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T. F. HUG

2,867,219

CIGARETTE FILTER

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FIG. 1

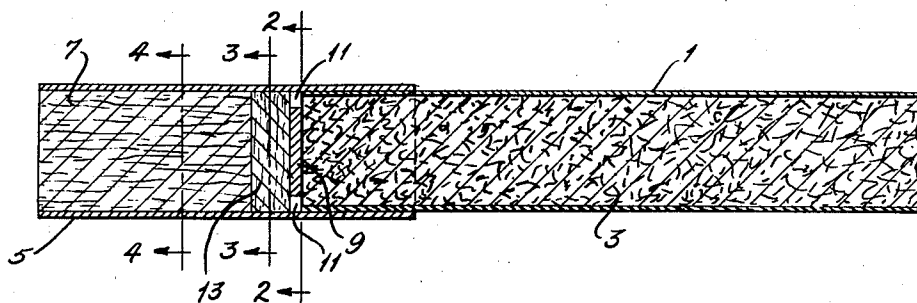


FIG. 2

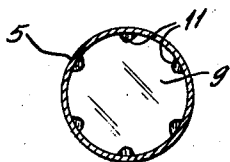


FIG. 3

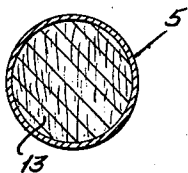
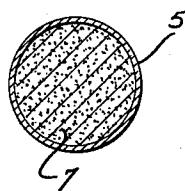


FIG. 4



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CIGARETTE FILTER

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4 Claims. (Cl. 131-10)

This invention relates to cigarette filters, and more particularly to filters having an improved cooling action.

It will be understood that some authorities consider the heat of cigarette smoke to be harmful, and others are concerned with inhaled tar vapors. Although a conventional filter is effective in trapping solid matter and liquid droplets, there is room for improving other characteristics of a filter. Accordingly, one of the primary objects of the invention is to provide a filter having improved cooling and condensing action. Briefly, this disclosure contemplates a filter formed as a multi-piece device including a scalloped but otherwise impervious disc and an anterior mass of filtering material. Preferably, the filtering material includes a fibrous front collector with its fibers running crosswise of the cigarette followed by a somewhat longer section of fibrous material with the fibers running longitudinally.

The smoke is directed by the scallops at the edge of the disc so as to pass adjacent the enclosing wrapper of the filter where the cooling effect is at a maximum. It may also be noted that the notches in the scalloped disc serve to condense or compact the smoke, so that apart from the cooling effect, there is a greater tendency for the impurities to be intercepted and picked up by the filtering material behind the disc. In other words, I have found that the fibrous filtering material is more efficient when the entering smoke is distributed through rather small openings as compared with a wide opening, as would be the case in the absence of the scalloped disc. Ideally, the notches or scallops should be as small as possible, without clogging. As a result, a considerable amount of the tar is condensed out and is picked up by a collector immediately behind the disc. Moreover, the tobacco tars tend to accumulate in the center portion of the filter so as not to interfere with the draw.

Other features of the invention will be in part apparent from and in part pointed out in the following detailed description taken in connection with the accompanying drawings, in which:

Fig. 1 is a longitudinal section illustrating a cigarette and filter embodying the invention;

Fig. 2 is a cross section taken on the line 2-2 of Fig. 1;

Fig. 3 is a cross section taken on the line 3-3 of Fig. 1; and

Fig. 4 is a cross section taken on the line 4-4 of Fig. 1.

Before considering the detailed structure of the filter, it may be helpful to look at the cigarette itself. The smoke from the burning tobacco is initially hot and contains solid matter, moisture and tar vapors. As the smoke is drawn rearwardly through the unburned tobacco, some filtering occurs and the smoke has an opportunity to cool.

On the other hand, this inherent filtering and cooling action necessarily depends upon the length of the un-

burned portion, hence deteriorates rapidly. A simple filter has the effect of lengthening the path of the smoke, thereby affording further opportunity for filtering and cooling, especially during the later stages of a smoke. Filtering action is also improved to the extent that the fibrous material of the filter is fine and closely spaced, thereby being a more effective trap, but the distribution of the smoke in the filter may not be uniform, a factor that becomes aggravated as tars accumulate.

The problem of uniform distribution has involved the introduction of longitudinal guide tubes, such as rolled corrugated paper and the cooling problem has been handled by lengthening the path of the smoke. The present invention is directed to a different arrangement whereby cooling action and smoke distribution are controlled simultaneously.

Referring now to the drawings, there is shown a cigarette comprising the usual paper wrapper 1 and filling of tobacco 3. The filter comprises an outer tube-like mouthpiece or tip 5 secured to the back of the wrapper of cigarette paper 1. The anterior portion of tip 5 is filled with a mass of filtering material 7, and as such, the filter is similar to conventional types.

The invention more specifically lies in the provision of a disc 9 of relatively impervious material disposed immediately behind the tobacco 3 at the forward end of the filter. This disc may be formed of paper with a diameter corresponding to the inside dimensions of the mouthpiece, but it is scalloped so as to provide a plurality of notches 11 spaced about its margin. The scalloped disc thereby causes all of the smoke to be guided outwardly against the tip or wrapper 5 before entering the main portion of the filter.

There are several reasons for this arrangement. In being directed outwardly, the smoke necessarily comes in contact with the wrapper, so that the cooling action is at a maximum. As the smoke is cooled in its passage around the disc, a substantial portion of the tar tends to condense out in the center portion of the filter, and the smoke is broken into several discrete paths for improved distribution preparatory to its passage through the main portion of the filter.

Apart from the cooling effect, there is a second and perhaps more important action resulting from the scalloped disc. The disc necessarily reduces the cross section of the draft (as compared with a condition without a disc) so that the smoke is condensed or compacted as it enters the fibrous filtering material. When the smoke is confined in this manner, the fibrous material seems to have a better filtering action and a larger proportion of the impurities are picked up in the filter (as compared with a conventional filter which opens direct to the tobacco across the entire cross section of the cigarette).

The filter otherwise comprises a fibrous collector 13 located immediately behind the disc 9 and the fibrous section 7 filling the rest of the tip. The collector is a rather short piece and may be cut from a sheet of matted fibers. As such, the fibers of the collector extend crosswise to the axis of the cigarette, whereas the longer fiber section 7 preferably has its fibers extending longitudinally. In operation, a substantial portion of the condensed tar vapors accumulate in the collector well ahead of the center portion so as not to interfere with the draft or draw of a cigarette. The result is that there is less inhaled tar, more uniform draw throughout the smoke and reduced temperature with improved mildness and better flavor.

From the foregoing description, it is apparent that those skilled in the art will understand the structure, function and mode of operation of the invention herein disclosed, and appreciate the advantages thereof. Al-

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though one embodiment has been disclosed in detail, it is to be understood that the invention is not limited thereto, but the drawings and description thereof are to be understood as being merely illustrative. It is realized that many modifications and variations will present themselves to those skilled in the art without departing from the spirit of this invention or the scope thereof as set forth in the appended claims.

Having thus described the invention, what is claimed and desired to be secured by Letters Patent is:

1. In a cigarette filter having a tube-like mouthpiece extending rearwardly from a cigarette, the improvement comprising a disc of relatively impervious material located adjacent the front of the mouthpiece, said disc being formed with openings of uniform size uniformly disposed solely about its periphery so as to direct and concentrate flow of smoke adjacent the wall of the mouthpiece, and a mass of fibrous filtering material disposed behind said disc to intercept the smoke upon leaving the openings at the periphery of said disc.

2. In a cigarette filter having a tube-like mouthpiece extending rearwardly from a cigarette, the improvement comprising a disc of relatively impervious material located adjacent the front of the mouthpiece, said disc being formed with openings principally spaced about its periphery so as to direct and concentrate flow of smoke adjacent the wall of the mouthpiece, and a collector of fibrous material located immediately behind said disc to intercept the smoke upon leaving the open-

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ings of said disc, said collector having its fibers extending crosswise with respect to the axis of the cigarette.

3. A cigarette filter as set forth in claim 2, further including a section of fibrous material located in the mouthpiece behind said collector, said last section being of relatively greater length than the collector and having its fibers extending longitudinally with respect to the filter.

4. In a cigarette filter having a tube-like mouthpiece extending rearwardly from a cigarette, the improvement comprising a disc of relatively impervious material located adjacent the front of the mouthpiece, said disc being formed with a scalloped periphery to define a plurality of uniformly shaped openings spaced uniformly about its periphery so as to direct and concentrate flow of smoke adjacent the wall of the mouthpiece, and a mass of filtering material disposed behind said disc to intercept the smoke upon leaving the openings of said disc.

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