May 27, 1958 H. C. FAY ET AL 2,836,183

CIGARETTE

Filed Nov. 19, 1954

Fig:1.

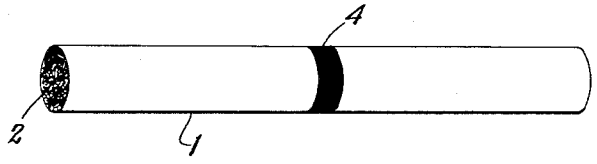


Fig:2.

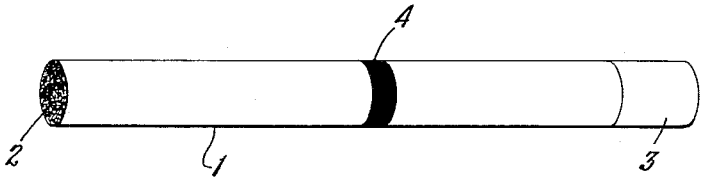


Fig:3.

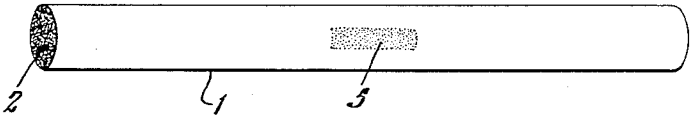


Fig:4.

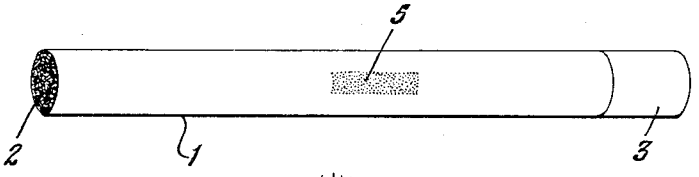


Fig:5.

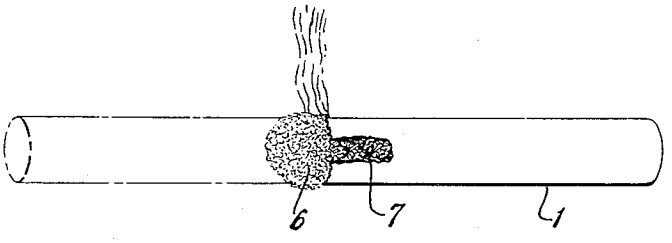
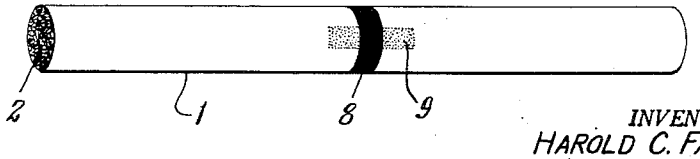


Fig:6.



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CIGARETTE

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9 Claims. (Cl. 131—4)

This invention relates to an improved cigarette.

It is a well recognized fact that tobacco smoke carries poisonous chemicals. Of these chemicals, nicotine and benzopyrene are of the greatest concern. Nicotine is an alkaloid which is so poisonous that the quantity contained in three to five cigarettes is sufficient to cause death when injected directly into the blood stream. Benzopyrene is present in the tarry resins formed by burning tobacco and is identified by some authorities as a cancer-causing agent.

Tobacco itself is a highly effective filter for the dangerous constituents contained in its smoke. As a cigarette is smoked, these constituents accumulate in the unburned portions of the tobacco, but are again suspended in the smoke upon the approach of the burning end of the cigarette. Thus, when a cigarette is smoked to near the butt end the filtering action of the tobacco is not only completely nullified, but also an excessive quantity of the harmful ingredients are caused to enter the smoker's mouth. This action is even more pronounced in the case of the so-called "king" size cigarettes, than in the case of a regular cigarette when they are smoked to the same butt length, since a greater quantity of smoke has passed through the unburned tobacco of the butt-end of the king-sized cigarette.

The ideal point at which to discontinue the smoking of a cigarette is obviously the point at which the burning end of the cigarette begins to nullify the filtering action of the unburned tobacco. The average smoker, even though he may be aware of these facts, usually finds it impossible to discipline himself to discontinue smoking a cigarette at the ideal point when he is preoccupied with work, conversation, amusements, etc.

Now, it is the object of this invention to provide a cigarette which reminds the smoker of the ideal point at which he should discontinue smoking the cigarette and thereby avoid the possibility of excess absorption of the harmful constituents of the tobacco smoke.

The cigarette, in accordance with this invention, comprises tobacco contained in a paper wrapper which carries a marker designating the optimum point to which the cigarette may be smoked without any substantial resuspension of toxic components of the tobacco smoke which have been deposited in the unburned portion of the tobacco and, therefore, without encountering excessive absorption of the harmful constituents of its smoke. The cigarette in accordance with this invention may be provided with a supplemental built-in filter or it may consist solely of tobacco contained in the paper wrapper and, thus, rely entirely upon the filtering action of the tobacco itself. The marker comprising a part of the paper wrapper which designates the optimum point to which the cigarette may be smoked may be a visual marker, an odor marker, or a marker which temporarily diminishes the draft through the burning end of the cigarette.

Having indicated the general nature of this invention, we will now proceed to a more detailed description thereof with reference to the accompanying drawing in which like reference characters are used to refer to like parts wherever they may occur. In the drawings:

Figure 1 is a perspective view of a cigarette carrying a visual, or an odor marker, or a combination of both in the form of a circumferential band,

Figure 2 is a perspective view of an alternative embodiment of our invention which is provided with a special mouth section,

Figure 3 is a perspective view of a cigarette carrying a marker which temporarily diminishes the draft through the burning end of the cigarette, a visual marker, or a combination thereof, in the form of a longitudinally extending area,

Figure 4 is a perspective view of another alternative which is provided with a special mouth section, and

Figure 5 is a perspective view of a cigarette which has been smoked to the point at which a marker which temporarily diminishes the draft through the burning end has become effective, and

Figure 6 is a perspective view of still another alternative of the cigarette in accordance with this invention.

Referring to the drawings, the numeral 1 designates generally a paper wrapper, surrounding a column of tobacco 2. The paper wrapper 1 and the column of tobacco 2 may be of any convenient length and will usually be the two and three-quarters inch length of the so-called "regular" size cigarette or the three and five-sixteenths inch length of the so-called "king" size cigarette.

Referring specifically to Figures 2 and 5, the numeral 3 designates a special mouth section of the cigarette. This mouth section may be a water-proofed section of the paper wrapper 1, or it may be a section surrounded by thin layer of cork. It may consist of a short stiff open cylinder of cardboard which prevents fragments of tobacco from getting into the mouth or it may be a section carrying a filter material, other than tobacco, such as, for example, a cellulosic material or a mineral filter material.

The circumferential area 4 of Figures 1 and 2 and the area 5 of Figures 3 and 4, respectively, are positioned with respect to the length of the cigarette at the approximate optimum point at which the smoking of the cigarette should be discontinued to avoid excessive absorption of the harmful constituents of tobacco smoke which has accumulated in the unburned tobacco of the butt end of the cigarette. The area 5 may be square or, as illustrated, rectangular with its longest dimensions positioned lengthwise of the cigarette. In the case of the cigarettes illustrated by Figures 1 and 3 which have no special mouth sections, we prefer to position the circumferential area 4 or the area 5 at the midpoint of the length of the cigarette, since either end of such cigarettes may form the butt end.

The position of the circumferential area 4 of Figure 2 and the area 5 of Figure 4 with respect to the length of the cigarette will preferably be at the exact optimum point with respect to the special mouth section 3 of the cigarette, as determined by robot smoking tests of the particular type of cigarette involved. The exact optimum position as determined by such tests depends upon the tobacco mixture forming column 2 of the cigarette and the nature of the mouth section 3. As can readily be appreciated, this optimum position will be closer to the end of the mouth section 3 when it is an efficient filter section than when it is, for example, merely a hollow end section.

The circumferential area 4 may vary in width from about one-thirty-second of an inch to about one-quarter of an inch and is preferably within the range of about one-sixteenth of an inch to about one-eighth of an inch. The area 5 is within the range of about 0.05 square inch

to about 0.10 square inch. When rectangular in form it may, for example, be from about 0.03 inch to about 0.06 inch wide and about 0.17 inch to about 0.3 inch long.

The circumferential area 4 of Figures 1 and 2 may be either a visual marker, an odor marker, or a combination of both. In the alternative in which it forms a visual marker, it is a colored area in the paper wrapper which is quite noticeable. It may, for example, be of a solid color, dotted, cross-hatched, or in the form of a design or legend. It may, for example, be green in color to emphasize the thought of a safe smoking limit or red to suggest the idea of a danger point, although it can be of any desired color.

We prefer to imprint the circumferential area 4 on the paper wrapper before the cigarette is made. We may use any of the various types of ink which are now used for printing brand names on cigarette wrappers for this purpose. The color may be provided either by a dye or a pigment.

The circumferential area 4 of Figures 1 and 2 may be an area of the paper wrapper which is impregnated or coated with a material which produces an odor noticeably different from that of the tobacco smoke when heated by the combustion of the paper wrapper in that area and of the tobacco in the immediate vicinity. This embodiment of our invention reminds a smoker that he has smoked the cigarette to the optimum point by the production of an odor distinctively different from that of the tobacco smoke when the burning end of the cigarette reaches that point.

We may use any one of a variety of different materials as our odor producer, such as, for example, a natural or synthetic rubber latex, a natural, or synthetic rubber, animal glue, casein, soy-bean protein or zein. In general, we have found that a film of about 1 to 2 mils in thickness of odor-producing solids are adequate to give a suitable odor warning. As in the case of the color marker, we prefer to deposit the odor producing solids on the wrapper 1 before the cigarette is formed.

We deposit the odor producing material on the paper in the form of a solution or suspension in a suitable volatile liquid. The latex may be applied as an aqueous suspension, while animal glue, casein, soy-bean protein, and zein may be applied as aqueous solutions. We have found, for example, that a ten percent aqueous solution of animal glue is suitable for our purpose.

The circumferential area 4 of Figures 1 and 2 may be both a visual marker and an odor marker. A portion of its width may be colored to function as a visual marker and the remainder coated with an odor producing material. Alternatively, the entire area may carry both color and an odor producing material. The odor producing material may be utilized as a vehicle for a colored pigment to form the ink to produce the combination marker.

The visual marker, the odor marker and the combined visual and odor markers do not prevent the smoker from continuing to smoke the butt of the cigarette should he choose to disregard their warning. The visual marker has no effect upon such continued smoking of the cigarette. The odor marker or the combined visual and odor marker can be disregarded by laying the cigarette aside for a few moments when the glowing end of the cigarette reaches the odor producing area to permit the small amount of odor-producing material present to burn off and then the smoking of the cigarette may be resumed.

The area 5 of Figures 3 and 4 forms a marker which reminds the smoker to discontinue smoking the cigarette by temporarily diminishing the draft through the burning end of the cigarette. This area of the wrapper 1 is impregnated or coated with a chemical compound which renders the paper in that area more inflammable than the remainder of the paper. We have found that inorganic oxidizing agents, such as, for example, sodium chlorate, potassium chlorate, sodium nitrate and potassium nitrate are suitable for this purpose and may be conveniently applied to the wrapper 1 as aqueous solutions. A solution of nitrocellulose having a reasonably high nitrogen content, for example, one of the R. S. type, in a suitable organic solvent is also suitable. This coating or impregnation of the wrapper 1 is preferably done prior to the formation of the cigarette.

The area 5 of Figures 3 and 4 may form a visual marker, as well as a marker which reminds the smoker to discontinue smoking the cigarette by temporarily diminishing the draft through the burning end of the cigarette. We produce such a marker by impregnating or coating the area 5 of the wrapper 1 both with a chemical compound which renders the paper in the area more inflammable than the remainder of the paper and with a dye or a pigmented vehicle which is non-reactive with the said chemical compound. A pigmented nitrocellulose lacquer in which the nitrocellulose is an R. S. type of relatively high nitrogen content is well suited for the production of a combination marker of this type.

The action of this marker in diminishing the draft through the burning end of the cigarette can be fully understood by reference to Figure 5 which shows a cigarette which has been smoked until the glowing end 6 of the cigarette has reached the position of the original marker area 5 (Figure 3) and caused the more highly inflammable paper in that area to burn out leaving a perforation 7 exposing tobacco which has not yet started burning. Air passes through the perforation 7 when the smoker draws on the end of the cigarette, as well as through the burning end 6 of the tobacco column, diminishing the volume of air actually passing through the burning end 6 and thereby slowing down its rate of combustion. This diminution in the rate of combustion of the tobacco, and the attendant reduction in the quantity of smoke combined with its dilution by the air entering the perforation 7 is quite noticeable to a smoker, and is an effective warning to discard the cigarette.

This warning to discard the cigarette does not, however, prevent the smoker from continuing to smoke the butt should he choose to do so, since the combustion of the tobacco continues at a reduced rate until the butt end of the perforation 7 is reached. At that point the cigarette butt again has is normal draft and can be smoked at its usual rate of combustion.

This type of marker may be combined with the visual marker or the odor marker or both. A combination of the visual marker or an odor marker or of both a visual and an odor marker is illustrated by Figure 6. Referring specifically to that figure, the area 8 is circumferential except for its interruption by the area 9. Except for its interruption by area 9, the area 8 is identical with the circumferential area 4 described hereinbefore with reference to Figures 1 and 2 and forms a visual marker or an odor marker or both. The area 9 is identical with area 5 described with reference to Figures 3 and 4 and forms a marker which diminishes the rate of combustion of the glowing end of the cigarette butt, or a combination of such a marker and a visual marker.

What we claim and desire to protect by Letters Patent is:

1. A cigarette having a paper wrapper carrying a warning marker consisting of a longitudinally extending area of the said wrapper which carries a material which renders that area of the said wrapper more inflammable than the remainder of the wrapper, the said area being positioned in an optimum zone along the length of the cigarette at which smoking of the cigarette should be discontinued to avoid any substantial resuspension of toxic components of the tobacco smoke which have been deposited in the unburned portion of the tobacco and being adapted to cause a temporary diminution in the concentration of the smoke from the cigarette when it is reached by the burning end of the cigarette by reducing the volume of air passing through the burning end and by

admitting air into the body of the cigarette behind the burning end, without extinguishing the burning end, and thereby reminding the smoker to stop smoking the cigarette without forcing him to do so.

2. A cigarette having a paper wrapper carrying a warning marker consisting of a longitudinally extending area of the said wrapper which carries a material which renders that area of the said wrapper more inflammable than the remainder of the wrapper, the said area being positioned at the midpoint in the length of the cigarette to remind the smoker to discontinue smoking the cigarette to avoid any substantial resuspension of the toxic components of the tobacco smoke which have been deposited in the unburned portion of the tobacco and being adapted to cause a temporary diminution in the concentration of the smoke from the cigarette by reducing the volume of air passing through the burning end and by admitting air into the body of the cigarette behind the burning end, when it is burned out upon being reached by the burning end, and thereby reminding the smoker to stop smoking the cigarette without forcing him to do so.

3. A cigarette having a paper wrapper carrying a warning marker consisting of an area which carries a material which renders the area more inflammable than the remainder of the wrapper, the said area extending longitudinally of the cigarette, having a circumferential width which is a minor fraction of the circumference of the cigarette, and being positioned in an optimum zone along the length of the cigarette at which the smoking of the cigarette should be discontinued to avoid any substantial resuspension of the toxic components of the tobacco smoke which have been deposited in the unburned portion of the tobacco, and being adapted to cause a temporary diminution in the concentration of the smoke from the cigarette when it is reached by the burning end of the cigarette by reducing the volume of air passing through the burning end and by admitting air into the body of the cigarette behind the burning end, when it is burned out upon being reached by the burning end, and thereby reminding the smoker to stop smoking the cigarette without forcing him to do so.

4. A cigarette having a paper wrapper carrying a warning marker consisting of an area which is different in appearance from the remainder of the wrapper and which carries a material which renders the area more inflammable than the remainder of the wrapper, the said area extending longitudinally of the cigarette, having a circumferential width which is a minor fraction of the circumference of the cigarette, and being positioned in an optimum zone along the length of the cigarette at which the smoking of the cigarette should be discontinued to avoid any substantial resuspension of the toxic components of the tobacco smoke which have been deposited in the unburned portion of the tobacco, and being adapted to cause a temporary diminution in the concentration of the smoke from the cigarette when it is reached by the burning end of the cigarette by reducing the volume of air passing through the burning end and by admitting air into the body of the cigarette behind the burning end, when it is burned out upon being reached by the burning end, and thereby reminding the smoker to stop smoking the cigarette without forcing him to do so.

5. A cigarette having a paper wrapper carrying a warning marker consisting of an area which carries an inorganic oxidizing salt which renders the area more inflammable than the remainder of the wrapper, the said area extending longitudinally of the cigarette, having a circumferential width which is a minor fraction of the circumference of the cigarette and being positioned in an optimum zone along the length of the cigarette at which the smoking of the cigarette should be discontinued to avoid any substantial resuspension of the toxic components of the tobacco smoke which have been deposited in the unburned portion of the tobacco and being adapted to cause a temporary diminution in the concentration of

the smoke from the cigarette when it is reached by the burning end of the cigarette by reducing the volume of air passing through the burning end and by admitting air into the body of the cigarette behind the burning end, when it is burned out upon being reached by the burning end, without extinguishing the burning end, and thereby reminding the smoker to stop smoking the cigarette without forcing him to do so.

6. A cigarette having a paper wrapper carrying a warning marker consisting of an area which is different in color from the remainder of the wrapper and which carries an inorganic oxidizing salt which renders the area more inflammable than the remainder of the wrapper, the said area extending longitudinally of the cigarette, having a circumferential width which is a minor fraction of the circumference of the cigarette, and being positioned in an optimum zone along the length of the cigarette at which the smoking of the cigarette should be discontinued to avoid any substantial resuspension of the toxic components of the tobacco smoke which have been deposited in the unburned portion of the tobacco, and being adapted to cause a temporary diminution in the concentration of the smoke from the cigarette when it is reached by the burning end of the cigarette by reducing the volumn of air passing through the burning end and by admitting air into the body of the cigarette behind the burning end, when it is burned out upon being reached by the burning end, without extinguishing the burning end, and thereby reminding the smoker to stop smoking the cigarette without forcing him to do so.

7. A cigarette having a paper wrapper carrying a warning marker consisting of an area which is different in color from the remainder of the wrapper and which carries an inorganic oxidizing salt which renders the area more inflammable than the remainder of the wrapper, the said area extending longitudinally of the cigarette, having a circumferential width which is a minor fraction of the circumference of the cigarette, and being positional at the longitudinal mid-point of the cigarette at which the smoking of the cigarette should be discontinued to avoid any substantial resuspension of the toxic components of the tobacco smoke which have been deposited in the unburned portion of the tobacco, and being adapted to cause a temporary diminution in the concentration of the smoke from the cigarette when it is reached by the burning end of the cigarette by reducing the volume of air passing through the burning end and by admitting air into the body of the cigarette behind the burning end, when it is burned out upon being reached by the burning end, without extinguishing the burning end, and thereby reminding the smoker to stop smoking the cigarette without forcing him to do so.

8. A cigarette having a paper wrapper carrying a warning marker consisting of an area which carries an inorganic oxidizing salt selected from the group consisting of sodium chlorate, potassium chlorate, sodium nitrate and potassium nitrate which renders the area more inflammable than the reminder of the wrapper, the said area extending longitudinally of the cigarette, having a circumferential width which is a minor fraction of the circumference of the cigarette, and being positioned in an optimum zone along the length of the cigarette at which the smoking of the cigarette should be discontinued to avoid any substantial resuspension of the toxic components of the tobacco smoke which have been deposited in the unburned portion of the tobacco, and being adapted to cause a temporary diminution in the concentration of the smoke from the cigarette when it is reached by the burning end of the cigarette by reducing the volume of air passing through the burning end and by admitting air into the body of the cigarette behind the burning end, without extinguishing the burning end, and thereby reminding the smoker to stop smoking the cigarette without forcing him to do so.

9. A cigarette having a paper wrapper carrying a

warning marker consisting of an area which is different in color from the remainder of the wrapper and which carries an inorganic oxidizing salt selected from the group consisting of sodium chlorate, potassium chlorate, sodium nitrate and potassium nitrate which renders the area more inflammable than the remainder of the wrapper, the said area extending longitudinally of the cigarette, having a circumferential width which is a minor fraction of the circumference of the cigarette, and being positional at the longitudinal mid-point of the cigarette at which the smoking of the cigarette should be discontinued to avoid any substantial resuspension of the toxic components of the tobacco smoke which have been deposited in the unburned portion of the tobacco, and being adapted to cause a temporary diminution in the concentration of the smoke from the cigarette when it is reached by the burning end of the cigarette by reducing the volume of air passing through the burning end and by admitting air into the body of the cigarette behind the burning end, when it is burned out upon being reached by the burning end, without extinguishing the burning end, and thereby reminding the smoker to stop smoking the cigarette without forcing him to do so.

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