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(54) SMOKING ARTICLE WITH TWO OR MORE FILTER SEGMENTS

RAUCHARTIKEL MIT ZWEI ODER MEHREREN FILTERABSCHNITTEN

ARTICLE À FUMER AVEC DEUX OU PLUSIEURS SEGMENTS DE FILTRE

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Description

[0001] The present invention relates to a smoking article that can be adjusted to provide different levels of taste intensity.

[0002] Filter cigarettes typically comprise a rod of tobacco cut filler surrounded by a paper wrapper and a cylindrical filter aligned in end-to-end relationship with the wrapped tobacco rod, with the filter attached to the tobacco rod by tipping paper. In conventional filter cigarettes, the filter may consist of a plug of cellulose acetate tow wrapped in porous plug wrap. Filter cigarettes with multi-component filters that comprise two or more segments of filtration material for the removal of particulate and gaseous components of the mainstream smoke are also known.

[0003] It has previously been proposed to provide smoking articles which may be adapted by the consumer in order to vary the flavour intensity of the mainstream smoke delivered during smoking. For example, it is known to provide a smoking article in which the ventilation of the smoking article can be varied in order to vary the dilution of the mainstream smoke. By varying the level of dilution of the mainstream smoke, it is possible for the consumer to select a desired flavour intensity. In other known examples, the filter of the smoking article may be manipulated by the consumer in order to vary the filtering properties of the smoking article and the resultant taste intensity. CH 467 031 A1 also describes a filter having multiple segments which can be selectively removed by a consumer before or during smoking.

[0004] It would be desirable to provide a novel smoking article having improved means for providing a number of different taste levels so that the consumer can readily adjust the taste intensity of the mainstream smoke, prior to smoking. It would be particularly desirable if such a smoking article could be constructed in a simple and cost effective way so that it is possible to manufacture the smoking articles at relatively high speeds and volumes.

[0005] According to the present invention there is provided a smoking article comprising: a tobacco rod circumscribed by an outer wrapper having a plurality of perforations extending through the wrapper; and a filter comprising two or more filter segments in axial alignment with each other, wherein adjacent filter segments of the filter abut at an interface. The two or more filter segments are at least partially circumscribed by a substantially air impermeable plug wrap. A filter wrapper circumscribes a portion of the filter and an adjacent portion of the tobacco rod to connect the filter and the tobacco rod. The filter wrapper includes one or more circumferential lines of weakness extending around the filter at a position corresponding to the position of an interface. The substantially air impermeable plug wrap extends around the interface under the one or more circumferential lines of weakness such that the smoking article provides two or more different tar levels between 0.1 mg and 15 mg, wherein the tar level is determined when the smoking article is smoked under ISO conditions, and such that the levels of carbon monoxide delivery for each tar level are within 1 mg of each other, wherein the level of carbon monoxide delivery is determined when the smoking article is smoked under ISO conditions.

[0006] Smoking articles according to the invention provide an effective way for the consumer to vary the taste intensity of the smoking article between two or more discrete levels. The provision of circumferential lines of weakness at the location of each interface between adjacent filter segments enables the filter segments to be separated from each other by breaking the filter wrapper along the lines of weakness. By removing one or more filter segments at the mouth end of the filter from the remainder of the smoking article, the length of the filter may be varied in order to alter the taste intensity of the mainstream smoke delivered during smoking. As one or more filter segments are removed from the mouth end of the filter, the overall length of the filter is reduced and less of the particulate phase of the smoke is removed by the filter. The resultant taste intensity increases as a result of the increased particulate phase delivery in the mainstream smoke.

[0007] The consumer can therefore choose to increase the taste intensity of the mainstream smoke delivered by a smoking article according to the invention by breaking off one or more filter segments from the mouth end of the filter. This provides the consumer with greater control and variety in the smoking experience that can be delivered from a single cigarette design.

[0008] The number of discrete taste levels available to the consumer can be changed by adapting the number of filter segments in the filter. In general, the number of available taste levels corresponds to the number of filter segments so that additional, discrete taste levels can be incorporated through the addition of filter segments. For example, smoking articles according to the invention having two filter segments can provide two different taste levels and smoking articles according to the invention having three filter segments can provide three different taste levels.

[0009] Preferably, the filter of smoking articles according to the invention comprises three filter segments in axial alignment with each other, thereby providing two interfaces. The term "interface" is used in the present specification to define the area or plane where adjacent filter segments abut one another, such that the ends of the filter segments come into contact with each other. In certain filter arrangements, adjacent filter segments may not be in contact with each other but may be separated by a narrow space or cavity. In this case, the one or more lines of weakness in the filter wrapper extend around the filter at a position corresponding to the space between the adjacent filter segments.

[0010] The construction of the filter of smoking articles according to the invention allows consumers to choose between two or more discrete taste levels and to achieve the desired taste level with a simple manipulation of the filter to remove one or more filter segments from the mouth end of the filter. The arrangement of the present invention facilitates the

variation in the taste of the mainstream smoke compared with the more complicated arrangements of the prior art. Furthermore, in smoking articles according to the invention, the taste levels are well defined such that consistent taste levels can be provided to the consumer with all smoking articles having the same arrangement of filter segments. Smoking articles according to the invention provide two or more different tar levels between about 0.1 mg and about 15 mg, between about 0.1 mg and about 10 mg, between about 1 mg and about 15 mg, more preferably between about 4 mg and about 12 mg, wherein the tar level is determined when the smoking article is smoked under ISO conditions (35ml puffs lasting 2 seconds each, every 60 seconds). The term 'tar level' or 'particulate phase delivery' is used to refer to the total nicotine free dry particulate matter (NFDPM) of a smoking article under ISO conditions.

[0011] In one preferred embodiment in which the filter comprises three filter segments, the smoking article provides three available tar levels of about 8 mg, about 10 mg and about 12 mg, wherein the higher levels of about 10 mg and about 12 mg are achieved by breaking off one and two segments, respectively. Other tar levels that may be provided by the cigarette are about 1 mg, about 2 mg, about 4 mg, and about 6 mg. Where the filter has three or more available tar levels, the intervals between the tar delivery levels may be the same. For example, the intervals between the tar levels may be about 1 mg, about 2mg, about 3 mg, or about 4 mg. In other cases, the intervals between the three or more available tar levels may be different.

[0012] The plug wrap circumscribing the two or more filter segments of smoking articles according to the invention is substantially air impermeable. The substantially air impermeable plug wrap may circumscribe the filter along all or a part of its length but is arranged so that the interfaces between adjacent filter segments are covered by the plug wrap.

[0013] The term 'substantially air impermeable' is used in relation to the present invention to describe a sheet material that, when incorporated into the filter, allows less than 10% dilution of the mainstream smoke through the ingress of ambient air into the filter. The substantially air impermeable plug wrap may be non porous and does not include any perforations. Preferably, the substantially air impermeable plug wrap has an air permeability of less than 200 Coresta units, preferably less than 100 Coresta units, and more preferably less than 20 Coresta units. In some such cases, the substantially air impermeable plug wrap can have a lower limit of 1 Coresta unit.

[0014] The 'Coresta' unit is the unit of air permeability of a sheet material, which corresponds to the flow of air (cubic centimetres per minute) passing through a 1 square centimetre surface area of the test material at a measuring pressure of 1.00 kPa. The measuring pressure is the difference in pressure between the two faces of the test material during measurement. As such, the units corresponding to the Coresta unit are cubic centimetres per minute per square centimetre ($cm^3min^{-1}cm^{-2}$) at 1.00 kPa. A suitable method for determining the air permeability of sheet materials for use in the present invention is described in ISO Standard 2965:2009.

[0015] The air permeability in Coresta units (CU) for a test piece is calculated using the formula:

$$CU = [Q/A] \times [1/d]$$

where Q is the measured air flow, in cubic centimetres per minute, passing through the test piece, A is the surface area, in square centimetres, of the test piece, and d is the actual measure of pressure difference, in kilopascals, across the two surfaces of the test piece.

[0016] The inclusion of a substantially air impermeable plug wrap over the interfaces between the adjacent filter segments ensures that the one or more lines of weakness in the filter wrapper have a minimal effect on the ventilation of the filter. Instead, the required ventilation is provided by the plurality of perforations in the outer wrapper of the tobacco rod.

[0017] The positioning of the ventilation on the tobacco rod rather than the filter advantageously ensures that the overall level of dilution of the mainstream smoke can be controlled and maintained at a predetermined level, including when one or more filter segments are removed in order to vary the taste level. The ventilation on the tobacco rod is substantially unaffected by the removal of filter segments so that a consistent level of ventilation can be provided for each taste level. In contrast, if ventilation was provided on the filter, for example by the lines of weakness in the filter wrapper, the level of ventilation would be significantly affected by the removal of the filter segments and it would generally not be possible to provide a controlled level of ventilation for all of the taste levels.

[0018] In addition, in certain embodiments, the positioning of the ventilation on the tobacco rod ensures that the carbon monoxide (CO) delivery of smoking articles according to the invention is relatively consistent at each of the different taste levels. The carbon monoxide delivery is therefore substantially unaffected by the removal of one or more filter segments in order to adjust the tar level. The levels of carbon monoxide delivery for each taste level are within about 1 mg of each other, more preferably within about 0.3 mg and more preferably within about 0.1 mg. The level of carbon monoxide delivery is determined when the smoking article is smoked under ISO conditions.

[0019] In order to break off a filter segment from the remainder of the filter, the filter wrapper is broken along the one or more lines of weakness at the interface and the underlying substantially air impermeable plug wrap must also be torn

or separated along the interface. Preferably, in order to facilitate the breakage of the substantially air impermeable plug wrap at an interface, the substantially air impermeable plug wrap is formed of a sheet material having a low basis weight. Preferably, the substantially air impermeable plug wrap is formed of a plastic, such as a polylactic acid (PLA) film. The plastic plug wrap may have a basis weight of less than about 70 grams per square metre (gsm), more preferably less than about 40 gsm. The substantially air impermeable plug wrap may alternatively be formed of a paper material having a basis weight of less than about 25 gsm, more preferably less than about 20 gsm.

[0020] The filter wrapper connecting the filter to the tobacco rod is preferably a tipping wrapper, such as a tipping paper of the type used in conventional smoking articles. The filter wrapper is provided with one or more lines of weakness at the position or positions corresponding to each interface between adjacent filter segments.

[0021] In the context of the present invention, when the one or more lines of weakness 'correspond' to a position of one of the interfaces it is meant that the line of weakness is within about 2 mm of the interface. Preferably, the one or more lines of weakness are within about 1 mm of the interface, or more preferably within about 0.5 mm.

[0022] Similarly, in filters where adjacent filter segments are separated by a space or cavity, the one or more lines of weakness are preferably provided at a position corresponding to the space between adjacent filter segments. Preferably, the one or more lines of weakness are therefore provided within about 2 mm of the space, more preferably within about 1 mm of the space, or more preferably within about 0.5 mm.

[0023] Preferably, the one or more lines of weakness in the filter wrapper are formed by one or more circumferential rows of perforations. For example, each line of weakness may be formed by a row of micro laser perforations. Preferably, each row of perforations comprises between 10 and 20 holes per centimetre, more preferably about 15 holes per centimetre. Typically, the filter wrapper for use in smoking articles according to the invention will be pre-perforated prior to being wrapped around the smoking articles. The position of the rows of perforation on the filter wrapper can be controlled so that the position corresponds to the position of the interfaces in the filter. Suitable apparatus and methods for perforating the filter wrapper will be known to the skilled person.

[0024] The outer wrapper circumscribing the tobacco rod is preferably a paper cigarette wrapper, of the type used in conventional smoking articles. The outer wrapper is provided with a plurality of perforations. The perforations may be provided in one or more rows extending circumferentially around the tobacco rod. Alternatively, the perforations may be uniformly or non-uniformly distributed over an area of the outer wrapper. Typically, the outer wrapper for use in smoking articles according to the invention will be pre-perforated prior to being wrapped around the tobacco rod. Preferably, the outer wrapper comprises a plurality of electrostatic perforations.

[0025] Preferably, the outer wrapper has an air permeability that allows at least 20% air dilution through the cigarette rod, more preferably at least 50% and most preferably at least 75%. For example, the outer wrapper may be perforated to provide an air permeability of at least 200 Coresta units, more preferably at least 350 Coresta units. An upper limit for the Coresta units of the outer wrapper may be determined by the required strength and other attributes of the wrapper. As an example, the air permeability may be less than 2000 Coresta units, preferably less than 700 Coresta units, or more preferably less than 500 Coresta units.

[0026] The total ventilation in the smoking article preferably provides air dilution of the mainstream smoke of at least about 20%, more preferably at least about 50% and more preferably at least about 75%. As described above, the filter preferably provides less than 10% dilution as a result of the substantially impermeable plug wrap. The majority of the air dilution is therefore provided by the ventilation in the outer wrapper of the tobacco rod.

[0027] The two or more filter segments of smoking articles according to the invention may take a variety of forms and suitable filter segments will be known to the skilled person. The two or more filter segments may be of the same construction and materials as each other or may have a different construction, or contain different filtration material or additives. Preferably, the two or more filter segments are each formed of a plug of fibrous filtration material, such as cellulose acetate tow or paper. Each segment may also comprise a plurality of sections, or sub-segments. For example, one or more of the filter segments may comprise two or more sections or sub-segments disposed between the lines of weakness in the filter wrapper.

[0028] Where the two or more filter segments are formed of plugs of fibrous filtration material, the filter segments may have the same or different filament denier, total denier, or both. The filament denier of the fibrous filtration material of the filter segments may be between about 1.5 and 8. The total denier of the fibrous filtration material of the filter segments may be between about 15,000 and 50,000. Preferably, the filter segments at the mouth end of the filter have a lower filament denier, or smaller diameter fibres, than the filter segments closer to the tobacco rod. Preferably, the total denier of the filter segments at the mouth end of the filter is higher than the filter segments closer to the tobacco rod. In this case, the mouth end filter segment has a higher linear density that the upstream segment or segments.

[0029] The resistance to draw (RTD) of the smoking articles of the present invention will vary depending on the number and length of the filter segments and the taste level selected by the consumer. Preferably, the RTD of the smoking article with all of the filter segments intact is between about 90 and 130 mm H_2O. Each of the two or more filter segments contributes to the overall RTD of the smoking article and the filter segments may have the same or different RTD values. Preferably, each filter segment has an RTD value between about 10 mm H_2O and 50 mm H_2O. Preferably, the RTD of

the two or more filter segments increases towards the mouth end of the filter, such that the mouth end filter segment has a higher RTD that the upstream filter segment or segments.

[0030] The resistance to draw of a smoking article, filter or filter segment refers to the static pressure difference between the two ends of the specimen when it is traversed by an air flow under steady conditions in which the volumetric flow is 17.5 millilitres per second at the output end. The RTD of a specimen can be measured using the method set out in ISO Standard 6565:2002.

[0031] One or more of the filter segments or sub-segments may include a particulate material. The particulate material is preferably incorporated in an upstream filter segment, for example, in a rod end filter segment.

[0032] The particulate material may be dispersed through a plug of 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, the filter may include a filter segment with a hollow cavity at least partially filled with a particulate material. In such embodiments, the hollow cavity is preferably provided between two plugs of a filtration material to form a filter segment, for example a mouth end filter segment downstream of the cavity and a rod end filter segment upstream of the cavity.

[0033] 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.

[0034] 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, for example menthol. 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.

[0035] Alternatively, one, two or more, or all of the segments may have a liquid flavourant such as menthol applied directly to the filtration material.

[0036] Preferably, the overall length of smoking articles according to the present invention with all filter segments intact is between about 70 mm and about 128 mm, more preferably about 84 mm.

[0037] Preferably, the external diameter of smoking articles according to the present invention is between about 5 mm and 8.5 mm, more preferably about 7.9 mm.

[0038] Preferably, the overall length of the filters of smoking articles according to the invention with all filter segments intact is between about 18 mm and about 36 mm, more preferably about 27 mm.

[0039] The length of each individual filter segment of the filters is preferably between about 5 mm and about 22 mm. The two or more filter segments may be the same length as each other, or different lengths. Preferably, the filter segment at the mouth end of the filter is between about 3 mm and about 12 mm, more preferably between about 5 mm and about 10 mm. A first interface between the mouth end filter segment and an adjacent, upstream filter segment is therefore preferably positioned between about 5 mm and about 10 mm from the mouth end of the filter. A second interface between adjacent filter segments is preferably provided between about 10 mm and about 20 mm from the mouth end of the filter.

[0040] Smoking articles according to the present invention may be packaged in containers, for example in soft packs or hinge-lid packs, with an inner liner coated with one or more flavourants.

[0041] The invention will now be further described by way of example only with reference to the accompanying drawings, in which:

Figure 1 shows a perspective view of a smoking article according to the invention; and
Figure 2 shows a perspective view of the smoking article of Figure 1, with the filter unwrapped.

[0042] The filter cigarette 10 shown in Figures 1 and 2 comprises a wrapped rod 12 of tobacco cut filler, which is attached to an axially aligned filter 14. As shown in Figure 2, the filter 14 comprises three filter segments in abutting end-to-end relationship: a mouth end segment 16, distant from the wrapped tobacco rod 12; a central filter segment 18, located upstream of the mouth end segment 16; and a rod end segment 20, located upstream of the central filter segment 18 and adjacent to and abutting the wrapped tobacco rod 12.

[0043] The mouth end segment 16 of the filter 14 comprises a plug of cellulose acetate tow which is 7 mm in length and which has a filament denier of 1.5 and a total denier of 46,000. The resistance to draw (RTD) of the mouth end segment is 38 mm H_2O. The central filter segment 18 comprises a plug of cellulose acetate tow which is 10 mm in length and which has a filament denier of 3.4 and a total denier of 34,000. The RTD of the central filter segment is 33 mm H_2O. The rod end segment 20 comprises a plug of cellulose acetate tow which is 10 mm in length and which has a filament denier of 8.0 and a total denier of 28,000. The RTD of the rod end segment is 12 mm H_2O. The overall RTD of the filter

is 27 mm H_2O.

[0044] The mouth end segment 16 and the central filter segment 18 abut each other at a first interface 22 which is located 7 mm from the mouth end of the cigarette 10. The central filter segment 18 and the rod end filter segment 20 abut each other at a second interface 24 which is located upstream from the first interface 22, 17 mm from the mouth end of the cigarette 10.

[0045] The combined filter segments are wrapped with a substantially air impermeable plug wrap 26, which circumscribes the entire length of the filter 14. The substantially air impermeable plug wrap 26 is formed from a substantially non-porous paper material of a low basis weight.

[0046] The tobacco rod 12 is 57 mm in length and has a resistance to draw (RTD) of 35 mm H_2O. The tobacco rod 12 is wrapped with a cigarette paper (not shown), which circumscribes the entire length of the rod. The cigarette paper is electrostatically perforated to achieve an air permeability of around 320 Coresta units.

[0047] The wrapped tobacco rod 12 and the wrapped filter 14 are joined by an outer tipping wrapper 28, which circumscribes the entire length of the filter 14 and an adjacent portion of the tobacco rod 12 and overlies the substantially air impermeable plug wrap 26. The tipping wrapper 28 is formed of a tipping paper that has been pre-perforated to form two rows of perforations 30a and 30b. The perforations are positioned on the tipping wrapper 28 so that when the tipping wrapper 28 is wrapped around the filter 14, a first row of perforations 30a extends circumferentially around the filter at a position coinciding with the first interface 22 between the mouth end segment 16 and the central filter segment 18. A second row of perforations 30b extends circumferentially around the filter at a position coinciding with the second interface 24 between the central filter segment 18 and the rod end segment 20. Each row of perforations 30a, 30b includes around 15 holes per centimetre.

[0048] The cigarette 10 may be smoked with the three filter segments intact, as shown in Figures 1 and 2. Alternatively, in order to intensify the taste of the mainstream smoke, the mouth end segment 16 may be separated from the remainder of the smoking article by breaking the tipping wrapper 28 and the underlying substantially air impermeable plug wrap 26 along the first row of perforations 30a to break off the mouth end segment 16. The resultant smoking article may then be smoked with the central filter segment 18 and the rod end segment 20 in place. Alternatively again, in order to intensify the taste of the mainstream smoke still further, both the mouth end segment 16 and the central filter segment 18 may be broken off by breaking the tipping wrapper 28 and the underlying substantially air impermeable plug wrap 26 along the second row of perforations 30b. The resultant smoking article may then be smoked with only the rod end segment 20 in place.

[0049] The table below shows the delivery of tar, nicotine and carbon monoxide (CO) as well as the RTD for each length of smoking article.

Filter segments	All three segments	Central Rod end	Rod end
Length (mm)	84	77	67
RTD (mm H_2O)	116	79	46
Puff count	5.7	5.6	5.6
Tar delivery (mg)	8.1	9.9	12.0
Nicotine delivery (mg)	0.7	0.8	0.95
CO delivery (mg)	8.6	8.5	8.6

[0050] As illustrated by the table above, the cigarette 10 provides three discrete tar levels of about 8 mg, 10 mg and 12 mg. If the consumer desires the lowest available tar level, the cigarette 10 can be smoked without any changes and with all three filter segments intact. In order to increase the tar level and provide a more intense taste during smoking, the consumer can choose to remove the mouth end segment only, or both the mouth end segment and the rod end segment, as described above. At the same time, as shown in the above table, placement of the ventilation in the cigarette rod provides a consistent level of CO delivery (within 0.1 mg) between the different filter lengths.

Claims

1. A smoking article (10) comprising:

a tobacco rod (12) circumscribed by an outer wrapper;
a filter (14) comprising two or more filter segments in axial alignment with each other wherein adjacent filter

segments abut at an interface (22,24), wherein the two or more filter segments are at least partially circumscribed by a plug wrap (26); and
a filter wrapper (28) circumscribing a portion of the filter (14) and an adjacent portion of the tobacco rod (12) to connect the filter (14) and the tobacco rod (12), wherein the filter wrapper (28) includes one or more circumferential lines of weakness (30a,30b) extending around the filter (14) at a position corresponding to the position of the interface (22,24) and wherein the substantially air impermeable plug wrap (26) extends around the interface (22,24) under the one or more circumferential lines of weakness (30a,30b), **characterized in that** the outer wrapper has a plurality of perforations extending through the outer wrapper, **in that** the plug wrap (26) is substantially air impermeable and **in that** the smoking article (10) is configured such that the smoking article (10) provides two or more different tar levels between 0.1 mg and 15 mg wherein the tar level is determined when the smoking article (10) is smoked under ISO conditions and such that the levels of carbon monoxide delivery for each tar level are within 1 mg of each other, wherein the level of carbon monoxide delivery is determined when the smoking article (10) is smoked under ISO conditions.

2. A smoking article (10) according to claim 1 wherein the filter (14) comprises three filter segments in axial alignment with each other and two interfaces (22,24).

3. A smoking article (10) according to claim 1 or 2 wherein the basis weight of the substantially air impermeable plug wrap (26) is less than 70 grams per square metre.

4. A smoking article (10) according to any preceding claim wherein the porosity of the substantially air impermeable plug wrap (26) is less than 10 Coresta units.

5. A smoking article (10) according to any preceding claim wherein the substantially air impermeable plug wrap (26) comprises a plastic film.

6. A smoking article (10) according to any preceding claim wherein the outer wrapper is perforated to provide an air permeability of at least 200 Coresta units.

7. A smoking article (10) according to any preceding claim wherein the one or more circumferential lines of weakness (30a,30b) in the filter wrapper (28) are formed by one or more circumferential rows of perforations and wherein each row of perforations comprises between 10 and 20 holes per centimetre.

8. A smoking article (10) according to any preceding claim wherein one or more filter segments comprises a particulate material.

9. A smoking article (10) according to claim 8 wherein the particulate material is provided in a rod end filter segment.

10. A smoking article (10) according to any preceding claim wherein the perforations in the outer wrapper of the tobacco rod (12) are evenly distributed across the outer wrapper.

11. A smoking article (10) according to any preceding claim wherein the one or more circumferential lines of weakness (30a,30b) in the filter wrapper (28) are each positioned within 2 mm of an interface (22,24).

12. A smoking article (10) according to any preceding claim wherein the substantially air impermeable plug wrap (26) extends along the entire length of the filter (14).

13. A smoking article (10) according to any preceding claim wherein the total ventilation in the smoking article (10) provides at least 20% air dilution of the mainstream smoke during smoking of the smoking article (10) under ISO conditions.

Patentansprüche

1. Raucherartikel (10), aufweisend:

einen Tabakstock (12), der durch eine äußere Umhüllung abgegrenzt ist;
einen Filter (14), der zwei oder mehr Filtersegmente in axialer Ausrichtung miteinander aufweist, wobei angren-

zende Filtersegmente an einer Grenzfläche (22, 24) anliegen, wobei die zwei oder mehr Filtersegmente mindestens teilweise durch eine Einsatzumhüllung (26) abgegrenzt sind; und
eine Filterumhüllung (28), die einen Abschnitt des Filters (14) und einen angrenzenden Abschnitt des Tabakstocks (12) abgrenzt, um den Filter (14) und den Tabakstock (12) zu verbinden, wobei die Filterumhüllung (28) eine oder mehrere umlaufende Schwächelinien (30a, 30b) einschließt, die sich um den Filter (14) herum an einer Position, die der Position der Grenzfläche (22, 24) entspricht, erstrecken, und wobei sich die im Wesentlichen luftundurchlässige Einsatzumhüllung (26) um die Grenzfläche (22, 24) unter der einen oder den mehreren umlaufenden Schwächelinien (30a, 30b) erstreckt,
dadurch gekennzeichnet, dass die äußere Umhüllung mehrere Perforationen aufweist, die sich durch die äußere Umhüllung erstrecken, und dass die Einsatzumhüllung (26) im Wesentlichen luftundurchlässig ist und der Raucherartikel (10) derart konfiguriert ist, dass der Raucherartikel (10) zwei oder mehr verschiedene Teergehalte zwischen 0,1 mg und 15 mg bereitstellt, wobei der Teergehalt bestimmt wird, wenn der Raucherartikel (10) unter ISO-Bedingungen und derart geraucht wird, dass die Niveaus an Kohlenmonoxidabgabe für jeden Teergehalt innerhalb von 1 mg voneinander liegen, wobei das Niveau an Kohlenmonoxidabgabe bestimmt wird, wenn der Raucherartikel (10) unter ISO-Bedingungen geraucht wird.

2. Raucherartikel (10) nach Anspruch 1, wobei der Filter (14) drei Filtersegmente in axialer Ausrichtung miteinander und zwei Grenzflächen (22, 24) aufweist.

3. Raucherartikel (10) nach Anspruch 1 oder 2, wobei das Basisgewicht der im Wesentlichen luftundurchlässigen Einsatzumhüllung (26) kleiner als 70 Gramm pro Quadratmeter ist.

4. Raucherartikel (10) nach einem der vorstehenden Ansprüche, wobei die Porosität der im Wesentlichen luftundurchlässigen Einsatzumhüllung (26) kleiner als 10 Coresta-Einheiten ist.

5. Raucherartikel (10) nach einem der vorstehenden Ansprüche, wobei die im Wesentlichen luftundurchlässige Einsatzumhüllung (26) einen Kunststofffilm aufweist.

6. Raucherartikel (10) nach einem der vorstehenden Ansprüche, wobei die äußere Umhüllung perforiert ist, um eine Luftdurchlässigkeit von mindestens 200 Coresta-Einheiten bereitzustellen.

7. Raucherartikel (10) nach einem der vorstehenden Ansprüche, wobei die eine oder die mehreren umlaufenden Schwächelinien (30a, 30b) in der Filterumhüllung (28) durch eine oder mehrere Umfangsreihen von Perforationen gebildet sind, und wobei jede Reihe von Perforationen zwischen 10 und 20 Öffnungen pro Zentimeter aufweist.

8. Raucherartikel (10) nach einem der vorstehenden Ansprüche, wobei ein oder mehrere Filtersegmente Feststoffe aufweisen.

9. Raucherartikel (10) nach Anspruch 8, wobei die Feststoffe in einem Stockendefiltersegment vorgesehen sind.

10. Raucherartikel (10) nach einem der vorstehenden Ansprüche, wobei die Perforationen in der äußeren Umhüllung des Tabackstocks (12) gleichmäßig über die äußere Umhüllung verteilt sind.

11. Raucherartikel (10) nach einem der vorstehenden Ansprüche, wobei die eine oder die mehreren umlaufenden Schwächelinien (30a, 30b) in der Filterumhüllung (28) jeweils innerhalb von 2 mm einer Grenzfläche (22, 24) positioniert sind.

12. Raucherartikel (10) nach einem der vorstehenden Ansprüche, wobei sich die im Wesentlichen luftundurchlässige Einsatzumhüllung (26) entlang der Gesamtlänge des Filters (14) erstreckt.

13. Raucherartikel (10) nach einem der vorstehenden Ansprüche, wobei die gesamte Luftzufuhr im Raucherartikel (10) mindestens 20 % Luftverdünnung des Hauptstromrauchs während des Rauchens des Raucherartikels (10) unter ISO-Bedingungen bereitstellt.

Revendications

1. Article à fumer (10) comprenant :

une tige de tabac (12) entourée par une enveloppe extérieur ;
un filtre (14) comprenant deux ou plusieurs segments de filtre en alignement axial les uns avec les autres, où des segments de filtre adjacents butent contre une interface (22, 24), où les deux ou plusieurs segments de filtre sont au moins partiellement entourés par une enveloppe de filtre (26) ; et
une enveloppe de filtre (28) entourant une partie du filtre (14) et une partie adjacente de la tige de tabac (12) pour raccorder le filtre (14) et la tige de tabac (12), où l'enveloppe de filtre (28) comporte une ou plusieurs lignes de faiblesse circonférentielles (30a, 30b) s'étendant autour du filtre (14) à une position correspondant à la position de l'interface (22, 24) et où l'enveloppe de bout (26) essentiellement imperméable à l'air s'étend autour de l'interface (22, 24) en dessous de l'une ou plusieurs lignes circonférentielles d'affaiblissement (30a, 30b),
caractérisé en ce que l'enveloppe extérieur a une pluralité de perforations s'étendant à travers l'enveloppe extérieur et **en ce que** l'enveloppe de bout (26) est essentiellement imperméable à l'air et **en ce que** l'article à fumer (10) est configuré de sorte que l'article à fumer (10) fournit deux ou plusieurs niveaux de goudron différents entre 0,1 mg et 15 mg, où le niveau de goudron est déterminé lorsque l'article à fumer (10) est fumé conformément aux conditions ISO et de manière que les niveaux de libération de monoxyde de carbone pour chaque niveau de goudron soient à un niveau de 1 mg l'un avec l'autre, où le niveau de libération de monoxyde de carbone est déterminé lorsque l'article à fumer (10) est fumé conformément aux conditions ISO.

2. Article à fumer (10) selon la revendication 1, dans lequel le filtre (14) comprend trois segments de filtre en alignement axial les uns avec les autres et deux interfaces (22, 24).

3. Article à fumer (10) selon la revendication 1 ou 2, dans lequel le poids de base de l'enveloppe de filtre (26) essentiellement imperméable à l'air est inférieur à 70 grammes par mètre carré.

4. Article à fumer (10) selon l'une quelconque des revendications précédentes, dans lequel la porosité de l'enveloppe de filtre (26) essentiellement imperméable à l'air est inférieure à 10 unités Coresta.

5. Article à fumer (10) selon l'une quelconque des revendications précédentes, dans lequel l'enveloppe de filtre (26) essentiellement imperméable à l'air comprend un film plastique.

6. Article à fumer (10) selon l'une quelconque des revendications précédentes, dans lequel l'enveloppe extérieur est perforée pour fournir une perméabilité à l'air d'au moins 200 unités Coresta.

7. Article à fumer (10) selon l'une quelconque des revendications précédentes, dans lequel l'une ou plusieurs lignes de faiblesse circonférentielles (30a,30b) dans l'enveloppe de filtre (28) sont formées par une ou plusieurs rangées de perforations circonférentielles et dans lequel chaque rangée de perforations comprend entre 10 et 20 trous par centimètre.

8. Article à fumer (10) selon l'une quelconque des revendications précédentes, dans lequel un ou plusieurs segments de filtre comprennent un matériau particulaire.

9. Article à fumer (10) selon la revendication 8, dans lequel le matériau particulaire est fourni dans un segment de filtre d'extrémité de tige.

10. Article à fumer (10) selon l'une quelconque des revendications précédentes, dans lequel les perforations dans l'enveloppe extérieur de la tige de tabac (12) sont distribuées de manière uniforme à travers l'enveloppe extérieur.

11. Article à fumer (10) selon l'une quelconque des revendications précédentes, dans lequel l'une ou plusieurs lignes de faiblesse circonférentielles (30a, 30b) dans l'enveloppe de filtre (28) sont positionnées chacune à 2 mm d'une interface (22, 24).

12. Article à fumer (10) selon l'une quelconque des revendications précédentes, dans lequel l'enveloppe de filtre (26) essentiellement imperméable à l'air s'étend le long toute la longueur du filtre (14).

13. Article à fumer (10) selon l'une quelconque des revendications précédentes, dans lequel la ventilation totale dans l'article à fumer (10) fournit au moins 20% de dilution d'air dans le courant de fumée principal lorsque l'on fume l'article à fumer (10) conformément aux conditions ISO.

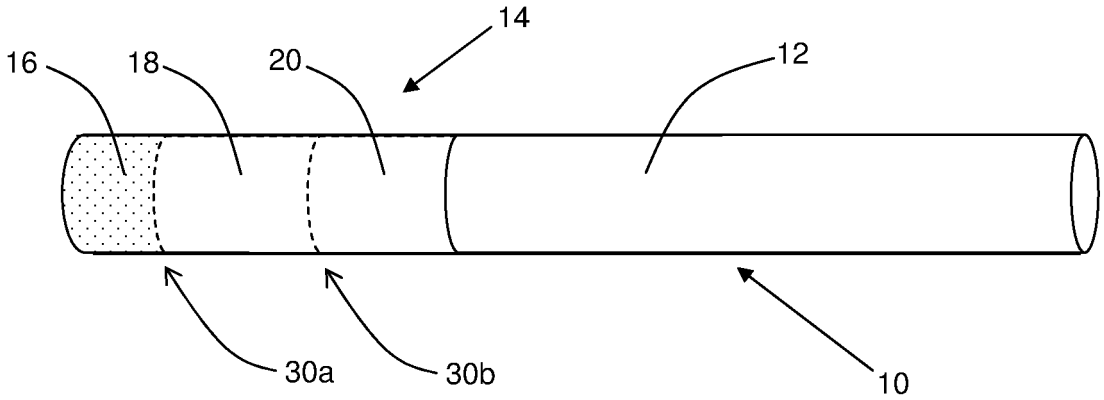


Figure 1

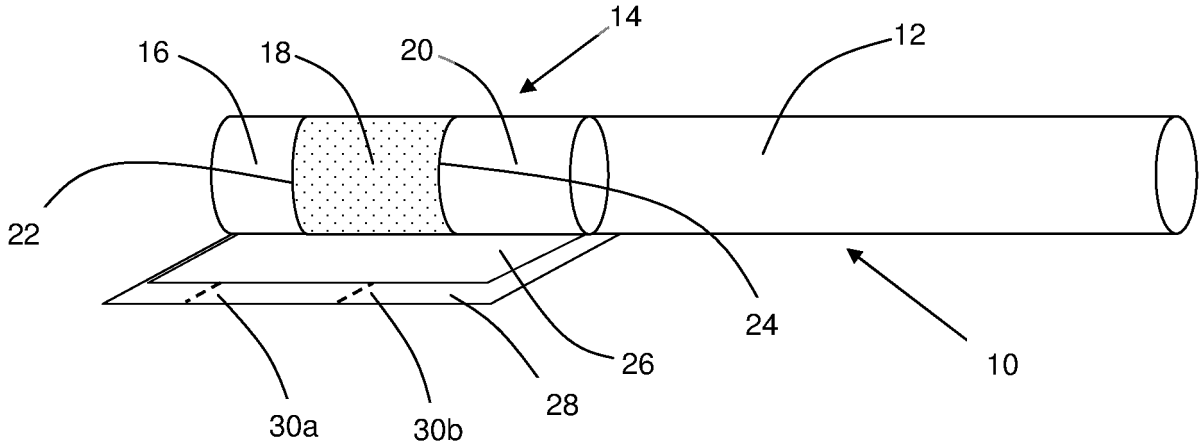


Figure 2

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- CH 467031 A1 **[0003]**
- EP 1958523 A **[0034]**