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 [73] Assignee **International Automated Electronics Corporation**

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[54] **CIGARETTE FILTER**
 7 Claims, 4 Drawing Figs.

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 131/261

[51] Int. Cl. **A24d 01/04,**
 A24f 01/08, A24f 01/16

[50] Field of Search 131/10.3,
 10 A, 11, 10.5, 10.7, 261 B, 201, 211, 212, 213

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ABSTRACT: A tobacco filter including a plurality of metallic foraminous plates for cooling smoke during passage therethrough. A baffle plate is inserted in the smoke stream for causing impinging contact between tobacco smoke and the baffle plate causing the depositing of tar thereon. Conical members are disposed on both sides of the baffle plate to cause acceleration of a smoke stream against the impinging surface of the baffle plate and deceleration of smoke flow on the other side of the baffle plate. Filtration is achieved by small granules of sandstone or gravel. The lip engaging portion of the cigarette filter includes a shredded paper end which is turned inwardly to provide further filtering.

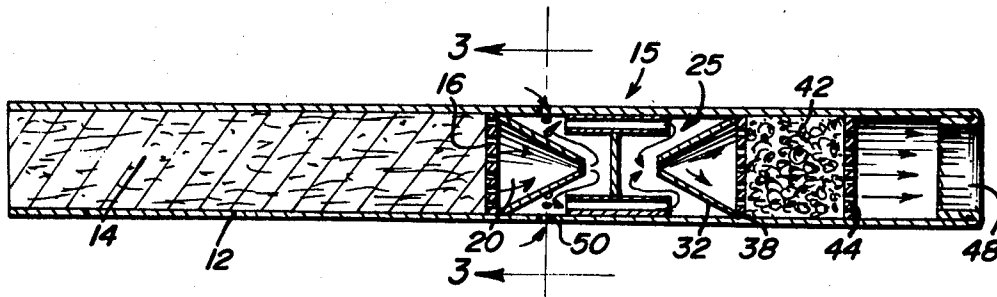


Fig. 1

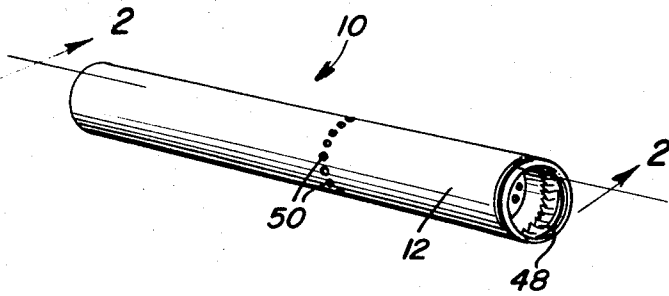


Fig. 3

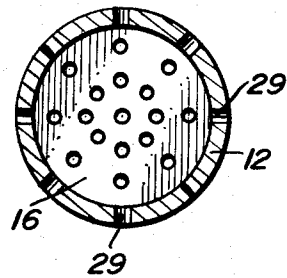


Fig. 2

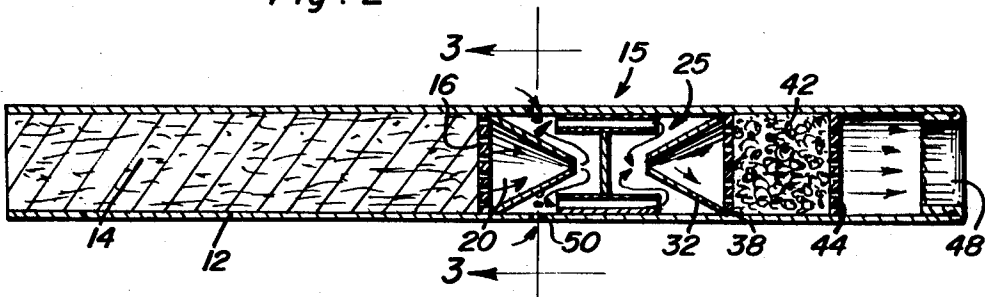
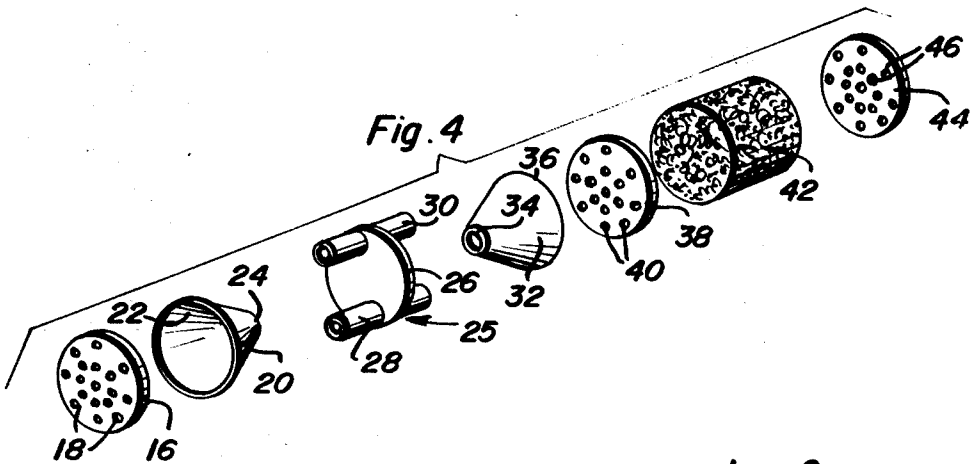


Fig. 4



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CIGARETTE FILTER

The present invention relates to cigarette filters including multiple elements.

In the past, a wide variety of cigarette filters have been devised and utilized. Generally, these filters include cellulose packing material or charcoal which absorbs a certain amount of irritants from the cigarette smoke passing through the filter. However, it has been found that as the filter becomes more effective, the quantity and strength of smoke inhaled by the smoker is decreased so that he does not realize smoking satisfaction obtainable from a cigarette without a filter. Further, conventional filters make no provision for reducing heat in the smoke which causes tongue bite.

The present invention includes multiple filtration and heat absorbing elements which absorb a substantial amount of heat from passing smoke. Further, means are provided for reducing the tar content of the filtered smoke without diminishing the quality of inhaled smoke. Further, vent means are provided in the filter for allowing smooth draw by the smoker.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIG. 1 is a perspective view illustrating a cigarette having the filter structure of the present invention.

FIG. 2 is a longitudinal sectional view taken along a plane passing along section line 2-2 of FIG. 1 exposing the interior components of the cigarette filter.

FIG. 3 is a transverse sectional view taken along a plane passing along section line 3-3 of FIG. 2.

FIG. 4 is an exploded view particularly illustrating the individual components which makeup the cigarette filter of the present invention.

Referring to FIG. 1, a cigarette is generally indicated by the numeral 10 will be seen to include the filter structure of the present invention. However, it is to be emphasized that the filter structure per se may be constructed as an accessory into which plain cigarettes are inserted. Further, the cigarette structure may be incorporated in a mouthpiece for use with cigars. Still further, the filter may be included within the stem portion of a smoking pipe. However, for purposes of convenience the present discussion will be directed to incorporation of the filter structure in a cigarette.

The filter structure includes a paper sleeve 12 which extends over the entire length of the cigarette. As will be seen by referring to FIG. 2, the forward portion of the cigarette includes tobacco 14 which generates the smoke to be filtered by the filter components generally indicated by reference numeral 15. A disc-shaped foraminous metallic plate 16 is disposed at the inward end of the tobacco portion 14. As will be seen from FIG. 4, the disc includes apertures 18 therein to permit the passage of smoke therethrough. However, during such passage, a substantial quantity of heat is absorbed by the metallic plate thereby decreasing the effect of tongue bite experienced by the smoker.

A conical member 20 fabricated from a suitable material such as plastic, paper, metal or the like includes an open base 22 and an aperture formed in the apex 24 thereof. The base 22 is disposed against the free surface of the foraminous plate 16. The cone functions as a means for accelerating the smoke stream as it passes through the foraminous plate 16. A baffle or deflection plate 25 is positioned in close proximity to the apex portion 24 of the conical member 20. The baffle plate 25 includes a disc-shaped portion 26 disposed in spaced parallel relation with the foraminous plate 16. Diametrically opposite apertures are formed along the periphery of the body portion 26 and elongated tubes 28 and 30, integrally attached to the body portion 26 extend coaxially parallel with the sleeve axis. As will be seen from FIG. 2, the apex portion 24 of the cone member 20 is positioned between the tubular elements 28 and

30 with sufficient space therebetween to allow the passage of accelerated smoke from the aperture in the apex portion 24 of the conical member 20 resulting in the impinging of this smoke on the disc body 26 of the baffle plate 25. As a result of this impinging action, tar from the smoke is deposited upon the body portion 26. The smoke is then free to flow through the tubular elements 28 and 30 for further passage through the filter.

A second conical member 32 is disposed on the opposite side of the baffle plate 25. As in the case of the first mentioned baffle plate, the baffle plate includes an aperture formed in the apex portion 34 thereof and an opened base 36. The conical portion 34 is positioned between the tubular elements 28 and 30 of the baffle plate in symmetrical relation with the first mentioned conical member 20. The second conical member decelerates the flow of smoke after the smoke exists from the tubular elements 28 and 30 of the baffle plate 25.

A second foraminous plate 38 having apertures 40 therein is identical to the first mentioned foraminous plate 16 and is positioned against the base 36 of the conical member 32 in the same manner as described in connection with the first mentioned foraminous plate 16.

To the terminal end of the filter structure, a plug of filtering material 42 is positioned in sleeve 12 and includes a first edge forming an interface with the free surface of foraminous plate 38. The plug is preferably fabricated from small granules of sandstone gravel which has been found to have superior filtering qualities as compared to cellulose, charcoal and other conventional materials. This is due to the sandstone's capability to filter minute materials. However, instead of the sandstone granules, these conventional materials may be utilized. The outward end of the filtering plug 42 forms an interface with a third foraminous plate 44 substantially identical to the aforementioned foraminous plates 38 and 16. The third foraminous plate 44 includes apertures 46 therein to permit the relatively easy draw of smoke therethrough.

The outward ends of sleeve 12 is longitudinally shreaded and the resulting strips are turned inwardly to further filter the smoke passing therethrough.

Circumferentially disposed vent holes 50 are formed in sleeve 12 at a point intermediate the base 22 and apex portion 24 of conical member 20. Inclusion of the tiny air vents will further cool and add oxygen to the smoke making for a more comfortable utilization of the tobacco product.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.

I claim:

1. A tobacco filter device adapted to operate upon a flow stream of smoke comprising a filter portion enclosed within a sleeve section, at least one foraminous plate disposed in the sleeve section and oriented generally perpendicularly to the flow stream for absorbing heat therefrom, the plate having apertures therein to allow the passage of smoke therethrough, wherein the sleeve section further encloses two of said foraminous plates in parallel spaced relation, a baffle plate disposed intermediate the foraminous plates upon which a smoke stream impinges and deposits tar, channel means attached to the baffle plate for guiding the smoke stream through the baffle plate, and conical members opened at the base and apex portions thereof, the conical members being positioned adjacent the foraminous plates and convergently positioned toward each other with the baffle plate interposed therebetween to cause acceleration of the smoke flow against one side of the baffle plate and deceleration of the flow upon exit from the channel means.

2. The filter structure set forth in claim 1 wherein the baffle plate comprises a disc-shaped web disposed perpendicularly to the smoke stream, the channel means being tubular ele-

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ments attached at diametrically opposite points along the web perimeter, the tubular elements extending perpendicularly of the web and permitting the passage of smoke therethrough after impinging upon the web.

3. The filter structure set forth in claim 2 together with vent holes formed around the perimeter of the sleeve to permit the introduction of outside air into a space between a first encountered conical member and an associated surface of the baffle plate for effecting the introduction of oxygen into the smoke and further causing the cooling thereof.

4. The structure set forth in claim 3 in which said filter portion comprises a plug of filtering material disposed in the sleeve for causing filtration of irritants from smoke passing

therethrough.

5. The filter structure set forth in claim 4 wherein the filtering plug comprises relatively small granules of sandstone gravel.

6. The filter structure set forth in claim 5 together with an additional foraminous plate disposed immediately inwardly of the lip engaging end of said sleeve for causing additional cooling of the smoke delivered to a smoker.

7. The filter structure set forth in claim 6 wherein the lip engaging portion of the sleeve section is shredded and includes inwardly turned shredded strips to effect additional filtering of smoke delivered to the smoker.

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