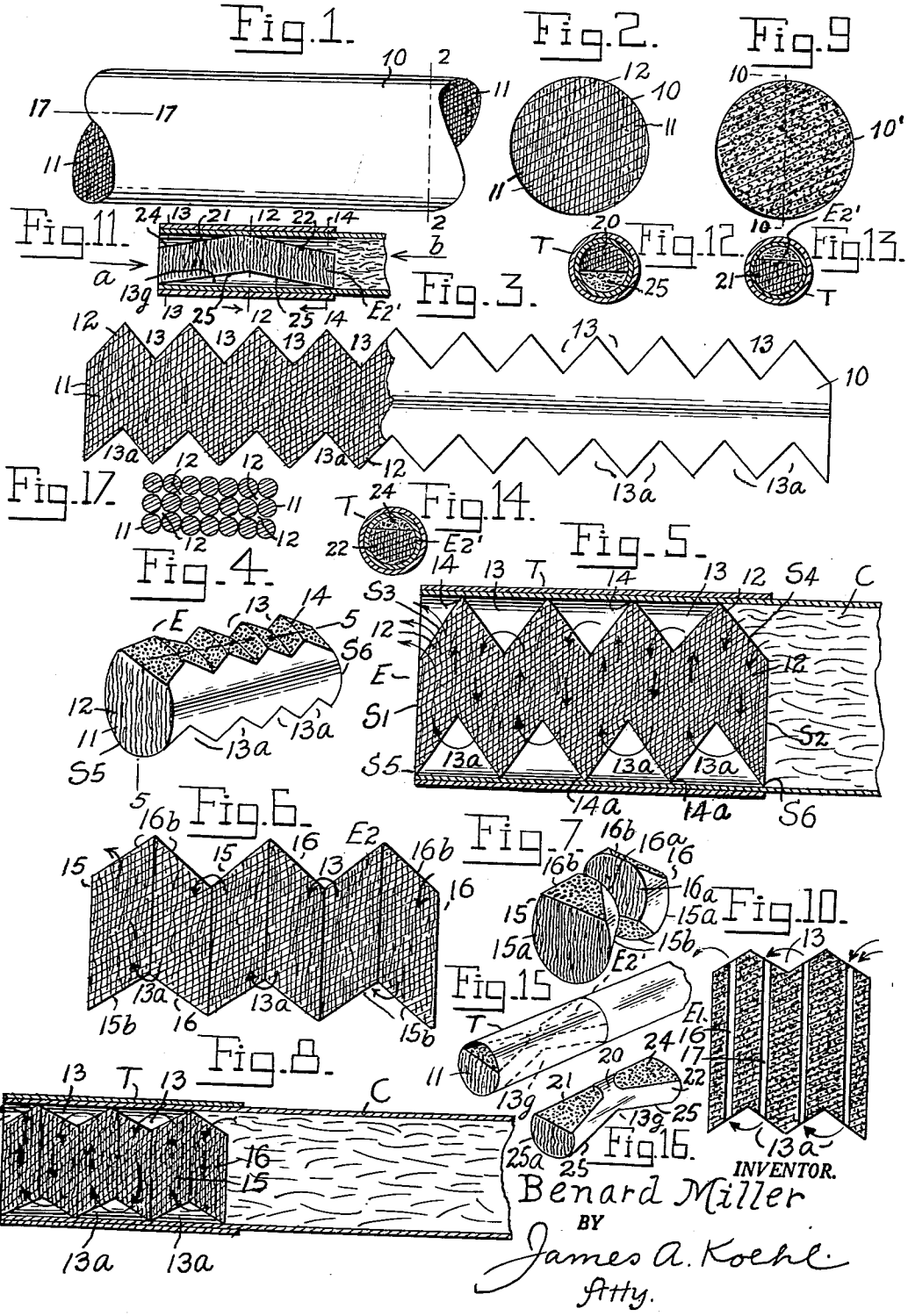
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CIGARETTE FILTER

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INVENTOR.

Benard Miller

BY

James A. Koehl

Atty.

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CIGARETTE FILTER

Benard Miller, 1665 Veteran Ave., West Los Angeles 25, Calif.

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This invention relates to filters for cigarettes and other smoker's articles and is a further development of the disclosure in my abandoned application Serial No. 19,765 filed April 4, 1960.

An object of the invention is the provision of a new and improved filter adapted to be contained in the tip of a cigarette for entrapment of tars and other deleterious matter during passage of smoke through the filter, insure free drawing of the cigarette and effectively cool the smoke.

Other objects and advantages will become apparent to persons skilled in the art from the following detailed description when taken with the accompanying drawings, in which:

FIGURE 1 is a view in elevation of the stock from which one embodiment of the invention is formed; FIGURE 2 is a section taken on line 2—2 of FIGURE 1; FIGURE 3 is a view partly in elevation and partly in section showing the stock formed to enable similar filter elements to be obtained therefrom; FIGURE 4 is a perspective view of one of the filter elements; FIGURE 5 is a section taken on line 5—5 of FIGURE 4 showing the filter contained in the tip of the cigarette; FIGURE 6 is a longitudinal section through a modified embodiment of the filter; FIGURE 7 is a perspective view of a pair of complementary disks of a plurality of similar pairs of disks from which the composite filter structure is formed as shown at FIGURE 6; FIGURE 8 is a view showing the filter (FIGURE 6) contained in the tip of the cigarette; FIGURE 9 is a transverse section through a modified form of filter stock; FIGURE 10 is a section taken on line 10—10 of FIGURE 9; FIGURE 11 is a section through a portion of a cigarette showing a still further embodiment of filter; FIGURES 12, 13 and 14 are transverse sections taken on lines 12—12; 13—13 and 14—14 respectively of FIGURE 11; FIGURE 15 is a perspective view of a portion of a cigarette showing in the tip thereof the filter disclosed at FIGURE 11; FIGURE 16 is a perspective view of the filter (FIGURE 15) removed from the tip, and FIGURE 17 is a section taken on line 17—17 of FIGURE 1.

In the accompanying drawing, like reference numerals and letters will designate like forms, shapes and structural features of the invention throughout the several figures.

Referring to FIGURES 1 and 2, 10 designates a long length of fibrous filter stock of circular cross section composed of any well known substance such as cellulose or equivalent inert water insoluble substance, preferably of vegetable origin capable of being compressed to a homogeneous mass in which the fibers 11 run sensibly in the same transverse direction through the stock to provide a multiplicity of intervening interstices 12 therebetween as shown greatly enlarged at FIGURE 17, the compactness of the mass being such as will retard if not prevent passage of smoke through the filter other than through the interstices 12 in a manner to be presently explained.

As shown at FIGURE 3, the stock 11 is formed at its opposite sides with longitudinal rows of transverse furrows 13 and 13*a*, the same providing junction points at which intercommunication is established between reversely extending interstices. At FIGURES 4 and 5, element E is a section detached from the stock 10 after the furrows have been formed, it being noted that the longitudinal row of transverse furrows 13 comprises three similar furrows, the row at the opposite side comprising four similar furrows 13*a*, the latter staggered in a longitudinal direction relative to said furrows 13. In practice, the approximate length of filter element E will be about one inch and the diameter about five sixteenths of an inch, and the furrows 13 and 13*a* may be of any desired number and depth. As illustrated at FIGURE 5, the arcuate crests 14 and 14*a* of the furrows are intimately surrounded by adjacent inner wall surfaces of the tip T of cigarette C. The element E is essentially characterized by a flat surface S1 disposed at right angles to the long axis of the bore of said tip at the mouth receiving end thereof and a similar surface S2 at the butt end of the cigarette, said surfaces merging onto angular surfaces S3 and S4 of the respective ends of said element such that and by virtue of the interstices 12 the point of ingress of smoke to the element is at said surface S4 and the point of egress at surface S3, said interstices opening onto said surfaces. When element E is contained in tip T of the cigarette all arcuate surfaces of the crests of furrows 13 and 13*a* and said surfaces S5 and S6 will be closely confined against the adjacent wall surfaces of the bore of said tip, thereby preventing passage of smoke along paths other than said interstices 12 as will be understood when observing the directions indicated by the arrows at FIGURE 5. From the surface S4 of element E the path of the smoke is transversely through the element where it enters furrow 13*a* at the butt end of the cigarette and then in an opposite direction where it enters the furrow 13 which is next adjacent to the butt end of the cigarette, and so on in zigzag fashion, finally arriving at surface S3 onto which the interstices open. The arc of the circle at each end of the element is sufficiently less than 360 degrees for free ingress of the smoke to and egress thereof from the filter.

The exemplified form of my invention shown at FIGURES 6, 7 and 8 comprises sensibly identical fibrous disks 15 and 16 of circular shape placed back to back, each disk having flat parallel sides 15*a* and 16*a* and relatively parallel acute angular surfaces 15*b* and 16*b*. When the disks are placed back to back as shown at FIGURE 6 and are suitably bonded to each other by any well known binder, the general appearance of the composite filter element E2 is substantially like element E shown at FIGURES 4 and 5 and will function in the same manner, the fibers of the disks extending in the same direction transversely of said element E2. At FIGURE 8, the filter is also contained in the tip of the cigarette in the same manner as set forth in the description of filter E.

The filter element E1 shown at FIGURE 10 is formed from the porous stock 10' shown at FIGURE 9 and may consist of a selected clay such as kaolin commercially known as "Whitetex" produced by Southern Clays, Inc., 33 Rector Street, New York 6, N.Y. Other well known filter substances such as charcoal, pellets of cellulose, etc. may be employed. Any of these substances can be made into a filter element of a density to retard passage of smoke therethrough except by way of the reversely extending intercommunicating passages 16 and 17, the general form and shape of element E1 being in most respects the same as element E disclosed at FIGURE 4.

The filter element E2' shown at FIGURES 11–16, inclusive consists of any one of the aforementioned filter substances. As shown, it is a fibrous mass in which the fibers extend transversely thereof in substantially the same manner as set forth in the description of the embodiment disclosed at FIGURE 4. The element E2' is elongated and formed with an intermediate substantially semi-circular portion 20 which is concentric with the bore of tip T, and front and rear end portions 21 and 22, each defined by a flared surface 24 and a flared surface 25, the latter disposed parallel to the former. By this unique

arrangement, the surfaces 25—25 of the respective end portions of the element provide a transversely disposed furrow 13*g*. When the element is contained in the tip as shown at FIGURE 15, the adjacent walls of the bore of the tip combine with the furrow to form a trap into which smoke will enter from the butt end of the cigarette and leave the trap and be drawn transversely through the element in a reverse direction and discharged from the mouth receiving end of the tip. Said portions 21 and 22 are slightly more than semi-circular as indicated at 25*a* and therefore concentric with the walls of the bore of tip T. The arcs describing the transverse curvatures of said portions may be about two hundred and seventy degrees of a circle. The arc describing the intermediate portion 20 of said element E2' may be something like one hundred and eighty degrees of a circle. In this regard, it is not intended that limitations shall be imposed. When the element is contained in the tip there is but one course the smoke can take in its passage through the element, namely, from the butt end of the cigarette and transversely through said element when it will enter the furrow 13*g* and then drawn in the reverse direction transversely of the element and to the mouth receiving end of the tip.

I place particular stress upon the form and shape of a filter element provided with passageways extending respectively in reverse directions transversely of an elongated body of any well known filter substance, said passage ways combining with at least one transversely disposed furrow to provide a trap and to establish intercommunication between said passageways.

What I claim is:

1. A cigarette filter for a cigarette having a tip defining a bore comprising a cylindrically shaped homogeneous mass of filter material, said filter being mounted within and substantially filling the bore of the tip of a cigarette, the filter material being compressed into a compact mass of a density to prevent travel of smoke through the filter in a direction parallel to the longitudinal axis thereof, a plurality of parallel passageways formed in the filter, said passageways extending transversely to the longitudinal axis of the filter, each end of said filter having a beveled surface, and at least one furrow formed in the periphery of the filter intermediate the ends thereof and diametrically opposite to at least one of the beveled surfaces, the open side of the furrow being in confronting relation to and closed by the wall of the cigarette tip bore, said furrow extending transversely of the passageways and establishing intercommunication between corresponding ends of said passageways, whereby smoke from the cigarette enters the filter in a direction through one series of passageways to the furrow wherein the direction of travel of the smoke is reversed, the smoke then traveling in an opposite direction through a second series of passageways and outwardly through the beveled surface at the mouth-receiving end of the tip.

2. A filter as set forth in claim 1, wherein the filter material consists of moisture-resistant fibers and the passageways comprise interstices between the fibers.

3. A filter as set forth in claim 1, wherein the furrow is defined by angularly related wall surfaces which intersect each other at substantially the medial portion of the filter and extend to the respective ends of said filter.

References Cited in the file of this patent

UNITED STATES PATENTS

1,996,990	Cullen	Apr. 9, 1935
2,763,267	Muller	Sept. 18, 1956
2,785,681	Fessler	Mar. 19, 1957
2,954,774	Lebert	Oct. 4, 1960
2,954,782	Lebert	Oct. 4, 1960

FOREIGN PATENTS

19,670	Great Britain	Sept. 9, 1902
20,690	Germany	Jan. 3, 1883
436,432	Great Britain	Oct. 10, 1935
663,858	France	Apr. 15, 1929