

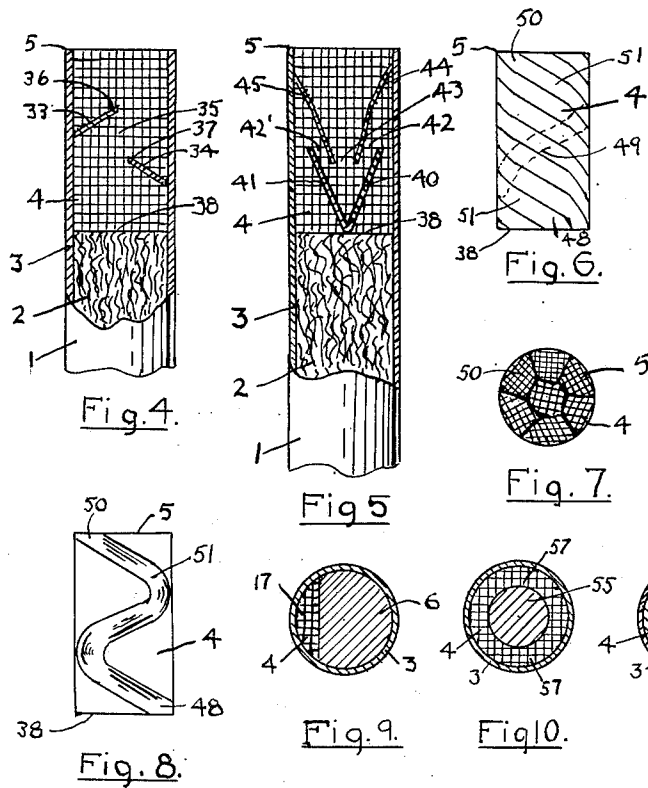
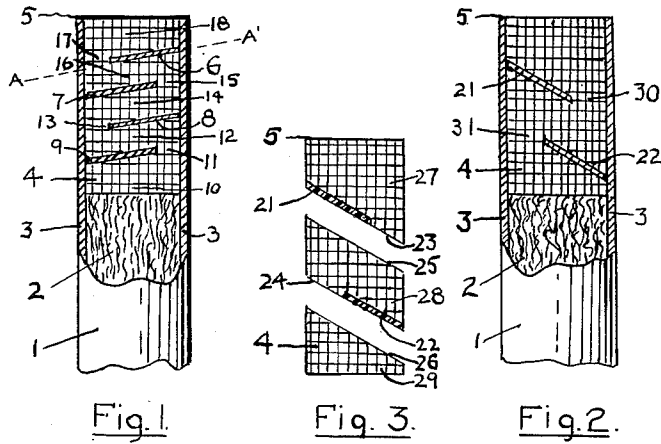
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CIGARETTE FILTERS

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1

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CIGARETTE FILTERS

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This invention relates to and has for its object the provision of improvements in filters that are used on smokable items such as cigarettes, cigars, pipes, and the like.

Its principal application is in the filter commonly contained in the so called "built-in filter cigarette."

It is generally agreed that filters are effective to a degree in removing from tobacco smoke some of the ingredients said to be harmful to the health of the smoker. But—the filter in the average cigarette is approximately one-half inch long and whatever filtering or partial purifying is to be done by means of it must take place while the tobacco smoke flows through this small area. Whatever cooling the filter imparts to the smoke is also limited to the small space of the filter.

It is an object of this invention to increase the amount of filtering without increasing the size of the filter.

Another object of this invention is to provide a filter that produces a greater degree of cooling for smoke passing through it than is now produced by a prior art filter occupying the same space.

This invention provides a filter that conducts the smoke for a much greater distance within itself than the outer filter dimensions would suggest.

Other objects, advantages, and features of the invention will become apparent from the following description read in conjunction with the accompanying drawings.

FIGURE 1 is a fragmentary enlarged longitudinal sectional view of a cigarette embodying this invention.

FIGURE 2 is also a fragmentary enlarged longitudinal sectional view of a cigarette showing another embodiment of the invention.

FIGURE 3 is a sectional view of a disassembled filter such as was used in FIGURE 2.

FIGURE 4 is a fragmentary enlarged longitudinal sectional view of a cigarette showing still another embodiment of the invention.

FIGURE 5 is a fragmentary enlarged longitudinal sectional view of a cigarette showing still another embodiment of the invention.

FIGURE 6 is a view of a filter in side elevation.

FIGURE 7 is a view of the end elevation of the filter illustrated in FIGURE 6.

FIGURE 8 is a side elevational view of the filter illustrated in FIGURE 6, with all but one filter strand removed.

FIGURE 9 is a sectional view taken substantially on a line A—A' of FIGURE 1.

FIGURE 10 is a sectional view of another embodiment of the invention.

FIGURE 11 is a sectional view of still another embodiment of the invention.

In the drawings, like characters of reference are employed to denote like parts throughout the several figures.

Referring specifically to the drawings, the numeral 1 designates a fragmentary portion of a cigarette. At 2 is the tobacco; at 3, the cigarette paper; at 4, the filter, and at 5, the mouth end of the filter.

Referring now to FIGURE 1. The paper walls 3 of the fragmentary portion of cigarette 1 form a tubular structure surrounding a space or bore referred to hereinafter as the lumen of the cigarette. One end of this lumen is filled with tobacco 2. The other end, for placing in the mouth, has a filter 4.

Smoke drawn from the cigarette will pass through the filter 4 in the following manner. Entering the lowest

2

portion 10 of the filter 4, the smoke meets the wall 9 which is a partial obstruction in the lumen of the cigarette. The smoke is diverted through channel 11 between the partition 9 and the paper wall 3 into the filter area 12. Here it is again diverted by partition wall 8 into the opening 13—at the opposite side of the lumen from where channel 11 is situated—and through this opening 13 into the filter area 14 where another obstruction in the form of partition wall 7 directs the smoke through the opening 15 which is at the opposite side from where opening 13 was—into the filter area 16 where still another obstructing wall 6 directs the drawn smoke through the opening 17 which is at the opposite side from where opening 15 was—into the filter portion 18 from which the smoke leaves the cigarette.

It can be seen that the smoke was caused to travel sideways as well as upwards. In this case the smoke has traveled about twice as far as it could have gone in a conventional cigarette filter occupying the same space.

As a result of having traversed this greater area the smoke solids had more action from purifying elements in the filter. Since the smoke did not rush straight through the filter as it does with present filter tips but traversed more filter area and spent more time in the filter, more of its heat could be dissipated.

These partial partitions in the filter also affect the draft through the lumen of the cigarette and make for a slower burning of the tobacco.

The fragmentary portion of cigarette 1 in FIGURE 2 has two partition walls 21 and 22 instead of the four walls shown in FIGURE 1. This means easier drawing for the smoker but, of course, it may also mean less filtering. The number of partial partitions or obstructing walls may vary from one upwards depending on the amount of filtering or cooling desired.

The methods of construction are varied and numerous and the smoke guides or partial partitions may be made of any material through which smoke will not readily pass; for example, cellophane, thin plastic sheathing, cork, wood, plain paper, cardboard, waxed paper, or even a slightly bibulous material such as thin blotting paper which is in itself a filter and will not entirely obstruct the smoke like, for example, waxed paper.

The jutting partitions may also be made with paste, glue, varnish, or by applying a layer of size, starch, sealing material such as the higher fusing waxes or paraffins. Any suitable plastic cement can be used and of course any thin foil; for example, tin or aluminum or silver foil. The metallic foils, in addition to being good obstruction means, are also excellent dissipators of heat, leading to much cooler smoke. In general, any material may be used which will act as a smoke stopper and will not alter the taste of the smoke, will not be poisonous or toxic if it should by accident reach the mouth, and will not be too flammable should it by chance catch on fire.

The methods of manufacture are very numerous and in FIGURE 3 one method is shown. Here the filter is composed of three sections—upper section 27, middle section 28, and lower section 29. On the lower surface 23 of top section 27 the plastic sheath 21 has been positioned. On the lower surface 24 of the middle section 28 the wall 22 has been placed.

The three parts 27, 28, and 29 are now brought together and held together, by pressure or proper gluing either on the under surfaces of the inserts, or by gluing or pasting to the wall of the cigarette.

The filter 4 in FIGURE 2 is the result of assembling the parts of FIGURE 3. Note that the insert 22 in FIGURE 2 was placed so that the smoke corridor 31 would be on the opposite side of smoke corridor 30 opposite insert 21.

These directing walls—like 21 and 22 in FIGURE 3—

3

may also be constructed by making a slit at the desired site, the size and shape of the wall to be, and then filling the slit with suitable material; for example, tin foil, high fusing wax, glass fibre cloth, any suitable sealing material, or any of the many other suitable materials.

In FIGURE 4 the directing walls 33 and 34 are arranged to change the course of the smoke in a lesser degree than in FIGURE 1 or FIGURE 2 and to allow a small amount of smoke to go through in a straight path without being traveled an extra distance for more filtering or cooling. Here both directing walls point upwards and the extreme tips 36 and 37 of walls 33 and 34 do not quite reach the center of the lumen so that a clear channel 35 is created which is unimpeded from the tobacco filter junction 38 to the mouth end 5 of the filter.

The size, shape, and number of the impeding walls and their situation naturally determine the extra distance the smoke will travel.

Where very small impeding walls are desired they can be formed in the filter by crimping or pinching the filter in the proper areas to create the desired obstructions for changing the course of some of the smoke.

In FIGURE 5 the walls are aligned so that all of the smoke must reverse its course twice before reaching the mouth of the smoker. As the smoke is drawn into the tobacco-filter junction 38 its passage upward is directed by the walls 40 and 41 into the channels 42 and 42' where it reverses its direction and travels downwards until reaching the opening 43 between the walls 44 and 45. There, the direction of the smoke is again reversed to go upward through the filter to the smoker. This reversing of direction which provides more traveling area than the length of the filter would suggest and provides more time for action on the smoke the filter properties results in considerable cooling and more efficient filtering of the smoke.

The filter 4 in FIGURE 6 is made from a number of strands of filter rope. By filter rope is meant a long, thin strand of filter whose walls are to some degree smoke impermeable and which can be twisted around each other to create a spiral form. Thus, smoke drawn into any strand of filter rope will follow a spiral path which affords a greater traveling distance than the straight line of the regular straight filter.

In this FIGURE 6, 48 is the mouth of the strand 51 at the tobacco filter junction 38, from where the smoke is drawn upward. That portion of the strand which circles the back is shown by the dotted lines 49. Finally, strand 51 can be seen to discharge its smoke through the opening 50.

The mouth end of the filter illustrated in FIGURE 6 is shown in FIGURE 7 and here you can see the seven strands that make up this filter. Their number, can, of course, be varied.

In FIGURE 8 all the strands have been removed with the lone exception of strand 51 so that its course can be followed from its mouth 48 at the bottom 38 of the filter to its discharge opening 50 at the top end 5 of the filter, and the spiral more clearly seen.

FIGURE 9 is a sectional view taken substantially on a line A—A' of FIGURE 1 in which an obstructing wall 6 causes the smoke to pass through the filter at the point 17. By altering the wall 6 the passage in the filter can be made larger or smaller. If wall 6 is enlarged there is a smaller channel for the smoke and its travel will be slowed. Because the smoke cannot be drawn through the wall 6 expediently, when it reaches the wall 6, the smoke will be directed sideways towards the opening 17 for passage.

In FIGURE 10 wall 55 is approximately in the center of the filter 4. As smoke is drawn through this arrangement it passes only through the sides 57. This obstruction can be placed anywhere in the filter or may be attached to the base of the filter.

4

In FIGURE 11 the obstruction 56 takes the form of an annular ring on the periphery of the filter 4. Smoke must pass through the center 58 of the circular obstruction 56. The obstruction 55 illustrated in FIGURE 10 and the obstruction 56 illustrated in FIGURE 11 may be used in conjunction with each other and built into the same filter. Or—each or both may be combined with any other type of obstructing partition.

The forms that may be taken by this device are numerous and the ones given above are merely illustrative. It will be apparent that many variations of such forms may be utilized without departing from the spirit of the invention as defined by the following claims:

I claim:

1. In a filter type cigarette including tobacco portion and a filter portion enclosed in a wrapper, said filter portion consisting of porous filter material and at least two pairs of baffles embedded in the porous material each pair of baffles forming arms disposed in V formation, the apex of each pair of baffles pointing toward the tobacco portion of the cigarette, a first pair of baffles extending inwardly from said wrapper, the apex of said first pair of baffles being open to provide a passage for smoke therethrough and positioned in slight axial overlapping relation to the arms of a second pair of baffles positioned between said first pair of baffles and said tobacco portion of the cigarette, the arms of said second pair of baffles being joined at their apex and being spaced from the wrapper at their free ends to provide passages for smoke adjacent said wrapper.

2. A filter for a cigarette of the type comprising a tobacco portion and a filter portion secured together by a wrapper, said filter portion comprising a mass of porous filter material, at least two pairs of baffles embedded in said porous filter material, a first said pair of baffles being arranged to lie one in each of two planes intersecting each other at the axis of the cigarette, the baffles of said first pair of baffles extending to the line of intersection of said planes forming the apex of a V, the baffles forming the two arms of the V, the ends of the arms remote from said apex being spaced from said wrapper to provide a passage for smoke between said arms and said wrapper, a second pair of baffles being arranged to lie in intersecting planes parallel to but spaced from the planes of said first pair of baffles, said second pair of baffles extending from said wrapper inwardly to a point between the arms of said first pair of baffles, but short of the line of intersection of said planes to provide an open apex, whereby smoke passing through said porous filter material must reverse its direction of flow at least twice.

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