DVOML technology.

9. A smoking article according to any one of claims 4 to 8, wherein the  
5 shallower group of ventilation holes are arranged such that air drawn in through the holes enters a peripheral region of the filter core.

10. A smoking article according to any one of claims 4 to 9, wherein the depth of the shallower group of ventilation holes is 10% of a diameter of the filter core or  
10 less.

11. A smoking article according to any one of claims wherein 4 to 10, wherein the shallower group of ventilation holes are manufactured using PP or OML technology.  
15

12. A smoking article according to any one of claims 4 to 11, wherein the deeper group of ventilation holes are the first group of ventilation holes and the shallower group of ventilation holes are the second group of ventilation holes.

20 13. A smoking article according to any of the preceding claims wherein the filter core comprises a plurality of filter sections.

14. A smoking article according to any of the preceding claims wherein the wrapper comprises a porous tipping paper.  
25

15. A smoking article according to any preceding claim, wherein the wrapper comprises a buccal proximal tipping paper which is substantially impermeable to gas diffusion, and a buccal distal tipping paper, which is porous to gases.

30 16. A smoking article according to any of the preceding claims wherein the first and second groups of ventilation holes are arranged circumferentially as a single row or a narrow circumferential band of several circumferential rows.

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

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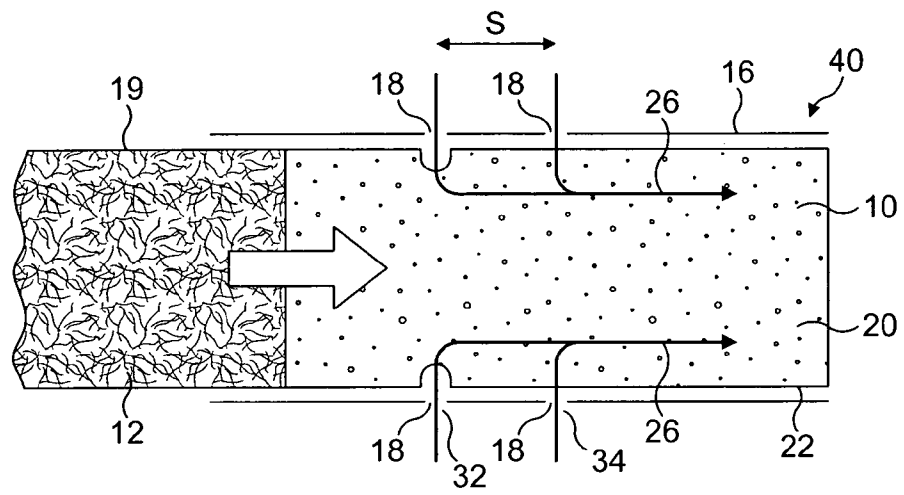


FIG. 1

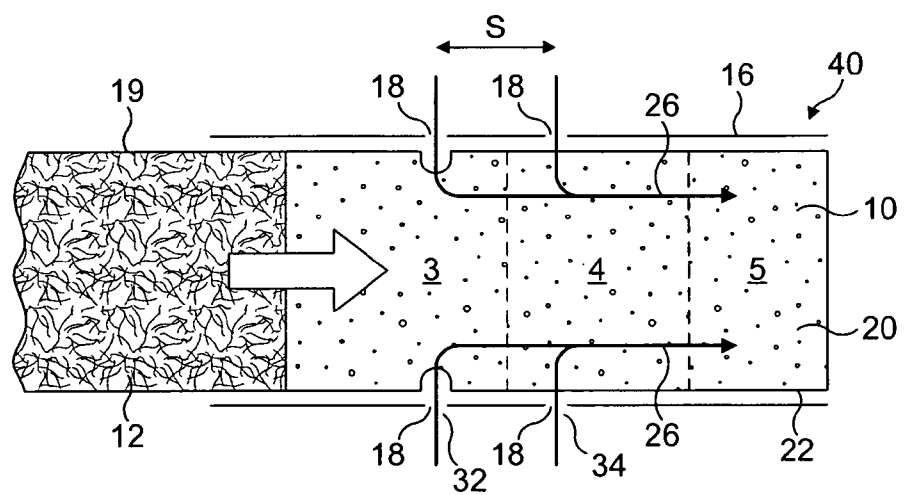


FIG. 2

2 / 3

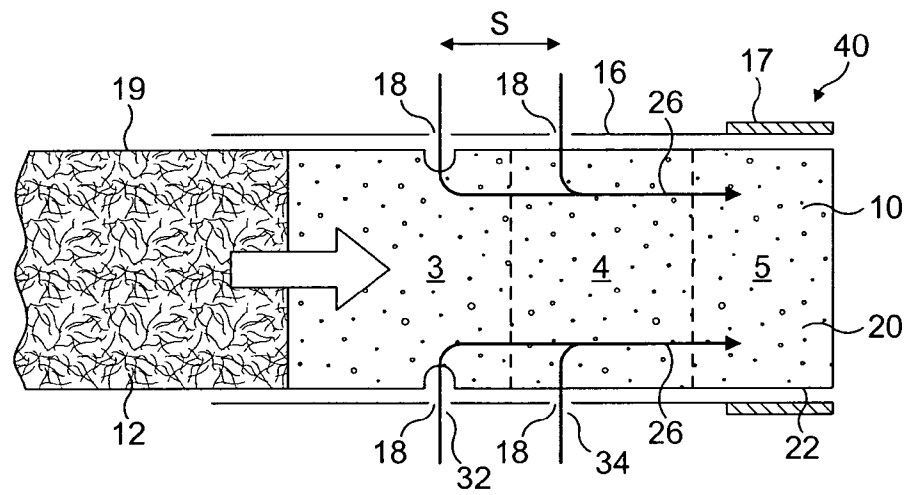


FIG. 3

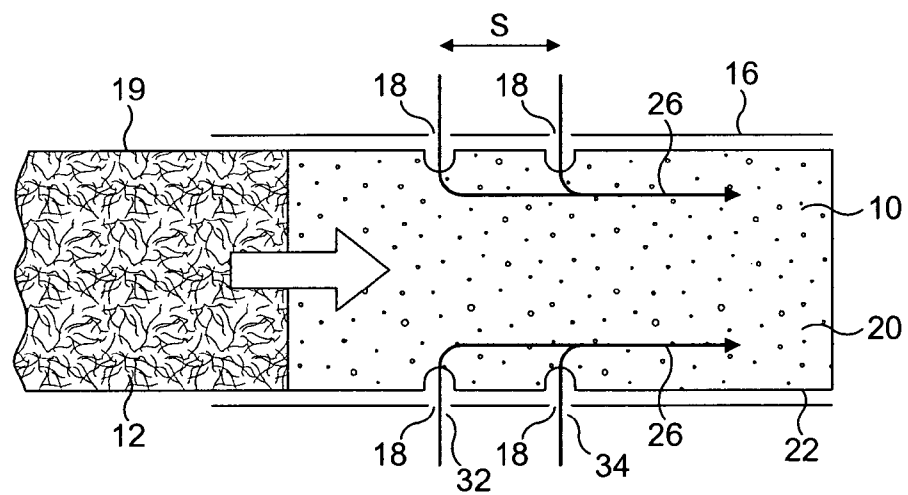


FIG. 4

3 / 3

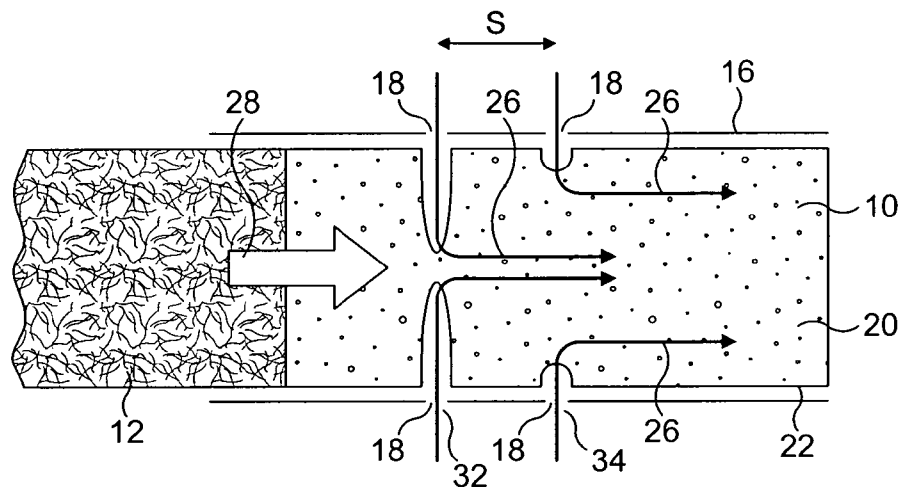


FIG. 5

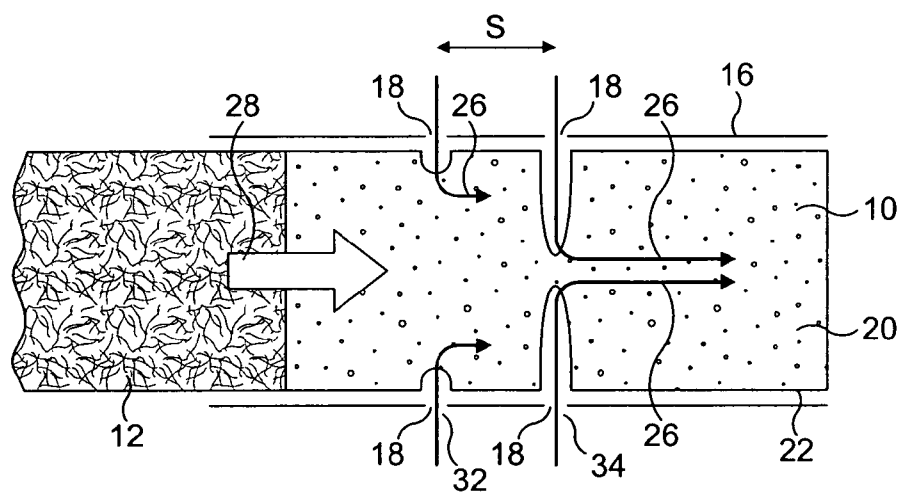


FIG. 6

# INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2009/068000

## A. CLASSIFICATION OF SUBJECT MATTER

INV. 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

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category*     | Citation of document, with indication, where appropriate, of the relevant passages                                                                                             | Relevant to claim No. |
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| X,P           | WO 2009/144499 A2 (BRITISH AMERICAN<br>TOBACCO CO [GB]; FIEBELKORN RICHARD [GB];<br>ELGAR GLEN) 3 December 2009 (2009-12-03)<br>page 10, line 14 - line 19; claims;<br>figures | 1-17                  |
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| A             | GB 2 150 414 A (BROWN & WILLIAMSON<br>TOBACCO) 3 July 1985 (1985-07-03)<br>the whole document                                                                                  | 1-17                  |
| -----<br>-/-- |                                                                                                                                                                                |                       |

☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

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International application No

PCT/EP2009/068000

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Information on patent family members

International application No

PCT/EP2009/068000

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