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(54) **Filters for cigarettes**

(57) A filter for a cigarette includes a smoke impermeable core 16 of generally cylindrical shape and a smoke permeable material 18, 28 overlaying at least a portion of the periphery of the core 16. The core with the overlaying permeable material is circumscribed by an air pervious tipping material 14 to form a cigarette filter 10.

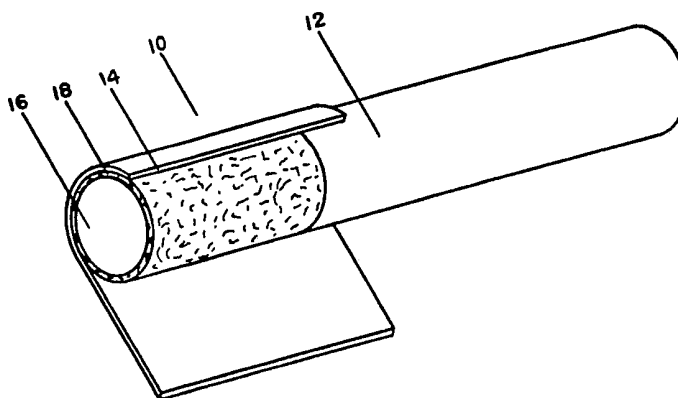


FIG. 1

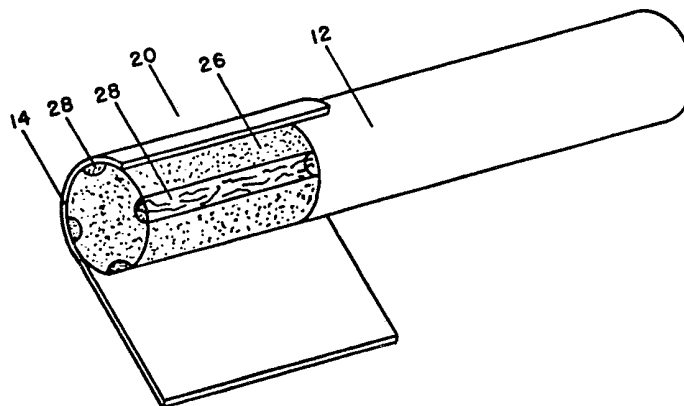


FIG. 2

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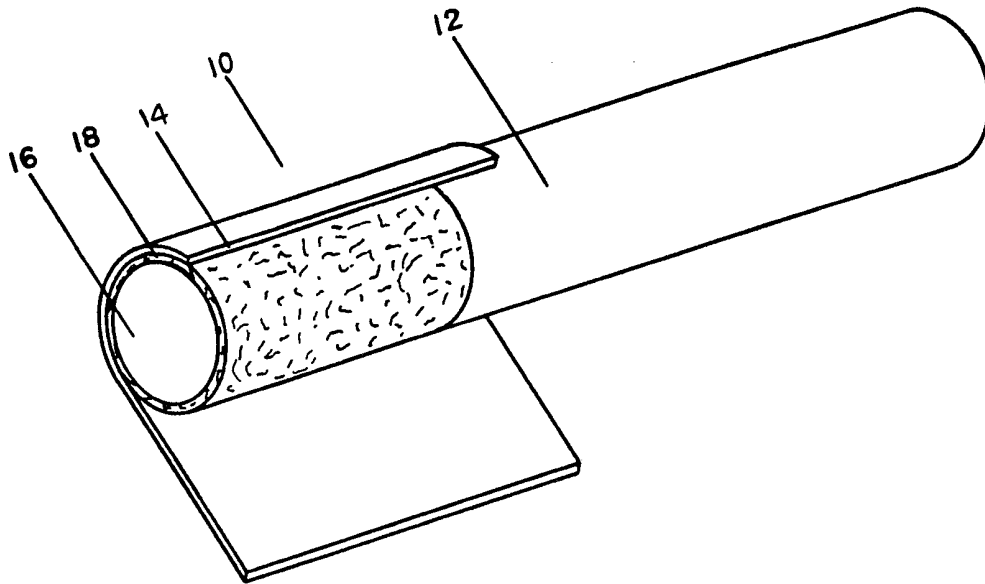


FIG. 1

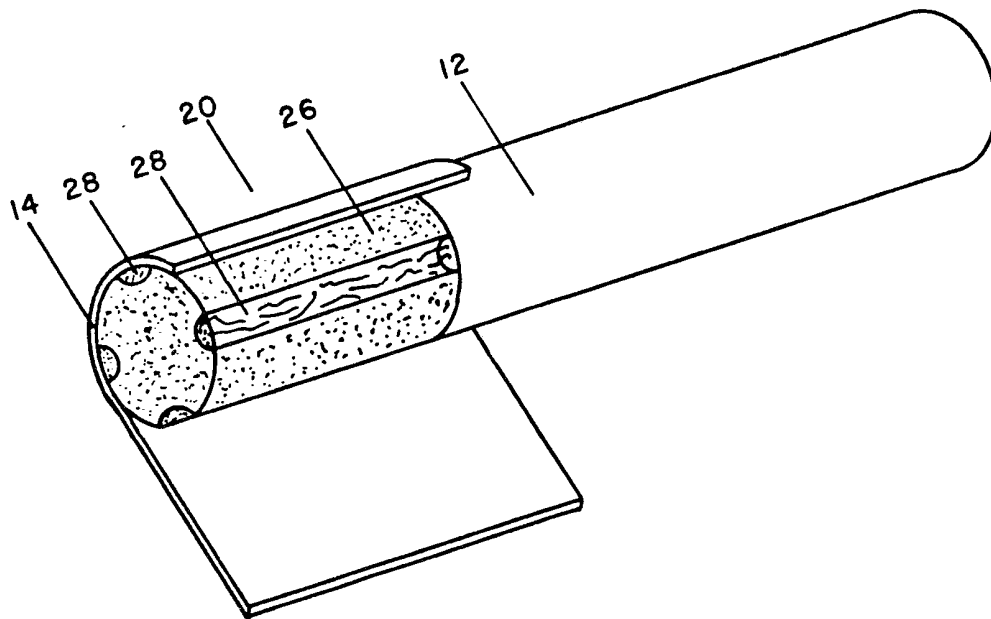


FIG. 2

SPECIFICATION

Cigarette filter

5 This invention relates to filters for cigarettes and like smoking articles. In one respect, it relates to a low efficiency filter having a reduced flow path for ventilating air and smoke providing an increased pressure drop to increase the draw resistance of the filter. In another respect, the present invention relates to a filter which functions to direct the flow of smoke exiting the filter from the periphery at the mouth end of the filter.

15 It is well known in the art of filter cigarettes to provide filters with ventilation means to allow ambient air to dilute the smoke traveling through the filter. The dilution of the smoke reduces the quantity of smoke particulate as well as the gas phase components which enter the smoker's mouth. For example, the outer wrapper surrounding the tobacco column can be made of a porous material which allows ventilating air to be introduced into the tobacco column along the entire length of the cigarette wherein it mixes with the smoke stream to dilute it before entering the smoker's mouth. Alternatively, the cigarette wrapper may be perforated at selected locations along the length of the cigarette to provide ports through which ventilating air enters the cigarette. It is also known to perforate the wrapper of the filter at the filter end of the cigarette to allow ventilating air to enter the filter and dilute the smoke stream flowing through the filter. Additional suggestions have included forming grooves within the filter plug of a cigarette to facilitate the addition of ventilating air into the smoke stream. Specific examples are shown in U.S. Patent No. 3,596,663; U.S. Patent No. 3,577,995; U.S. Patent No. 3,572,347; U.S. Patent No. 3,490,461; U.S. Patent No. 1,718,122; U.S. Patent No. 3,788,330; U.S. Patent No. 3,773,053; U.S. Patent No. 3,752,165; U.S. Patent No. 3,638,661; U.S. Patent No. 3,608,561; and U.S. Patent No. 3,910,288.

Further, in most commercially available cigarettes, either of the ventilated or non-ventilated type, the smoke is concentrated at the center of the mouth end of the filter as it exits the filter into the smoker's mouth thereby missing many of the "taste buds".

Therefore, these cigarettes, particularly of the highly ventilated type, deliver very little taste.

It is also true in many ventilated filter cigarettes that the draw effect is substantially less than that of more conventional cigarettes, which diminishes the smoking pleasure.

The present invention seeks advantageously to provide a straight-forward arrangement of a low efficiency cigarette filter which achieves a pressure drop producing a draw effort of a more conventional or normal cigarette. The

present invention further seeks to provide a ventilated filter for a cigarette for lowering tar predominantly by ventilation. The present invention even further seeks to provide a cigarette filter for dispensing the flow of smoke exiting the mouth end of the filter peripherally of the mouth end of the filter instead of centrally of the filter to enhance the flavour to the smoker.

According to the present invention there is provided a filter for a cigarette comprising: a substantially smoke impermeable core member of substantially cylindrical configuration;

a smoke permeable sleeve circumscribing the periphery of said cylindrical member; and, tipping material extending longitudinally of and circumscribing said wrapper, said tipping material being pervious to air over at least a portion of its surface.

A further advantageous aspect of the present invention provides a filter for a cigarette comprising a substantially smoke impermeable core member of generally cylindrical configuration, smoke permeable material overlaying selected portions of the periphery of said smoke impermeable core member; and tipping material extending longitudinally of and circumscribing the smoke impermeable core and the smoke permeable material, the tipping material being pervious to air over at least a portion of the smoke permeable material.

Embodiments of the present invention will now be described by way of example with reference to the accompanying drawings wherein like numerals refer to like parts throughout and in which:

Figure 1 is a perspective view of a cigarette filter attached to a tobacco column with the tipping material shown in a partially unwrapped position; and,

Figure 2 is a perspective view of a further cigarette filter construction attached to a tobacco column with the tipping material shown in a partially unwrapped position to more clearly show the details of construction.

Figure 1 illustrates a filter 10 attached to a tobacco column 12 by a tipping paper or material 14. The filter 10 comprises a substantially smoke impermeable core member 16 of substantially cylindrical configuration fabricated of, for example, a closed cell foamed material such as, a foamed cellulose acetate or polyurethane. A sleeve of smoke permeable member 18 circumscribes the periphery of the core member 16. The sleeve 18 is fabricated of a smoke filtering material and can be advantageously formed of, for example, a cellulose acetate fibrous material or an open-cell foamed cellulose acetate. It is contemplated that, from a manufacturing standpoint, a sleeve 18 fabricated of opened-cell foam would be desirable for the reason that the sleeve and cylindrical core member 16 could be manufactured in one operation

by co-extrusion. The tipping material 14 extends longitudinally of and circumscribes the sleeve 18. The tipping material 14 is pervious to ambient air so that, as a smoker draws on the cigarette, ambient ventilating air will be drawn through the tipping material into the interstice of the sleeve 18 to mix with the smoke flowing therein from the tobacco column 12 thereby diluting the smoke stream before it reaches the smoker's mouth. The tipping material 14 can be made pervious to the ambient air by virtually any method such as, for example, fabricating it of a non-porous substance and forming perforations there-through at preselected intervals, or as illustrated in Figure 1, the tipping material can be fabricated of a porous substance.

The smoke impermeable core member 16 and smoke permeable sleeve 18 can be sized, relative to each other, so as to produce different draw resistances. For example, with a filter 10 of a given diameter, for example 8mm, as the transverse cross-sectional area of the smoke impermeable core member 16 is increased, the cross-sectional flow-through area of the smoke permeable sleeve 18 will be decreased with a corresponding increase in filter draw resistance. The draw resistance of the filter 10 can also be changed by changing the density of the smoke permeable sleeve 18. The various components of the filter 10 are preferably sized and constructed to provide a pressure drop and, therefore, a draw resistance substantially the same as more conventionally constructed cigarette filters.

Another method contemplated for manufacturing the filter 10 is to inject the closed-cell foamed material forming the core member 16 into the area of the central axis of a smoke permeable filter rod. In this instance, the closed-cell foam material will constitute the smoke impermeable core member 16 and the portion of the smoke permeable filter rod surrounding the closed-cell foamed material will constitute the smoke permeable sleeve 18. A further contemplated method of manufacturing the filter 10 is to apply, by spraying or brushing, the closed-cell foamed material onto a tow or web of smoke permeable filter material, and folding or rolling the filter material around the closed cell foamed material to form the filter.

In Figure 2 there is illustrated a filter 20 attached to the tobacco column 12 by the tipping paper or material 14. The filter 20 comprises a substantially smoke impermeable core member 26 of substantially cylindrical configuration. The core member 26 can be fabricated of, for example, a closed-cell foamed cellulose acetate or polyurethane. Smoke permeable material in the form of strips 28 overlay selected portions of the periphery of the impermeable core 26. As shown, a plurality of smoke permeable strips 28 are embedded in the periphery of the

cylindrical core member 26. The smoke permeable strips 28 extend generally longitudinally of the core member 26 along its entire length, and are equally spaced from each other about the circumference of the core member 26. The smoke permeable strips 28 are fabricated of a smoke filtering material and can be advantageously formed of, for example, a cellulose acetate fibrous material or an open-cell foamed cellulose material. The air pervious tipping material 14 extends longitudinally of and circumscribes the core member 26 and embedded strips 28. As with the filter 10 of Figure 1, the draw resistance of the filter 20 of Figure 2 can be adjusted by increasing or decreasing the flowthrough cross-sectional areas of the strips 28, by changing the number of strips 28 and by fabricating the strips of material of greater or lesser density.

The smoke stream passing through the smoke permeable sleeve 18 in the embodiment of Figure 1 and through the smoke permeable strips 28 in the embodiment of Figure 2 is diluted with ventilating air before it exits the filter into the smoker's mouth. The diluted smoke stream exits the filter peripherally of the cigarette in proximity to the smoker's "taste buds", instead of in a concentration at the center of the mouth end of the filter, which enhances the perceived taste. Furthermore, when appropriately sized and constructed, the filter of the present invention provides a pressure drop which produces a draw resistance substantially the same as a more conventional cigarette.

The foregoing detailed description is given primarily for clearness of understanding and no unnecessary limitations are to be understood therefrom for modifications will become obvious to those skilled in the art upon reading this disclosure and may be made without departing from the scope of the invention as defined in the appended claims.

CLAIMS

1. A filter for a cigarette comprising:
a substantially smoke impermeable core member of substantially cylindrical configuration;
a smoke permeable sleeve circumscribing the periphery of said cylindrical member; and,
tipping material extending longitudinally of and circumscribing said wrapper, said tipping material being pervious to air over at least a portion of its surface.

2. The filter of claim 1, wherein said smoke impermeable substantially cylindrically shaped core member is fabricated of a closed-cell foamed material.

3. The filter of claim 1 or 2, wherein said sleeve is formed of an opened-cell foamed material.

4. The filter of claim 1 or 2, wherein said sleeve is fabricated of a fibrous material.

5. A filter for a cigarette comprising:
a substantially smoke impermeable core
member of generally cylindrical configuration;
smoke permeable material overlaying se-

5 lected portions of the periphery of said smoke
impermeable core member; and,
tipping material extending longitudinally of
and circumscribing said smoke impermeable
core and said smoke permeable material, said
10 tipping material being pervious to air over at
least a portion of said smoke permeable ma-
terial.

6. The filter of claim 5, wherein said smoke
permeable material overlaying selected por-
15 tions of the periphery of said impermeable
core member comprises strips extending
generally longitudinally of said core member.

7. The filter of claim 6, wherein said smoke
permeable strips are embedded in the peri-
20 phery of said smoke impermeable core.

8. The filter of claim 6 or 7, wherein said
strips are generally equally spaced apart from
one another about the perimeter of said core.

9. The filter as claimed in any one of claims
25 5 to 8 wherein said core is fabricated of a
closed-cell foamed material.

10. The filter as claimed in any one of
claims 5 to 8 wherein said permeable material
is an open-cell foamed material.

30 11. A method of making a filter for a
cigarette comprising the steps of:
extruding a generally cylindrically shaped
core member of substantially smoke imperme-
able material; and,

35 coextruding a sleeve of substantially smoke
permeable material coextensive with and sur-
rounding the core member.

12. A method of making a filter rod for a
cigarette comprising the steps of:
40 forming a generally cylindrically shaped
core member of substantially smoke permea-
ble material; and,
injecting a smoke impermeable material into
the area of the central axis of the core mem-
45 ber leaving an area surrounding the central
axis of the core member substantially free of
impermeable material.

13. The method of claim 12, wherein the
smoke impermeable material is a formable
50 material and foams insitu.

14. A method of making a filter rod for a
cigarette comprising the steps of:
forming a web of substantially smoke per-
meable material;
55 applying a substantially smoke impermeable
material to one surface of the web; and,
folding the web around the smoke imper-
meable material.

15. The method of claim 14, wherein:
60 the smoke impermeable material is a foama-
ble material and foams insitu.

16. A method of making a filter rod for a
smoking article substantially as described
herein with reference to and as illustrated in
65 the accompanying drawings.

17. A filter for a smoking article, substan-
tially as described herein with reference to
and as illustrated in Figure 1 or 2 of the
accompanying drawings.

70 18. A smoking article including a filter as
claimed in any one of claims 1 to 10 or 17 of
the accompanying drawings.

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