AIR-ADMIXED CIGARETTE UTILIZING RESTRICTIVE-FLOW ORIFICE

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Fig. 1

Fig. 2

Fig. 3

Fig. 4

Fig. 5

Fig. 6

Fig. 7

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This invention relates to a cigarette and provides means to utilize an axially arranged restrictive-flow orifice for mainstream smoke intermixed with ambient air intake which the user draws into a cigarette proper between the filler thereof and a zone spaced from the ignition end of the cigarette to effect a less concentrated "tar" content smoke intake into the mouth and also effect a reduction of "tar" from the smoke-air mixture itself.

This invention may be carried out in various forms without limitation as to constituents, composition, dimensions, construction, or proportions and the like, some examples being shown in the accompanying drawing wherein:

FIG. 1 is a side elevation of one form of cigarette made according to the instant invention;

FIG. 2 is a central longitudinal section through the cigarette of FIG. 1;

FIG. 3 is an enlarged cross section taken on the plane of line 3—3 of FIG. 2;

FIG. 4 is a fragmentary longitudinal section through a modified form taken on the same plane as FIG. 2;

FIG. 5 is an enlarged cross section taken on the plane of line 5—5 of FIG. 4;

FIG. 6 is a fragmentary longitudinal section taken through a second modified form on the same plane as FIG. 2; and

FIG. 7 is a fragmentary longitudinal section through a third modified form taken on the same plane as FIG. 2.

It is to be noted that cross sections taken through the planes of the perforations in FIGS. 6 and 7 would be like FIGS. 3 and 5, respectively.

The cigarette illustrated in the shown examples comprises elements A and B. Element A may represent the filler portion of a cigarette of a usual, but not necessarily, commercial size and variety approximately 3 1/2 inches in the overall cigarette length with a diameter of 5/8". The wrapper of the cigarette element A, which is shown at 10, may be the usual paper, beech leaf or any equivalent material and it contains acceptably packed and rolled filler such as tobacco 11 in granulated condition. Element B which enables the carrying out of my invention is usually shorter than cigarette element A and approximately 1" long, for example. Such element B may be considered as a mouthpiece and holder for the element A since the distal end is obviously adapted to be supported between the lips and the distal end of element A is obviously adapted for ignition. The mouthpiece or element B basically is a tube 12 which carries the filler element A over-
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lapped for a short distance, as shown, into the rolled tube with the contacting surfaces of both wrapper 10 and tube 12 joined and sealed by a suitable adhesive or binding agent.

Said tube 12 may be made of stiff paper or the like.

In each tube 12 is located a transverse disc or plate 13 which is spaced from both ends of the tube 12.

Said elements A and B, for convenience, may be considered as outer and inner, respectively.

Each disc or plate 13 has a central opening or orifice 14 through which the smoke is constrained to travel by draft into the mouth. In the form of FIGS. 1 to 3 the plate or disc is spaced from the filter medium. As shown, rims 15 and 16 space it from adjacent filter media or elements 17 and 18, respectively, which may be employed and also provide clearance at 19 and 20. Rim 16 for said clearance 20 is of sufficient depth to provide a suitable chamber for the intake of ambient air through registering perforations or pin holes 21 in the walls formed by tube 12 and rim 16. Said perforations 21 are arranged in an annular row and are spaced from the filter element 18. The size of the orifice 14 and the size and number of perforations 21 are of such restrictive magnitude as to effect a desired uniform smoke-air mixture ratio; for example, orifice 14 may be of a diameter of 0.04 inch and each perforation 21 (although enlarged with drawing for clearance) may be of a diameter of 0.003 inch. Attention is called to the fact that the rim 15 spaces the plate or disc 13 from the filter 17 so that the space 19 is of such depth as to accommodate jet stream impingement for "rat" deposition.

In the use of the specific form of FIGS. 1 to 3, for example, the smoker draws upon the mouthpiece element B while the filler element A is lighted. The resultant smoke passes through the filter medium 18 and is drawn into the chamber 20. Simultaneously, an amount of outside or ambient air is drawn into the chamber 20 through the side wall perforations 21. Within the chamber 20 the mainstream smoke coming from the filler element A admixes with the air-intake through perforations 21. The resistance as set up to the smoke-air mixture as it passes through orifice 14 slows its advance. The intimately mixed smoke-air mixture at an overall slower rate of flow leaves the orifice 14 at such velocity and in a stream or jet that impinges upon the adjacent surface of the filter medium 17 across the recessed space 19. The striking stream leaves a concentrated "rat" deposit at the surface contact area of the filter medium 17. The smoke-air mixture then spreads and is distributed over the entire cross-sectional area of and throughout the filter medium 17 and thence enters the mouth of the smoker.

The flow rate of the smoke in the lighted and drawn-upon cigarette is controlled by the rate of flow of the smoke through the orifice 14 of element B. Since the rate of flow has been lowered in the drawn-upon smoke through the element B the entire smoking process has been slowed. The lowered rate has been effective from the start of smoking at the full length of the cigarette down to the shortest length at the culmination of smoking. Because of the orifice control or throttling effect, there will be a nominal equalization of the rate of smoke-flow throughout the entire smoking cycle. This attained uniformity of smoke-flow effects a uniform smoke-air mixture ratio over the entire smoking cycle.

Where the reference characters pertinent to the modified forms apply, they have been used.

4. The form of FIGS. 4 and 5 differs from that of FIGS. 1 to 3 only in that the filter element 18c, corresponding to that at 18a, may be longer, the chamber 20c, corresponding to that at 20, may be shorter and the perforations 21c, corresponding to those at 21, may be in one or more rows or transverse planes passing through the filter element here designated 18c as stated.

The form of FIG. 6 substantially conforms to that of FIG. 2, primarily omitting the filter element 17.

The form of FIG. 7 substantially conforms to that of FIG. 4, primarily omitting the filter element 17.

It is to be emphasized that the illustrations as shown in the examples are only some of the ways or means to accomplish the aims of this invention; since smoking is a matter of tastes and personal requirements, cigarettes may be made in varieties within the scope and intent of this invention to cover different prerequisites of smoking as the various suggested examples make clear, and it will also be clear that the function and results mentioned with respect to FIGS. 1 to 3 are true in those forms where like or corresponding parts and features are employed.

I claim as my invention:

1. A cigarette or the like having a filter, a mouth end portion, transverse means located within said mouth end portion of the cigarette, filter medium adjacent to said transverse means, said transverse means having an orifice to constrain into a jet stream the flow of smoke therethrough, there being a recess at each face of said transverse means with the recess at the mouth end side of said transverse means spaced to effect jet stream impingement, said orifice of said transverse means being of such size as to afford substantial resistance to the flow of smoke during the smoking thereof, and at the filter side of said transverse means there being perforations or openings in the wall of the cigarette at the mouth end portion for ingress of air for admixture with the mainstream smoke from the ignited filter.

2. A cigarette or the like according to claim 1 wherein said transverse means throughout its major area is a substantially flat disc.

3. A cigarette or the like according to claim 1 wherein there is a second filter medium, said filter mediums being located respectively on opposite sides of said transverse means.

4. A cigarette or the like according to claim 1 wherein there is a second filter medium, said filter mediums being located respectively on opposite sides of said transverse means and the latter having a rim projecting therefrom at each face.

5. A cigarette or the like according to claim 4 wherein the perforating is extended through one of said rims.

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