

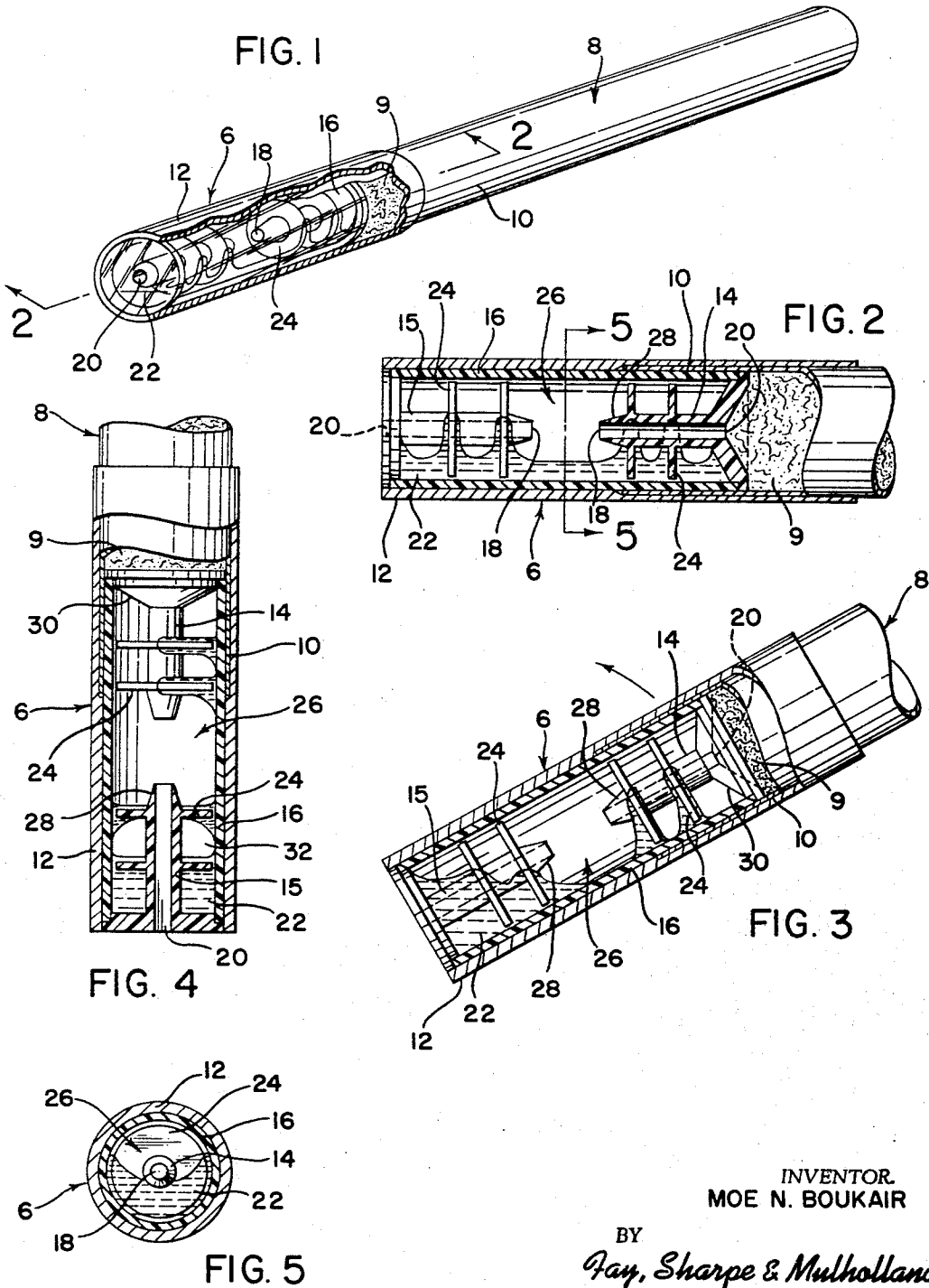
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LIQUID-CONTAINING FILTER

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LIQUID-CONTAINING FILTER
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4 Claims

ABSTRACT OF THE DISCLOSURE

A liquid-containing filter for tobacco burning articles having a smoke purifying cavity defined by a cartridge. The cavity is partially filled with a smoke absorbent liquid. The cartridge has tubular inlet and outlet means which direct smoke from the burning tobacco, into the cavity for purification, and then into the smoker's mouth. Each of the tubular members has discs extending from its outer surface to increase the surface area upon which smoke may be absorbed.

This invention concerns a liquid-containing filter for tobacco burning articles such as cigarettes, cigars and pipes. This filter will be shown and described in this application in conjunction with its use on a cigarette. It is however understood that my invention may also be used on a cigar or as an insert in the stem of a tobacco burning pipe.

More specifically this invention involves a liquid-containing cigarette filter comprising a cartridge defining a cavity in which a smoke-absorbent liquid is contained. Hollow tubular members are disposed in the cartridge whereby smoke is passed from the cigarette through one tubular member, into the cavity, purified and cooled by the liquid therein, and then expelled through another tubular member to the smoker's mouth.

The advantages of the instant invention lie in the fact that the liquid in the cartridge has the ability to purify and cool cigarette smoke as it passes through the filter and before it reaches the smoker's mouth. Further, it is not necessary that either tubular member be submerged in the liquid.

The prior art devices have attempted to solve the problem by the use of a cigarette holder in which water or a similar solution is contained. With these devices it is necessary to place the cigarette to be smoked in the holder before smoking and remove it after smoking. In addition it is necessary to periodically change the old contaminated liquid solution and replenish this with fresh solution. Often this change must be made after every pack of (i.e., 20) cigarettes.

In all of the prior art devices it is also necessary that there be a tubular member in the proximity of the smoker's mouth and another tubular member submerged in water or a like solution having smoke-absorbing qualities. Because of this fact it is possible to utilize the prior art devices by holding the cigarette holder in one position only, i.e., that in which the submerged member remains covered by liquid. Therefore, in prior devices, if the cigarette holder were inverted, the tubular member through which smoke is drawn to the smoker's mouth would be submerged in the water with the consequence of the smoker inhaling water or other solution used to purify the smoke.

It is an object of this invention to provide a cigarette filter which may be used in any position without danger of the intake tubular member being submerged and the resultant inhaling of water by the smoker.

It is a further object of this invention to take advantage of the usual manner in which a cigarette is smoked. Any movement of the smoker's hand and the cigarette, for

example, from mouth to ashtray, will mix the purifying and cooling liquid and thereby provide a new surface upon which the next passage of smoke may be exposed and absorbed.

These objects, as well as others relating to details of construction, will become apparent from the following description, read in conjunction with the accompanying drawings, in which:

FIG. 1 is a perspective view, partially cut-away, of the instant invention.

FIG. 2 is a longitudinal section of the instant invention along line 2-2 of FIG. 1.

FIG. 3 is a longitudinal section along line 2-2 of FIG. 1, showing the cigarette filter at an angle.

FIG. 4 is a side elevational view, partially cut-away of the cigarette filter of FIGS. 1, 2 and 3.

FIG. 5 is a cross-sectional view of FIG. 2 along line 5-5.

Referring now to the drawings, FIG. 1 shows a cigarette 8 containing tobacco 9 to which is attached filter 6 which embodies the instant invention.

FIG. 2 shows a longitudinal section of filter 6 of FIG. 1 taken along line 2-2. Filter 6 is comprised of a cartridge 16 having a cavity 26. A paper covering 10 wraps the cigarette tobacco 9 and overlaps cartridge 16 of filter 6. Paper covering 12 surrounds filter 6 and overlaps paper 10 thereby sealing the filter 6 to cigarette 8.

Disposed at opposite ends of cartridge 16 and extending inwardly in cavity 26 are hollow tubular members 14 and 15. Tubular member 14 is adjacent the cigarette 8 and tobacco 9; tubular member 15 is adjacent the smoker's mouth while he is smoking the cigarette.

Both tubular members 14 and 15 have inner apertures 18 and outer apertures 20. Inner apertures 18 are of capillary side to prevent liquid 22 from entering same. Outer aperture 20 of tubular member 14 permits smoke to pass into the filter. Outer aperture 20 of tubular member 15 permits passage of smoke into the smoker's mouth. Tubular members 14 and 15 have a frusto-conical shape at their inner ends. These are shown in the drawings as surfaces 28. These surfaces 28 help prevent liquid 22 from entering inner apertures 18 by directing any liquid contacting them away from apertures 18. Increased surface area for liquid 22 may also be obtained by providing tubular member 14 and/or 15 with a bevelled or frusto-conical surface 30 at its point of attachment to the end of cartridge 16. As shown, this frusto-conical surface 30 is the surface nearest the burning tobacco and diverges away from the remainder of the cartridge.

Discs 24 surround and are attached to tubular members 14 and 15. It is understood that discs 24 are not entirely necessary for acceptable operation of the instant invention. However they are believed desirable as they prevent sloshing or splashing of the liquid 22 into inner apertures 18. In addition they form surfaces upon which liquid 22 will cling, thereby increasing the amount of liquid surface area to which the smoke is exposed. Further it has been found that use of discs 24 enables a greater quantity of liquid 22 the filter to be available for smoke treating because of the clinging of the liquid 22 to the discs and diversion of liquid 22 away from inner apertures 18. It should also be noted that discs 24 may be replaced by flanges or the like which would not completely surround the tubular members as do discs 24.

FIG. 2 also illustrates the manner in which the liquid 22 will cling to discs 24 when the cigarette is held in a horizontal position.

FIGS. 3 and 4 illustrate the levels sought by liquid 22 when held in a tipped (FIG. 3) or vertical (FIG. 4) position. FIG. 3 illustrates how the frusto-conical surfaces 28 of tubular member 15 diverts liquid 22 away from inner aperture 18. Discs 24 on tubular member 14 also

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hold some of liquid 22, thereby preventing flow into inner aperture 18.

In FIG. 4 the liquid 22 level is illustrated as it would appear when the cigarette is in a standing position, as for example, when packed in a pack of cigarettes and standing in a vertical position. FIG. 4 shows a filter with less than 45% of the cavity 26 filled with liquid 22. It has been found that the liquid in the cavity should not exceed 45% of the capacity thereof. In such a position it is likely that an air pocket 32 may form between discs 24 and tubular member 15.

Thus it can be seen by viewing FIGS. 2, 3 and 4 that regardless of the position in which cigarette filter 6 is placed the liquid 22 will never cover or flow into inner apertures 18 of either tubular members 14 or 15.

FIG. 5 illustrates the tendency of liquid 22 to cling to the walls of cartridge 16 and thereby avoid flow into inner apertures 18 of tubular members 14 or 15.

It has been found that the most practical, inexpensive and efficient liquid to be placed in cavity 26 is water. However, other liquids having smoke-absorbent and/or cooling qualities may be used.

In operation my invention functions as follows: The smoker draws or inhales at outer aperture 20 of tubular member 15. This causes smoke to pass from cigarette 8 into outer aperture 20 of tubular member 14, through tubular member 14, out inner aperture 18 of said tubular member and into cavity 26. The smoke is then absorbed by liquid 22. It should be noted that discs 24 and liquid 22 clinging thereto provide a large surface area for absorption. Liquid 22 absorbs tars, nicotine, and similar impurities of the smoke causing them to be removed from the smoke and deposited in the water. Efficient cooling of the smoke is also effected by liquid 22. The smoke then passes through inner aperture 18 of tubular member 15, through said tubular member, and out its outer aperture 20 into the smoker's mouth.

I claim:

1. A liquid-containing filter for a tobacco burning article comprising:

- an elongated cartridge adapted to be attached to the article;
- said cartridge defining a cavity;
- said cartridge containing a smoke-absorbent liquid;
- said cartridge having hollow tubular members extending lengthwise therewithin;
- said tubular members being disposed at opposite ends of said cartridge and attached thereto;

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one of said tubular members having inlet means allowing smoke to enter said cavity;

the other of said tubular members having outlet means allowing smoke to leave said cavity;

said inlet and outlet means being composed of inner and outer apertures in the ends of said tubular members and the ends of said cartridge;

said inner apertures being capillary in size to prevent said liquid from entering said inner apertures; the inner aperture being disposed above the level of the liquid when the cartridge is horizontally disposed; a flange extending radially beyond each tube into the liquid whereby the surface tension of said liquid causes adherence to said flanges and increase of the liquid surface area.

2. The liquid-containing filter of claim 1 wherein: said cartridge is filled with said liquid to not more than 45% capacity.

3. The liquid-containing filter of claim 1 wherein: said flanges extending from said tubular members are composed of first and second discs, said discs being complementary in shape to the inside shape of said cartridge,

said first disc being spaced from the free end of said tubular member,

said second disc being disposed intermediate said first disc and the said ends of said cartridge.

4. The filter of claim 1 wherein the surface of the interior of the cartridge at the end of the filter adapted to be placed nearer the burning tobacco is conical and diverges away from the remainder of the cartridge.

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