Oct. 4, 1960 H. A. LEBERT 2,954,778

AUXILIARY FILTRATION MEANS FOR FILTER-TYPE CIGARETTES

Filed Nov. 16, 1956

Fig. 1

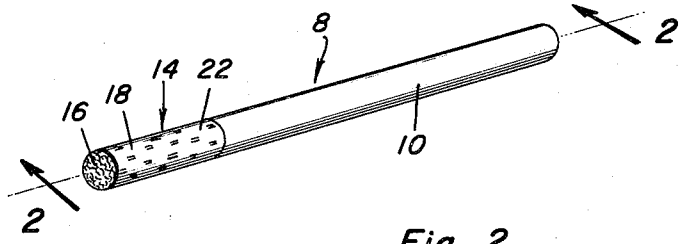


Fig. 2

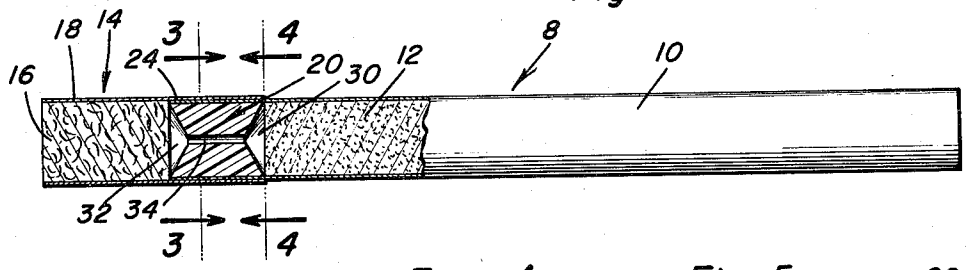


Fig. 3

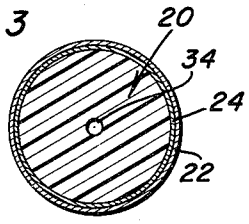


Fig. 4

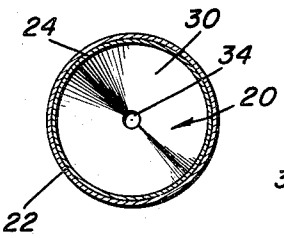


Fig. 5

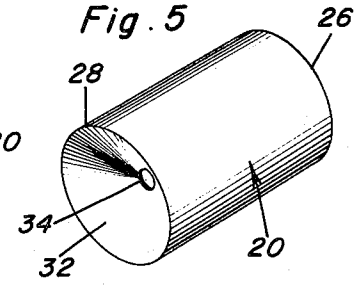


Fig. 6

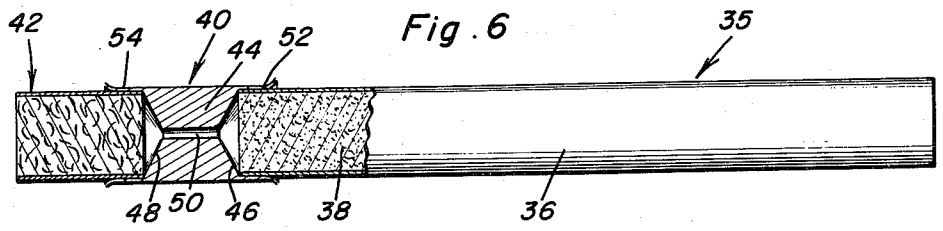
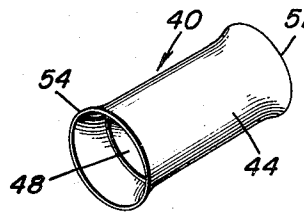


Fig. 7



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AUXILIARY FILTRATION MEANS FOR FILTER-TYPE CIGARETTES

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1 Claim. (Cl. 131—187)

This invention relates to a novel method and means for removing tars and other deleterious substances from tobacco smoke.

More specifically, the concept comprehends the use of practical filtration means, of one form or another, which has to do with a suitable venturi device through which the smoke is drawn and forced under pressure, said device having a passage or orifice with a venturi-restriction so that the smoke, upon discharge at the proximal or discharge end of the passage, is directed at a barrier with smoke tars being impinged upon the barrier.

In addition, the pressure in and through the passage of the device creates a high velocity and forces the smoke against a barrier or baffle, a filter-tip for example, and in so doing causes the tars and distillation products to collect and deposit on and adhere to the rearward surface of the filter.

Briefly summarized, the inventive concept herein disclosed is as follows:

A venturi or small orifice of critical size (.0006 to .0007 square inch in area) the dimension of which can be slightly increased or decreased depending on the amount of tar removal desired in relation to the ease of draw that is desired.

An impingement barrier on the discharge side and close to the venturi orifice or passage whereby tars are impinged upon the impingement barrier.

In carrying out a preferred embodiment of the invention the ready-to-use adaptation comprehends, in combination, a conventional cigarette, a filter-tip therefor which may be connected to or utilized separately from the cigarette, means being interposed between and communicatively joining the cigarette and filter-tip, said means having a smoke passage therethrough embodying a centralized venturi-restriction. The underlying principle involved in the foregoing assemblage and any equivalent variations thereof involves drawing and forcing smoke from the inner end of the cigarette through the passage, including the venturi-restriction, thereby increasing its velocity and directing the high velocity smoke stream against a barrier positioned upstream of the discharge end of the smoking structure for removal of heavy tars and other deleterious substances from the tobacco smoke.

Other objects, features and advantages will become more readily apparent as the following description proceeds and the accompanying drawing.

In the drawing, wherein like numerals are employed to designate like parts throughout the views:

Fig. 1 is a perspective view of a cigarette with the improved filtration means embodied in the filter-tip and ready for use;

Fig. 2 is a view in elevation, on an enlarged scale, with portions broken away and appearing in section and taken approximately on the plane of the line 2—2 of Fig. 1;

Figs. 3 and 4 are enlarged cross-sections on the lines 3—3 and 4—4, respectively, of Fig. 2;

Fig. 5 is an enlarged perspective view of one embodiment of the auxiliary filtration device;

Fig. 6 is a view similar to Fig. 2 but showing a modification of the invention; and

Fig. 7 is a perspective view of the filtration device depicted in Fig. 6.

With reference first to Figs. 1 to 5 inclusive, the cigarette 8 is conventional and is characterized, as usual, by a paper wrapper or cylinder 10 containing the usual filler of tobacco 12. The filter-tip 14 comprises a suitable filter 16 and a sleeve-like jacket and connector 18 therefor. In the instant invention in order to make room for the inserted filtration device or means 20 the forward end portion of the jacket 18 is elongated at 22 and the extended end portion 24 of the wrapper 10 is telescopically fitted therein and suitably connected thereto. It is in this space between the tobacco filler 12 and the filter 16 that the added or auxiliary filtration means or device 20 is mounted. It is to be stated here that the device 20 can be made of metal, commercial plastics of an appropriate grade or any molded material. It can be incorporated in the cigarette at the time of manufacture, as is obvious, or made separately as seen in Figs. 6 and 7. It is of proper diameter and length, as shown, and is preferably circular in cross-section. As seen in Figure 5 the intake or distal end is denoted at 26 and the discharge or proximal end at 28. Concave depressions are formed in the respective end portions and define an intake chamber or pocket 30 (Fig. 2) and a discharge chamber or pocket 32. The axial bore, which constitutes the venturi-restriction is denoted at 34. The body is therefore said to have a passage through, including the concavities or recesses 32 and an intervening venturi-restriction 34.

In the modification seen in Figs. 6 and 7 the cigarette, which may be said to be a regular type minus the popular filter-tip, is denoted by the numeral 35 and the wrapper at 36 and the tobacco filler at 38. It may be stated in this connection that it is within the purview of the invention to utilize either the regular or filter-type cigarette. In fact one may purchase filter-type cigarettes and cut or remove the filter-tip therefrom and use it in the manner seen in Fig. 6. Or, the filter-tip may be made and sold separately for use in conjunction with the novel added auxiliary filtration device 40. In any event the filter-tip is denoted by the numeral 42. The device 40 is basically the same as the device 20 but is generally made of metal although other materials may, obviously, be employed. It is more in the nature of a coupling. To this end the cylindrical body portion 44 has an axial restricted-venturi bore therethrough opening into the respective concavities or recesses 46 and 48 comparable to the recesses 30 and 32 already mentioned. The bore is denoted at 50. Here again the bore and recesses provide an open ended passage in communication with the cigarette. Bell-mouth cups are added on the respective ends one cup being denoted at 52 for the reception of the end of the cigarette as seen in Fig. 6 and the other bell-mouth cup being denoted at 54 for reception of the filter 42.

As is perhaps clear the passage area or diameter of the passage or orifice 50 can be varied to meet the particular degree of filter action desired. In typical samples which have been used a diameter of 1/32 of an inch has been used as a compromise for an acceptable taste requirement. The area of the passage may comprise approximately .0007 square inch which corresponds to the area of a hole having a diameter of 1/32 of an inch.

In both forms of the invention it will be seen that the smoke from the cigarette is drawn into the pocket 30 or 46 as the case may be and is forced through the bore 34 or 50 at which time its velocity is increased. The

barrier inner end of the filter 14 or 42 provides a baffle, that is an impingement baffle for the tars and other deleterious impurities. It follows that the unwanted distilaltion products and particles are precipitated out of the smoke before it is drawn by way of the filter-tip into the mouth of the user.

Repeated experiments with the embodiments of the invention herein disclosed have revealed that the invention aptly and efficaciously fulfills the purposes for which it is intended and constitutes a worthwhile advance in the art to which it relates.

Minor changes in shape, size, materials and rearrangement of parts may be resorted to in actual practice without departing from the spirit of the invention or the scope of the invention as claimed.

What is claimed as new is as follows:

In a tobacco smoking structure comprising a cigarette holder including a body having a longitudinal smoke passage therethrough and a filter tip of filtering material in one end of said body, said passage including orifice defining means having an overall cross-sectional area of approximately .0007 of a square inch for accelerating tobacco smoke at high velocity through the holder, said body having at opposite ends generally cylindrical recesses terminating inwardly in said passage, one of said recesses being formed to receive the end of a cigarette and the other being formed to receive and support said filter tip, said tip end of the holder body being constructed to support an end face of the tip in close proximity to a discharge end of said passage so as to form an impingement barrier on the tip at the downstream side of said smoke passage, said impingement barrier presenting a flow-interrupting mass of solid matter in the path of and confronting substantially all of the smoke in the stream whereby harmful tar particles are deposited upon the barrier substantially solely by impingement as distinguished from expansion, the recess for receiving said tip being of shorter longitudinal length than that of said tip so that said filter tip may project outwardly from the confines of the holder for engagement by the mouth of the user.

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