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(54) **Concentric smoking filter having discrete tow and web filter media.**

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Description

Background of the Invention

This invention relates to smoking filters, and particularly to concentric smoking filters as claimed in the first part of claim 1; see prior art of US-A-3 396 061. More particularly, this invention relates to concentric smoking filters having tow and web filter media portions arranged concentrically.

Most smoking filters, particularly cigarette filters, sold commercially as part of cigarettes consist of a cylindrical rod or "plug" of a "tow" of plasticized cellulose acetate fibers. Some filters are variants of the standard filter, having recessed mouth ends, or being made of two plugs placed end-to-end with a space in between, the space being either empty or filled with another material such as charcoal. It is also known to provide such filters having multiple plugs abutting one another, the different plugs differing in density or other characteristics.

Similarly, it is known to provide filtering media other than cellulose acetate. One such medium is an appropriate sheet or web material. The web material, which is gathered into a cylindrical plug, can be paper or any other web material, including cellulose acetate in sheet form. When such web materials are used as filters, they are frequently corrugated before being gathered. Paper webs may also be creped to improve tensile strength.

Some of these different materials and different constructions have been combined. For example, it is known to provide filters having two or more abutting plugs, at least one of which is cellulose acetate tow, and at least one of which is a web material.

Finally, it is known to provide "concentric filters" in which two different forms of cellulose acetate tow -- differing, e.g., in density -- are formed in to a filter. One cellulose acetate tow forms a cylindrical "core", while the other tow forms an annular peripheral layer.

Smoking filters are characterized by various parameters, including pressure drop, which is referred to as resistance-to-draw ("RTD") and usually measured as the height of a column of water, and efficiency, which is measured as the percentage of the total particulate matter ("TPM") in the unfiltered smokestream that is trapped by the filter. The RTD of a filter affects how smokers perceive the filter in terms of how hard they must draw on it to receive a desired amount of smoke, while the filter efficiency controls the amount of TPM delivered in the smoke.

It has been found that while web filters, and particularly paper filters, are more efficient than tow filters, the web material, especially paper, adds an off taste to the smoke which decreases smoker satisfaction. In addition, the appearance of the visible deposited smoke components on the end of a paper filter is much less regular, and more spotty, than on a cellulose acetate tow filter, again affecting the aesthetic impact on the smoker. This difference in appearance is believed to result from the channelling of deposited material in the channels formed by the corrugation and gathering of the web during plug making.

As consumer preferences tend toward lower delivery cigarettes, the need for higher efficiency filters, which allow lower delivery without increased filter RTD, increases. However, the higher efficiency of paper filters could not previously be taken advantage of because of the negative consumer impacts of paper filters.

It would be desirable to be able to provide a high efficiency filter which produced low delivery while also delivering acceptable taste, RTD and other aesthetic impacts.

Summary of the Invention

It is an object of this invention to provide a high efficiency filter which produces low delivery while also delivering acceptable taste, RTD and other aesthetic impacts.

In accordance with this invention, there is provided a smoking filter comprising a first filter plug having a central core of a first filter material and a peripheral layer of a second filter material surrounding the central core. One of the first and second filter materials is cellulose acetate tow and the other of the first and second filter materials is a gathered corrugated web material. When the filter is attached to a smoking article and delivers, when the smoking article is smoked, a particular level of total particulate matter, the taste of the smoking article is a taste associated with a level of total particulate matter higher than that particular level.

Brief Description of the Drawings

The above and other objects and advantages of the invention will be apparent upon consideration of the following detailed description, taken in conjunction with the accompanying drawings, in which like reference characters refer to like parts throughout, and in which:

FIG. 1 is a mouth end perspective view of a cigarette having a first embodiment of a filter according to the present invention;

FIG. 2 is a radial cross-sectional view of the filter of FIG. 1;

FIG. 3 is a mouth end perspective view of a cigarette having a second embodiment of a filter according to the present invention;

FIG. 4 is a radial cross-sectional view of the filter of FIG. 3;

FIG. 5 is a mouth end perspective view of a cigarette having a third embodiment of a filter according to the present invention; and

FIG. 6 is a mouth end perspective view of a cigarette having a fourth embodiment of a filter according to the present invention.

Detailed Description of the Invention

In accordance with the present invention, it has unexpectedly been found that when a concentric filter is made with paper or other web material in the core, and cellulose acetate tow in the periphery, or vice-versa, not only is high filtration efficiency achieved without the introduction of an off taste from the paper, but a cigarette with low TPM delivery can be produced which has the taste of a cigarette with a higher TPM delivery.

As shown in FIGS. 1 and 2, cigarette 10 includes a tobacco rod 11 and a first preferred embodiment of a filter 12 according to this invention. Tobacco rod 11 is wrapped in conventional wrapper 13, while filter 12 is wrapped by conventional tipping 14. Filter 12 includes cellulose acetate tow peripheral layer 20 and central paper core 21. Cellulose acetate peripheral layer 20 is a conventional cellulose acetate tow, preferably wrapped by porous plug wrap 22, although self-supporting filter rod technology, such as steam bonding or spray coating of the outer surface of peripheral layer 20, can be used to make a filter that need not be wrapped, if desired. Paper core 21 is a paper web that has been corrugated and gathered into cylindrical form and wrapped with plug wrap paper 23.

Plug wrap 23 improves the processibility of core 21 as well as its aesthetic appearance, and also helps to assure substantially perfect concentricity. Flavorants or other additives, such as soluble tobacco components, could be applied to plug wrap 23 to enhance the subjective impact of the filtered smoke. A similar result might be achieved by forming plug wrap 23 from a tobacco-containing material, such as reconstituted tobacco sheet. Plug wrap 23 is preferably porous, to allow smoke and air to freely move radially between peripheral layer 20 and core 21. At the same time, the presence of plug wrap 23 helps prevent channelling of smoke along the interface between peripheral layer 20 and core 21.

The most preferred embodiment of filter 12 has a circumference of about 24.45 mm and an average weight of about 258 mg. The cross-sectional area of core 21 preferably makes up about 60% of the total cross-sectional area of filter 12. Filter 12 preferably has an RTD of between about 130 mm W.G. and about 160 mm W.G., with the RTD of central core 21 being between about 350 mm W.G. and about 450 mm W.G.. More preferably, filter 12 has an RTD of about 146 mm W.G., with the RTD of central core 21 being about 400 mm W.G.

In the particularly preferred embodiment, the cellulose acetate tow of peripheral layer 20 is preferably an 8.0/30000 cellulose acetate tow having a denier per fiber of 8, a total denier of 30,000, and a "Y" cross-sectional shape. The web of core 21 is preferably a 100% cellulose semi-creped softwood pulp paper with 10% crosswise creping for added tensile strength. Such a paper is available from Tela Papierfabrik AG, of Balsthal, Switzerland.

Cigarette 10 is preferably ventilated to between about 65% and about 75% ventilation, and more preferably about 67% ventilation, with appropriate ventilation holes 15 provided in tipping 14. If the surface of filter 12 is not air permeable, appropriate holes would also be provided in filter 12.

FIGS. 3 and 4 show a cigarette 30 having a second preferred embodiment of filter 31 similar in construction to filter 12, except that core 40 is a tow material and peripheral layer 41 is a web material. Similarly, in this embodiment plug wrap 42 is necessary to contain the web material of peripheral layer 41, while plug wrap or other permeable wrap 43 around tow core 40 is optional, as tow core 40 could be made using self-supporting filter rod technology, as above.

The most preferred embodiment of filter 31 has a circumference of about 24.45 mm and an average weight of about 240 mg. The cross-sectional area of core 40 preferably makes up about 60% of the total cross-sectional area of filter 31. Filter 31 preferably has an RTD of between about 165 mm W.G. and about 195 mm W.G., with the RTD of central core 40 being between about 285 mm W.G. and about 385 mm W.G. More preferably, filter 31 has an RTD of about 182 mm W.G., with the RTD of central core 40 being about 334 mm W.G.

In this embodiment, the cellulose acetate tow of core 40 is preferably a 1.6/35000 cellulose acetate tow having a denier per fiber of 1.6, a total denier of 35,000, and a "Y" cross-sectional shape. The web of peripheral layer 41 is preferably the same 100% cellulose semi-creped softwood pulp paper, with 10% crosswise creping for added tensile strength, that is used in core 21 of filter 12.

Cigarette 30 is preferably ventilated to between about 65% and about 75% ventilation, and more preferably about 67% ventilation, with appropriate ventilation holes 15 provided in tipping 14, as in cigarette 10.

FIG. 5 shows a cigarette 50 having a third preferred embodiment of a filter 51 according to the invention. Filter 51 is a so-called "dual" filter, made up of two abutting filter segments 52, 53. Filter segment 52, which is adjacent tobacco rod 11, is a concentric filter as discussed above, in which one of core 54 and peripheral layer 55 is of a web material and the other of core 54 and peripheral layer 55 is of a tow material. Filter segment 53, which is at the mouth end, is a conventional tow filter, such as a cellulose acetate filter, and is provided primarily for cosmetic purposes. Nevertheless, segment 53 has filtration and RTD characteristics, and segment 52 must be adjusted so that the overall filter 51 has the desired characteristics.

In a preferred form of this embodiment, segment 52 is constructed like filter 12, but has a length of only 18-20 mm, while segment 53 is a 7-9 mm long plug of 2.6/42000 cellulose acetate for tow having a denier per fiber of 2.6, a total denier of 42,000, and a "Y" cross-sectional shape. Total filter RTD is between about 125 mm W.G. and about 175 mm W.G., preferably about 141 mm W.G. The RTD of segment 53 is between about 15 mm W.G. and about 45 mm W.G., preferably about 36 mm W.G. The RTD of segment 52 is between about 85 mm W.G. and about 175 mm W.G., preferably about 93 mm W.G. The RTD of the paper core 54 of segment 52 is between about 250 mm W.G. and about 450 mm W.G., preferably about 267 mm. W.G. Cigarette 50 made with this embodiment of filter 51 is ventilated to between about 65% and about 75% ventilation, preferably about 71% ventilation, with appropriate ventilation holes 15 in tipping 14.

FIG. 6 shows a cigarette 60 having a fourth embodiment of a filter 61 according to the invention. Filter 61 is a recessed filter, made up of filter segment 62 recessed into tipping 14 at 63. Filter segment 62, which is adjacent tobacco rod 11, is a concentric filter as discussed above, in which one of core 64 and peripheral layer 65 is of a web material and the other of core 64 and peripheral layer 65 is of a tow material.

The filter parameters discussed herein are given for 85 mm cigarettes. It is to be understood that filters according to the present invention can also be used with longer cigarettes. If a longer cigarette is provided, the filter parameters would have to be adjusted, in accordance with the knowledge of those skilled in the art.

EXAMPLE I

A filter according to the most preferred embodiment discussed above in connection with FIGS. 1 and 2, except that the tow in the peripheral layer was an 8.0/25000 cellulose acetate tow having a denier per fiber of 8.0 and a total denier of 25000, was prepared and mated to an "ultra-light" tobacco rod having the following characteristics:

Tobacco	487 mg
Total RTD	107 mm W.G.
Filter RTD	146 mm W.G.
Ventilation	67%
Tipping length	32.0 mm

The cigarette was smoked in a smoking machine under FTC conditions with the following results:

TPM	1.8 mg
Nicotine	0.16 mg
Water	0.21 mg
"Tar"	1.5 mg
Puff Count	6.2

The cigarette, which generates 1.5 mg of "tar", was also smoked by expert smokers, who reported that the cigarette had the taste of a cigarette that generates 4-5 mg of "tar". At 67% ventilation, the filter has an efficiency of about 76%. If there had been no ventilation, the efficiency would have been about 61%.

The cigarette also exhibited a pattern of visible deposition of filtrate on the end of the filter much more like a tow filter as opposed to a web filter, even though most of the filtrate was deposited on the web core. This is believed to be the result of the smoke being forced into core 21 as the ventilation air is introduced at holes 15, and then trying to spread back into peripheral tow layer 20 through permeable wrapper 23.

EXAMPLE II

A filter according to the preferred form of the embodiment of FIG. 5 was prepared and mated to an "ultra-light" tobacco rod having the following characteristics:

Tobacco	429 mg
Total RTD	93 mm W.G.
Filter RTD	141 mm W.G.
Ventilation	71%
Tipping length	32 mm

The cigarette was smoked in a smoking machine under FTC conditions with the following results:

TPM	1.6 mg
Nicotine	0.13 mg
Water	0.10 mg
"Tar"	1.4 mg
Puff Count	5.3

As in the case of Example I, this cigarette was smoked by expert smokers who reported that the cigarette had the taste of a cigarette that generates 4-5 mg of "tar".

The filter of this invention will improve the taste of low delivery cigarettes. It is also possible that the filter of this invention may offer similar performance at higher deliveries. For example, a medium delivery cigarette may be perceived as a full-flavor cigarette.

Thus it is seen that a high efficiency filter which produces low delivery while also delivering acceptable taste and other aesthetic impacts is provided.

Claims

1. A smoking filter comprising a filter plug (12,31,52,62) having a central core (21,40,54,64) of a first filter material, and a peripheral layer (20,41,55,65) of a second filter material surrounding said central core, one of said first and second materials being a fibrous tow and the other said first and second filter materials being a gathered corrugated web material, characterized in that said filter has a resistance-to-draw of between about 130mm W.G. and about 195mm W.G., said central core (21,40) having a resistance-to-draw of between about 285mm W.G. and about 450mm W.G.

2. The smoking filter of claim 1 wherein said first filter material (21) is said web material and said second filter material (20) is said fibrous tow.

3. The smoking filter of claim 2 wherein said second material is cellulose acetate tow having a denier per filament of about 8.0 and a total denier of from 25,000 to 30,000, preferably about 30,000.

4. The smoking filter of claim 1 wherein said first filter material (40) is said fibrous tow and said second filter material (41) is said web material.

5. The smoking filter of claim 4 wherein said first fibrous material is cellulose acetate tow having a denier per filament of about 1.6 and a total denier of about 35,000.

6. The smoking filter of any of claims 1 to 5 wherein said web material is paper.

7. The smoking filter of claim 6 wherein said paper is creped before being corrugated and gathered.

8. The smoking filter of any of claims 1 to 5 wherein said web material is a non-woven web.

9. The smoking filter of claim 8 wherein said non-woven web is cellulose acetate sheet.

10. The smoking filter of any of claims 1 to 9 wherein said gathered corrugated web material is wrapped in a plug wrap (23, 42).

11. The smoking filter of claim 10 wherein said plug wrap (23) is porous.

12. The smoking filter of claim 10 and 11 wherein said plug wrap (23) contains flavor components.

13. The smoking filter of claim 12 wherein said plug wrap (23) comprises a tobacco-containing material such as reconstituted tobacco sheet.

14. The smoking filter of claim 12 wherein said plug wrap (23) comprises plug wrap paper to which flavor components have been added, preferably soluble tobacco components.

15. The smoking filter of claim 1, 2, or 3 having a filtration efficiency of about 61% unventilated.

16. The smoking filter of any preceding claim having a ventilation rate of between 65% and 75%.

17. The smoking filter of any preceding claim wherein said core (21,40) has a cross-sectional area occupying about 60% of the total cross-sectional area of said filter.

18. The smoking filter of claim 1, 2 or 3 wherein said filter has a resistance-to-draw of about 146 mm W.G., said central core (21) having a resistance-to-draw of about 400 mm W.G.

19. The smoking filter of claim 1, 4 or 5 wherein said filter has a resistance-to-draw of between about 165 mm W.G. and about 195 mm W.G., said central core (40) having a resistance-to-draw of between about 285 mm W.G. and about 385 mm W.G.

20. The smoking filter of any of claims 1 to 17 further comprising a second filter plug (53) of cellulose acetate tow adjacent to the first-mentioned filter plug (52).

21. The smoking filter of claim 26 wherein said first filter material is said web material and said second filter material is said fibrous tow, said first filter plug (52) has a resistance-to-draw of between about 85 mm W.G., and about 175 mm W.G., said central core having a resistance-to-draw of between about 250 mm W.G., and about 450 mm W.G., and said second filter plug (53) has a resistance-to-draw of between about 15 mm W.G., and about 45 mm W.G., such that said filter has a resistance-to-draw of between about 125mm W.G., and about 175 mm W.G.

22. The smoking filter of any of claims 1 to 19 further comprising tipping (14) wrapped therearound, said tipping extending beyond one end of said filter plug (62) for attaching said filter to a cigarette and extending beyond the opposite end of said filter plug, forming a mouth-end recess in said filter.

23. The smoking filter of any of claims 1 to 18 wherein the peripheral layer (20) has a lower resistance-to-draw than the central core (21).

Patentansprüche

1. Raucherwaren-Filter, welcher einen Filterstopfen (12, 31, 52, 62) aufweist, welcher einen Mittelkern (21, 40, 54, 64) aus einem ersten Filtermaterial hat, und eine Umfangsschicht (20, 41, 55, 65) aus einem zweiten Filtermaterial hat, welche den Mittelkern umgibt, wobei einen der beiden Materialien ein Faserstrang ist und das andere der beiden Filtermaterialien ein zusammengezogenes, gewelltes Bahnmaterial ist, **dadurch gekennzeichnet**, daß der Filter einen zugwiderstand von zwischen etwa 130 mm Wassersäule und etwa 195 mm Wassersäule hat, und der Mittelkern (21, 40) einen zugwiderstand von zwischen etwa 285 mm Wassersäule und etwa 450 mm Wassersäule hat.

2. Rauchetwaren-Filter nah Anspruch 1, bei dem das erster Filtermaterial (21) das Bahnmaterial und das zweite Filtermaterial (20) der Faserstrang ist.

3. Raucherwaren-Filter nach Anspruch 2, bei dem das zweite Material ein Zelluloseacetatstrang ist, welcher ein Denier pro Filament von etwa 8,0 und eine Gesamt-Denier-Zahl von 25.000 bis 30.000, vorzugsweise etwa 30.000, hat.

4. Raucherwaren-Filter nach Anspruch 1, bei dem das erste Filtermaterial (40) der Faserstrang ist, und das zweite Filtermaterial (41) das Bahnmaterial ist.

5. Raucherwaren-Filter nach Anspruch 4, bei dem das erste Fasermaterial ein Zelluloseacetatstrang ist, welcher ein Denier pro Filament von etwa 1,6 und eine Gesamt-Denier-Zahl von etwa 35.000 hat.

6. Raucherwaren-Filter nach einem der Ansprüche 1 bis 5, bei dem das Bahnmaterial Papier ist.

7. Raucherwaren-Filter nach Anspruch 6, bei dem das Papier gekrept wird, bevor es gewellt und zusamengezogen wird.

8. Raucherwaren-Filter nach einem der Ansprüche 1 bis 5, bei dem das Bahnmaterial eine Vliesstoffbahn ist.

9. Raucherwaren-Filter nach Anspruch 8, bei dem die Vliesstoffbahn ein Zelluloseacetatflächengebilde ist.

10. Raucherwaren-Filter nach einem der Ansprüche 1 bis 9, bei dem das zusammengezogene, gewellte Bahnmaterial in eine Stopfenumhüllung (23, 42) gewickelt ist.

11. Raucherwaren-Filter nach Anspruch 10, bei dem die Stopfenumhüllung (23) porös ist.

12. Raucherwaren-Filter nach Anspruch 10 und 11, bei dem die Stopfenumhüllung (23) Aromastoffkomponenten enthält.

13. Raucherwaren-Filter nach Anspruch 12, bei dem die Stopfenumhüllung (23) ein Tabak enthaltendes Material, wie aufgeschlossene Tabakblätter, aufweist.

14. Raucherwaren-Filter nach Anspruch 12, bei dem die Stopfenumhüllung (23) ein Stopfenumhüllungspapier aufweist, auf dem Aromastoffkomponenten, vorzugsweise lösliche Tabakkomponenten, aufgebracht sind.

15. Raucherwaren-Filter nach Anspruch 1, 2 oder 3, welche einen Filterwirkungsgrad von etwa 61 % im unbelüfteten Zustand hat.

16. Raucherwaren-Filter nach einem der vorangebenden Ansprüche, welcher eine Belüftungsrate zwischen 65 % und 75 % hat.

17. Raucherwaren-Filter nach einem der vorangehenden Ansprüche, bei dem der Kern (21, 40) eine Querschnittsfläche hat, welche etwa 60 % der Gesamtquerschnittsfläche des Filters einnimmt.

18. Raucherwaren-Filter nach Anspruch 1, 2 oder 3, bei dem der Filter einen Zugwiderstand von etwa 146 mm Wassersäule hat, und der Mittelkern (21) einen Zugwiderstand von etwa 400 mm Wassersäule hat.

19. Raucherwaren-Filter nach Anspruch 1, 4 oder 5, bei dem der Filter einen Zugwiderstand von zwischen etwa 165 mm Wassersäule und etwa 195 mm Wassersäule hat, und der Mittelkern (40) einen Zugwiderstand von etwa 285 mm Wassersäule und etwa 385 mm Wassersäule hat.

20. Raucherwaren-Filter nach einem der Ansprüche 1 bis 17, welcher ferner einen zweiten Filterstopfen (53) aus einem Zelluloseacetatstrang angrenzend an den erstgenannten Filterstopfen (52) aufweist.

21. Raucherwaren-Filter nach Anspruch 26, bei dem das erste Filtermaterial das Bahnmaterial ist und das zweite Filtermaterial der Faserstrang ist, wobei der erste Filterstopfen (52) einen Zugwiderstand von zwischen etwa 85 mm Wassersäule und etwa 175 mm Wassersäule hat, der Mittelkern einen Zugwiderstand von zwischen etwa 250 mm Wassersäule und etwa 450 mm Wassersäule hat, und der zweite Filterstopfen (53) einen Zugwiderstand von zwischen etwa 15 mm Wassersäule und etwa 45 mm Wassersäule derart hat, daß der Filter einen Zugwiderstand von zwischen etwa 125 mm Wassersäule und etwa 175 mm Wassersäule hat.

22. Raucherwaren-Filter nach einem der Ansprüche 1 bis 19, welcher ferner ein Mundstückteil (14) aufweist, welches um denselben gewickelt ist, wobei das Mundstückteil sich über ein Ende des Filterstopfens (62) hinaus zur Anbringung des Filters an einer Zigarette und über das gegenüberliegende Ende des Filterstopfens hinaus zur Bildung der mundstückseitigen Ausnehmung in dem Filter erstreckt.

23. Raucherwaren-Filter nach einem der Ansprüche 1 bis 18, bei dem die Umfangschicht (20) einen niedrigeren Zugwiderstand als der Mittelkern (21) hat.

Revendications

1. Filtre à fumée comprenant un tampon de filtre (12, 31, 52, 62) ayant une âme centrale (21, 40, 54, 64) d'une première matière de filtration, et une couche périphérique (20, 41, 55, 65) d'une seconde matière de filtration, entourant l'âme centrale, l'une des première et seconde matières étant une filasse fibreuse et l'autre des première et seconde matières de filtration étant une matière en feuilles ondulées resserrées, caractérisé en ce que le filtre a une résistance à l'aspiration comprise entre environ 130 et environ 195 mm de colonne d'eau, l'âme centrale (21, 40) ayant une résistance à l'aspiration comprise entre environ 285 et environ 450 mm de colonne d'eau.

2. Filtre selon la revendication 1, dans lequel la première matière de filtration (21) est la matière en feuilles et la seconde matière de filtration (20) est la filasse fibreuse.

3. Filtre selon la revendication 2, dans lequel la seconde matière est une filasse d'acétate de cellulose ayant un denier par filament d'environ 8,0 et un denier total compris entre 25 000 et 30 000 et de préférence d'environ 30 000.

4. Filtre selon la revendication 1, dans lequel la première matière de filtration (40) est la filasse fibreuse et la seconde matière de filtration (41) est la matière en feuilles.

5. Filtre selon la revendication 4, dans lequel la première matière fibreuse est une filasse d'acétate de cellulose ayant un denier par filament d'environ 1,6 et un denier total d'environ 35 000.

6. Filtre selon l'une des revendications 1 à 5, dans lequel la matière en feuilles est le papier.

7. Filtre selon la revendication 6, dans lequel le papier est crêpé avant d'être ondulé et resserré.

8. Filtre selon l'une des revendications 1 à 5, dans lequel la matière en feuilles est formée d'une feuille non tissée.

9. Filtre selon la revendication 8, dans lequel la feuille non tissée est une feuille d'acétate de cellulose.

10. Filtre selon l'une des revendications 1 à 9, dans lequel la matière en feuilles ondulées et resserrées est entourée d'une enveloppe (23, 42) de tampon.

11. Filtre selon la revendication 10, dans lequel l'enveloppe (23) de tampon est poreuse.

12. Filtre selon les revendications 10 et 11, dans lequel l'enveloppe (23) de tampon contient des ingrédients qui parfument.

13. Filtre selon la revendication 12, dans lequel l'enveloppe (23) de tampon contient un matériau contenant du tabac, tel qu'une feuille de tabac reconstituée.

14. Filtre selon la revendication 12, dans lequel l'enveloppe (23) de tampon comprend du papier d'enveloppe de tampon auquel des ingrédients qui parfument ont été ajoutés, de préférence des éléments constituants solubles du tabac.

15. Filtre selon la revendication 1, 2 ou 3, ayant un rendement de filtration d'environ 61 % en l'absence de ventilation.

16. Filtre selon l'une quelconque des revendications précédentes, ayant un taux de ventilation compris entre 65 et 75 %.

17. Filtre selon l'une quelconque des revendications précédentes, dans lequel l'âme (21, 40) a une aire en section occupant environ 60 % de l'aire totale en section du filtre.

18. Filtre selon la revendication 1, 2 ou 3, dans lequel le filtre a une résistance à l'aspiration d'environ 146 mm de colonne d'eau, l'âme centrale (21) ayant une résistance à l'aspiration d'environ 400 mm de colonne d'eau.

19. Filtre selon la revendication 1, 4 ou 5, dans lequel le filtre a une résistance à l'aspiration comprise entre environ 165 et 195 mm de colonne d'eau, l'âme centrale (40) ayant une résistance à l'aspiration comprise entre environ 285 et 385 mm de colonne d'eau.

20. Filtre selon l'une quelconque des revendications 1 à 17, comprenant en outre un second tampon (53) de filtration d'une filasse d'acétate de cellulose, adjacent au premier tampon (52) de filtration.

21. Filtre selon la revendication 6, dans lequel la première matière de filtration est une matière en feuilles et la seconde matière de filtration est une filasse fibreuse, le premier tampon (52) de filtration a une résistance à l'aspiration comprise entre environ 85 et environ 175 mm de colonne d'eau, l'âme centrale a une résistance à l'aspiration comprise entre environ 250 et environ 450 mm de colonne d'eau, et le second tampon (53) de filtration a une résistance à l'aspiration comprise entre environ 15 et environ 45 mm de colonne d'eau, si bien que le filtre a une résistance à l'aspiration comprise entre environ 125 et environ 175 mm de colonne d'eau.

22. Filtre selon l'une des revendications 1 à 19, comprenant en outre une enveloppe de bout (14) qui l'entoure, cette enveloppe de bout dépassant d'une extrémité du tampon (62) de filtration afin que le filtre soit fixé à une cigarette et dépassant de l'extrémité opposée du tampon de filtration en formant une cavité dans le filtre à l'extrémité tournée vers la bouche.

23. Filtre selon l'une des revendications 1 à 18, dans lequel la couche périphérique (20) a une résistance à l'aspiration inférieure à celle de l'âme centrale (21).

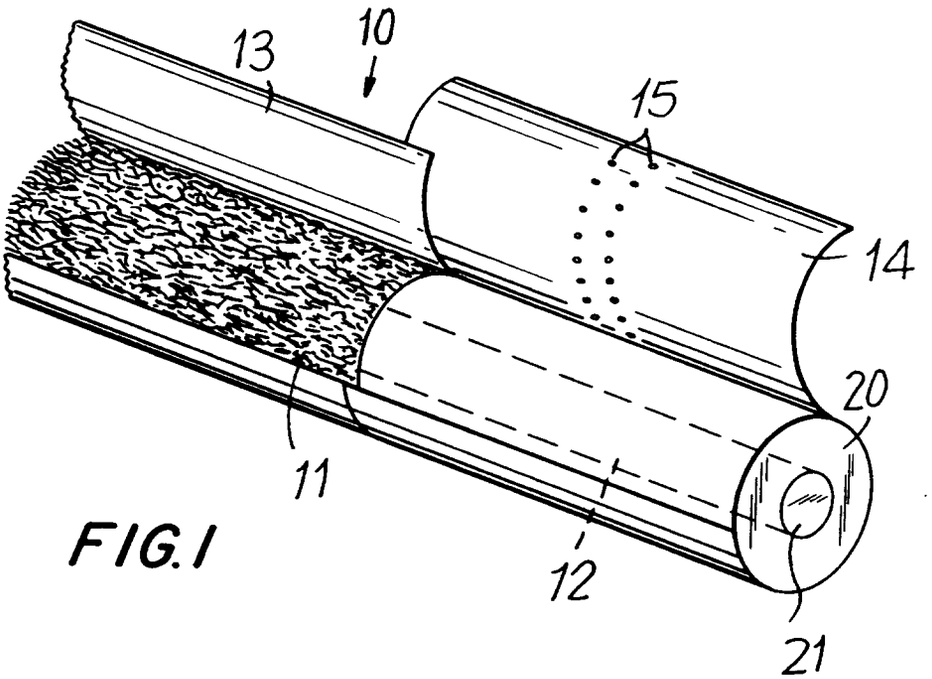


FIG.1

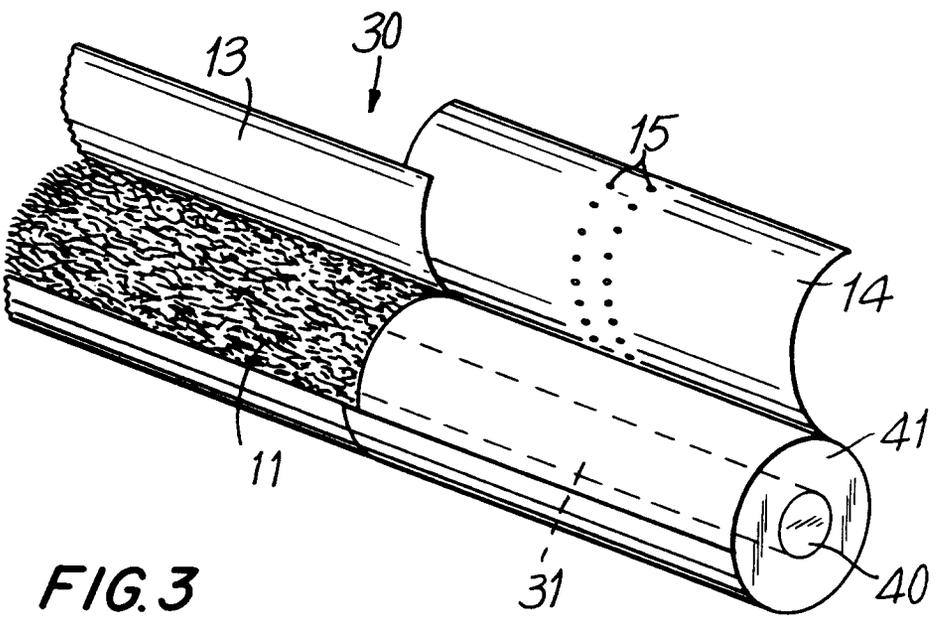


FIG.3

FIG. 2

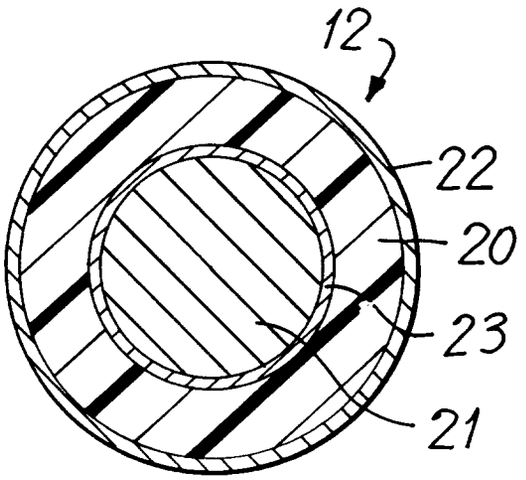
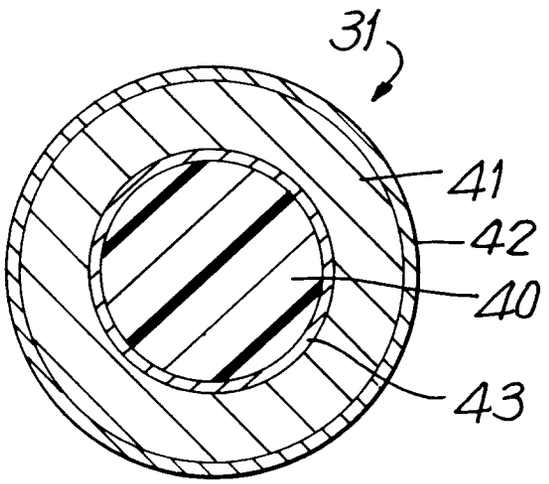


FIG. 4



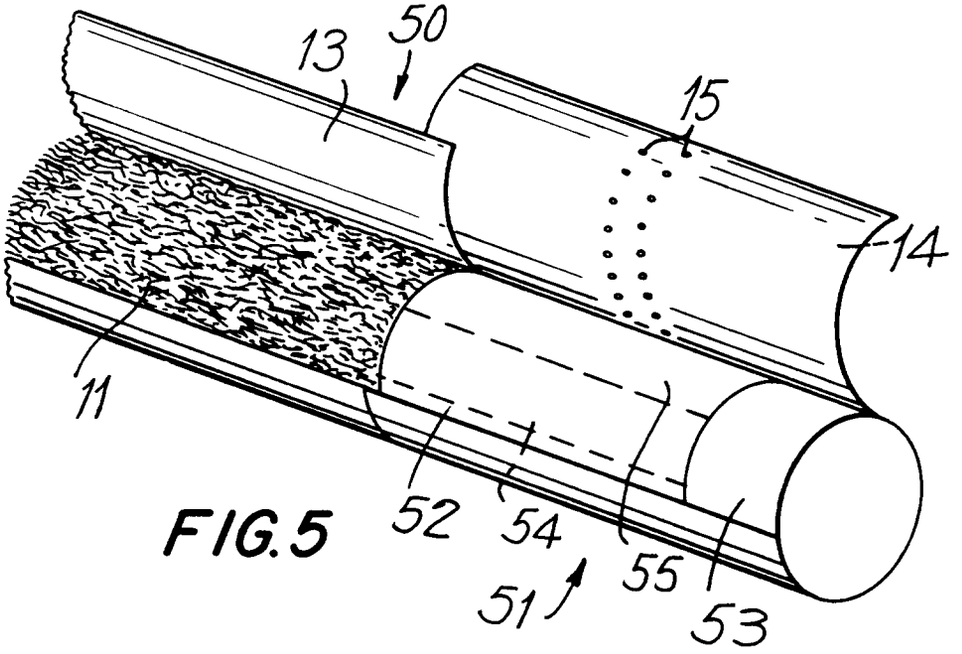


FIG.5

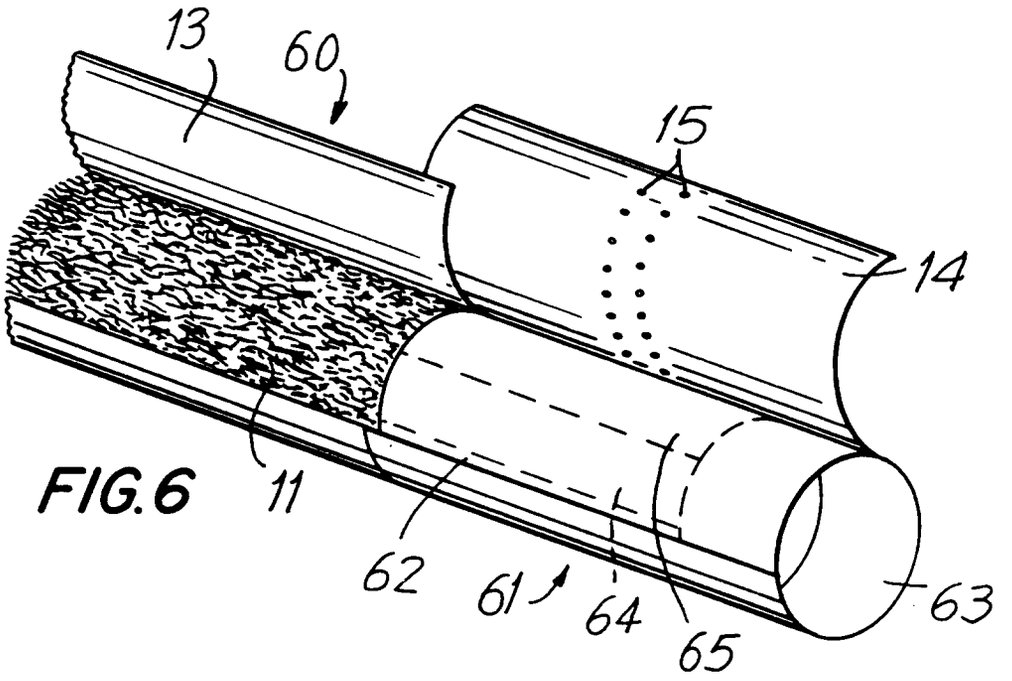


FIG.6