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[54] **DEVICE FOR COMPENSATING THE
 INCOMPLETE NONHOMOGENEOUS BURNING
 PROCESS OF TOBACCO PREFERABLY IN THE
 FORM OF CIGARETTES**
4 Claims, 4 Drawing Figs.

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[56]

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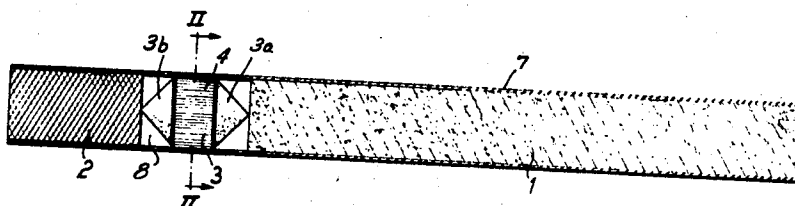
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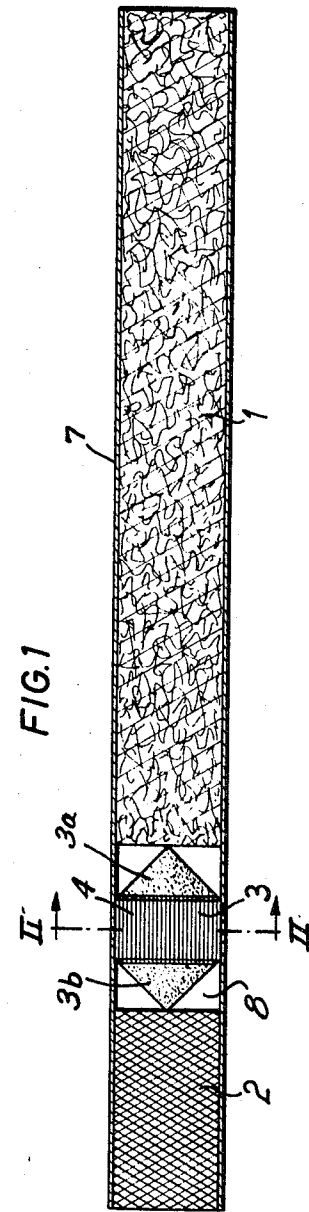
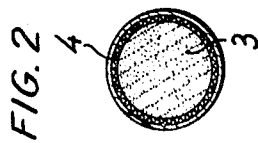
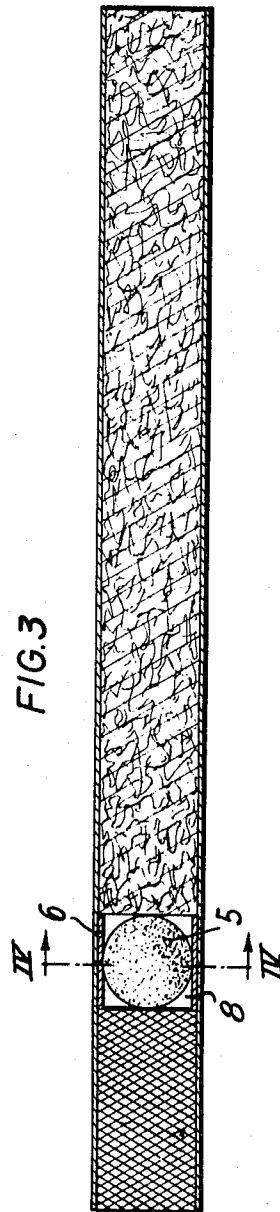
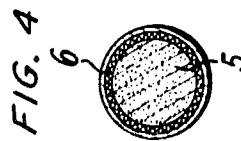
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ABSTRACT: A tobacco smoking device particularly in the form of cigarettes having an insert member disposed behind the tobacco filler for deviating the smoke radially outwardly within the envelope.





DEVICE FOR COMPENSATING THE INCOMPLETE NONHOMOGENEOUS BURNING PROCESS OF TOBACCO PREFERABLY IN THE FORM OF CIGARETTES

The statistics about the various health dangers to which the cigar and pipe smokers as well as the cigarette smokers are exposed have stimulated observations and tests which have lead to the following recognition.

1. The more homogeneously the burning process of tobacco takes place the smaller is the amount of the partly or incompletely burned char substances and of the CO-content of the smoke.

2. As indicator for the appropriate character of the burning process is considered the measuring of the distribution of the electrical charge density in the smoke volume under the condition that the normally applied burning process is simulated.

3. The pipe smoker, for example, is careful when lighting the tobacco filler, that the entire surface is ignited uniformly. In view of the long suction canal of the pipe this assures in a better way a positive mixture of the air oxygen with the burning products.

4. There is a similar situation for many cigars which are smoked. A good cigar burns as a rule evenly without forming an extreme glow cone. In this case one can expect here also a homogeneous burning process. Accordingly one can already draw conclusions from the form of the glow surface with respect to the homogeneity of the burning process.

5. The situation is different, however, during the burning process of tobacco within a cigarette.

Very soon after igniting the cigarette the known glow cone is formed and it becomes more pointed the stronger the suction is. This can be pushed to the extent that the cigarette burns practically only at the surface and directly under the paper envelope while the coked tobacco core remains.

From this may logically be concluded that the burning process of tobacco within cigarettes takes place in a very non-homogeneous manner. According to physical laws the combustion air that is drawing in will take the path of smallest resistance. The least suction resistance is present in the circular burning zone in the paper envelope at the edge of the glow zone. If one draws on a cigarette which is already ignited the circular burning zone of the paper enclosure glows first. Only thereafter the glowing of the glow cone occurs. The consequence is that with approximately laminar flowing in the extreme zone of the tobacco filler, thus directly under the paper envelope, a relatively oxygen-rich burning product is drawn in, while from the axial core of the cigarette filler badly burned, oxygen poor products are drawn in. The more one draws on the cigarette the worse becomes the mixing process in the cigarette. The consequence is that the mixing process of the nonhomogeneous smoke parts takes place at the earliest in the oral cavity and in the breathing tract.

As a matter of fact the cigarette according to the aforementioned knowledge is a wrong construction when viewed on the basis of combustion techniques. Nevertheless it has been able to win an enormous portion of the market because it makes possible a tobacco consumption in small amounts and requires no additional utensils. Accordingly there remains only the possibility of compensating the incompleteness of the burning process by subsequent measures.

Methods are known already which show trends in this direction. Ordinarily one employs nozzle-shaped restrictions in the axial range of a cigarette holder or of a smoking device in combination with baffle or striking surfaces which produce a separation of smoke condensates. However, these methods start from erroneous conceptions. Also the provision of aerating slots in the paper envelope in the area between the fiber filter and the tobacco filler cannot lead to the desired success according to the mentioned knowledge and information. If after the complete smoking of a cigarette one cuts in half the remaining filter in a longitudinal direction one can recognize in most cases that the brown coloration of the fiber material in

the zone directly under the outer envelope is the lightest. The filter is thus not coated homogeneously with smoke condensate.

Accordingly it is an object of the invention to take measures which move back the mixing process from the oral cavity into the region of the cigarette.

In order to provide a solution for the above-mentioned problem the invention proposes that for a tobacco smoking device such as a cigarette, cigar or for holders of cigarettes or cigars an insert member of impervious, tasteless material is employed in the smoking canal which deviates the smoke portion flowing in the tobacco filler and being poor in oxygen radially into a flowing zone surrounding the insert member and being rich in oxygen to thus compensate the incomplete nonhomogeneous burning process. Thus for a filter cigarette an insert member being of a ball, cylinder, cone or approximately egg shape is mounted in the zone between the fiber filter and the tobacco filler, this insert member consisting of pressed cellular material, a synthetic substance or wood. The insert member fills up the entire cross section of the cigarette to such an extent that a nozzle effect is produced in the immediate vicinity of the paper envelope and the desired positive mixing is made possible with the largest possible surface conditions. The paper envelope in the area of the insert must be stiffened in a suitable manner so as to prevent the penetration of humidity and wetness, which would lead otherwise to a clogging of the circular nozzle gap due to suction. It is further possible to select the insert member so large that it fills up the entire cross section of the cigarette. In this case one can provide either circumferentially disposed grooves in the longitudinal direction at the surface of the insert member or at the inner surface of the envelope which may be disposed alternately for the purpose of extending the mixing path also helically. As a result of the above described measures the following observations can be made.

1. The coating of the fiber filter with smoke condensates is more uniform.

2. An experienced smoker can distinguish a prepared cigarette which is not different on the outside from a normal cigarette already by the fact that the inhaled smoke of the prepared cigarette neither bites nor scratches without impairing the taste and has been felt therefore to be lighter in all test cases.

3. The electrophysical determination of the excess charge of a polarity in the smoke volume showed a reduction of the charge excess in the case of the cigarette prepared according to the invention by 70 percent on the average. The features and advantages of the invention will further appear from the following description made in reference to the accompanying drawings showing as embodiments of the invention two filter cigarettes, in which:

FIG. 1 shows a longitudinal section through a filter cigarette with an insert member having two opposite cone-shaped ends, the insert member being shown in a full side view;

FIG. 2 shows a cross section through line II—II in FIG. 1;

FIG. 3 shows a longitudinal section similar to that illustrated in FIG. 1, the insert member having the shape of a ball;

FIG. 4 shows a cross section through line IV—IV in FIG. 3. The two filter cigarettes shown in the drawings comprise a wrapper portion 7 in which a tobacco filler 1 and at a certain distance therefrom a fiber filter 2 is inserted.

Between the tobacco filler 1 and the fiber filter 2 is shown in FIG. 1 a cylindrical insert member 3 of impervious material having a neutral taste, this insert member terminating in two opposite cone points 3a and 3b. These cone points serve to hold the insert member in position between the fiber filter 2 and the tobacco filler 1 and for creating free smoke mixing spaces. At the periphery of the cylindrical portion of the insert member 3 along its circumference individual canals are provided by means of a surrounding corrugated strip or band 4, forming a series of narrow channels around the insert member 3, as it is seen from FIG. 2. The series of circumferentially arranged narrow channels may be also formed by grooves cut

into the cylindrical part of the insert member 3. An insert member 3 may have longitudinal grooves formed in cooperation with the wrapper portion 7 seen as narrow channels as may be seen from FIG. 1. By means of the insert 3 which fills up the smoke canal with the exception of the individual canals the nonhomogeneous portions of the smoke volume are deviated outwardly into the circular flow zone disposed directly under the paper envelope which is richer in oxygen and has a greater surface. The nozzle effect of the narrow individual canals supports the desired improved through-mixing of the two components especially in the free space 8 disposed directly in front of the fiber filter 2.

In FIG. 3 is shown as insert member 5 a smooth ball which is followed directly by a free space 8. The individual channels are formed here by a corrugated band 6 which bears from the inside against the paper envelope. These and similar inserts forcing the smoke radially outwardly can be employed also in filter cigars, in cigars with a tip as well as in cigarette and cigar holders with or without filter. The insert member can finally also replace a filter

We Claim:

1. A tobacco smoking device such as a cigarette or a cigar comprising in combination:

- a. a tubular wrapper portion;
- b. a tobacco filler within said wrapper portion;
- c. an insert member of impervious, neutral tasting material within said wrapper portion and disposed downstream of said tobacco filler, said insert member being surrounded by a series of circumferentially spaced, smoke-directing, narrow channels and having a downstream extension of concentrically diminishing shape;
- d. a free space disposed within said wrapper portion surrounding a portion of said insert member and

e. a filter downstream of said free space, said insert member also having an upstream extension, said extension comprising two convex surfaces which respectively engage said filter on one side and said tobacco filler on the other side to maintain said insert member in position.

2. A tobacco smoking device according to claim 1 wherein said circumferentially arranged narrow channels being formed by grooves pressed into a strip surrounding and contacting the outer surface of said insert member.

3. A tobacco smoking device such as a cigarette or cigar, comprising in combination:

- a. a tubular wrapper portion;
- b. a tobacco filler within said wrapper portion;
- c. an insert member of impervious, neutral tasting material within said wrapper portion and disposed downstream of said tobacco filler, said insert member being surrounded by a series of circumferentially spaced, smoke-directing narrow channels and having a downstream extension of concentrically diminishing shape;
- d. a free space disposed within said wrapper portion surrounding a portion of said insert member; and
- e. a filter downstream of said free space, said insert member also having an upstream extension, said extensions comprising two pointed extensions which respectively engage said filter on one side and said tobacco filler on the other side to maintain said insert member in position.

4. A tobacco smoking device according to claim 3 wherein said insert member has a cylindrical portion between said two extensions, said circumferentially arranged narrow channels being formed by a series of grooves provided in the surface of said cylindrical portion on the one part and by said wrapper portion on the other part.

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