United States Patent [19]

Morgenstern

[11] **3,847,161**

[45] **Nov. 12, 1974**

[54] **FILTERED CIGARETTES**

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[22] Filed: **Apr. 20, 1973**

[21] Appl. No.: **353,105**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 267,975, June 30, 1972, Pat. No. 3,756,250.

[52] **U.S. Cl.**..... **131/10.3,** 131/10.5, 131/10.7, 131/15 B, 131/198 R

[51] **Int. Cl.**..... **A24d 01/04**

[58] **Field of Search**..... 131/9, 10 R, 10 A, 10.3, 131/10.5, 10.7, 15 B, 198 R, 198 A, 207

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[57] **ABSTRACT**

A filtered cigarette in which the upstream end of the tobacco smoke filter is disposed along a single inclined plane so that there is a variable drawing resistance along different longitudinal planes of the filter and a progressive build-up of tars and nicotine on the inclined plane and in which the space between the tobacco and the upstream end of the filter provides a chamber in which the tobacco smoke may be cooled by air inhaled through apertures in the cigarette wrapper. Additionally, there is a relatively even draw resistance throughout the entire smoking cycle.

8 Claims, 15 Drawing Figures

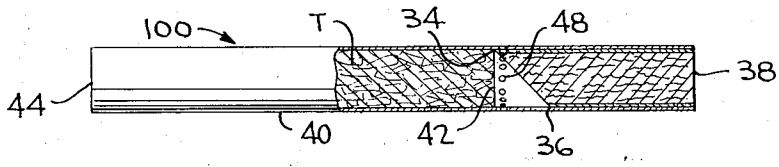


FIG. 1

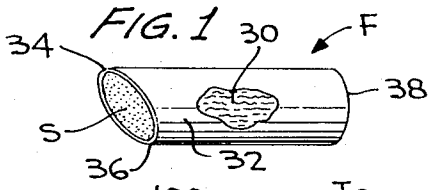


FIG. 3

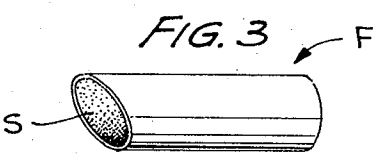


FIG. 2

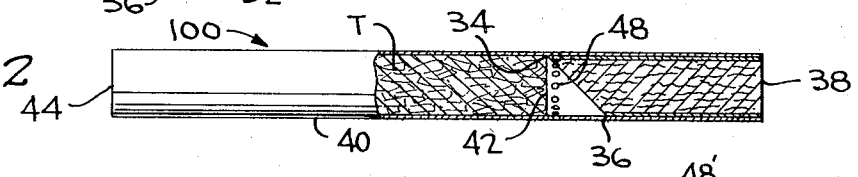


FIG. 4

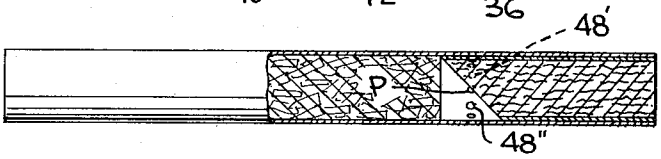


FIG. 5

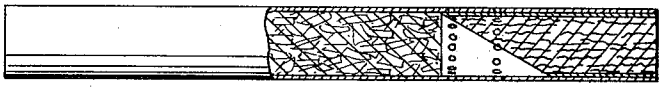


FIG. 6



FIG. 7

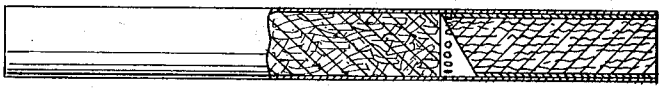


FIG. 8

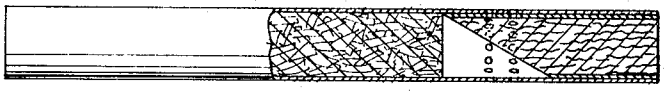


FIG. 12

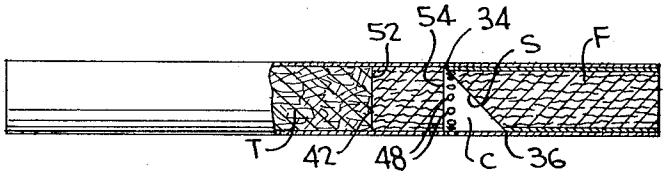


FIG. 13

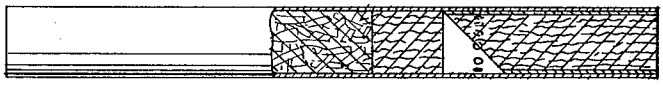


FIG. 14

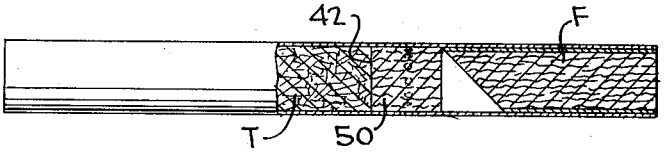


FIG. 15



FIG. 9

PRIOR ART

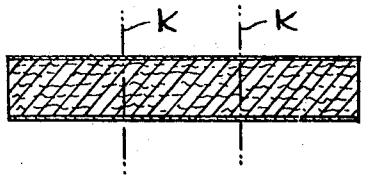


FIG. 10

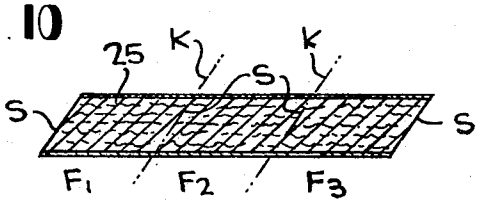
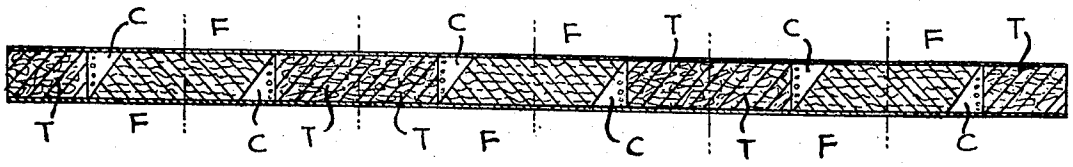


FIG. 11



FILTERED CIGARETTES

This application is a continuation-in-part of U.S. application Ser. No. 267,975 filed June 30, 1972 now U.S. Pat. No. 3,756,250.

BACKGROUND OF THE INVENTION

This invention relates to filtered cigarettes and filters therefor and, particularly, to filters allowing air mixing in such filtered cigarettes.

The increasing death rate resulting from vascular disorders, lung cancer and cancer of the upper respiratory tract is known to both the medical profession and the general public. While to some extent, it is unquestionable that this increase is due in part to the overall environmental conditions caused by a highly advanced technological society, the results of recent scientific investigation together with statistical evidence have shown that lung cancer and vascular disorders are casually related to tobacco smoking. It is widely recognized that the cancer-causing agents or carcinogens may be present in the tobacco tar and nicotine from burning tobacco and that they are carried to the smoker's respiratory tract in the tobacco smoke.

Many previous attempts have been made to protect smokers against the health hazards of smoking, including a variety of mechanical and chemical means for incorporation into cigarettes, cigarette and cigar holders, tobacco pipes and the like with a view to extracting from the tobacco smoke, at least, a proportion of the harmful substances.

However, most of the previous attempts have failed to take into account two important factors, namely, firstly, that tobacco smoke is at a high temperature by virtue of the combustion temperature (viz. 800°C or more) of the tobacco, and any enveloping material, e.g., cigarette paper (often impregnated with chemical products to sustain burning) and, secondly, that the tobacco smoke is low in oxygen, most of the oxygen of the air used in the combustion having been converted to carbon monoxide and carbon dioxide. It is apparent that the high temperature and the low oxygen content of the tobacco smoke entering the mouth, respiratory tract and lungs of a smoker enhance the dangers of or, indeed, cause the observed deleterious effect of tobacco smoke. Even those prior art filtering devices which did combine cooling of the tobacco smoke by air mixing with filtration did not provide the ease of manufacture and economy of the filtering device of the present invention.

In the machines presently used in the production of filtered cigarettes, 1,200 to 2,000 cigarettes are produced each minute, and the expectation is that this rate can be increased to 4,000 cigarettes per minute. The filter material fed into the machine is of a length calculated to provide four or six cigarettes in one operation; the older machines making four and the newer six. In either case, whether four or six cigarettes are produced in each operation, the process of production is the same.

SUMMARY OF THE INVENTION

The filtering device of the present invention overcomes the above objections and difficulties by providing a filtering device having a flow restricting orifice which gives a relatively even mixture of air and smoke throughout the entire smoking cycle, without requiring any manipulation of the filtering device or of the cigarette by the smoker. In fact, it is a distinct advantage of the filtering device of the present invention that a cigarette may be produced using conventional cigarette manufacturing equipment without any significant modifications and at no additional cost to that of a regular filter cigarette, and without affecting the rate of production.

According to one aspect of the present invention, there is provided a cigarette having a tobacco smoke section of generally cylindrical configuration having an upstream end (to be ignited during the smoking cycle) and a downstream end; and a tobacco smoke filter in flow communication with the tobacco section. The tobacco smoke filter has an upstream end and a mouthpiece end. The upstream end of the filter carries a single inclined plane which presents a surface having a cross-sectional area which gradually increases from a first point on the circumference of the filter at one extreme end thereof (the end opposite the mouthpiece end) to a maximum area at a second point on the circumference approximately 180° displaced from the first point; that is, the first point is at the forwardmost portion of the filter closest to the tobacco and the second point is at the rearmost portion which is significantly displaced from the forwardmost portion. A wrapper connects the tobacco smoke filter and the tobacco section and defines a mixing chamber disposed between the tobacco section and the tobacco smoke filter. The single inclined plane provides a variable drawing resistance along different longitudinal planes of the filter so that smoke is constrained to flow first through the plane of least drawing resistance (the plane of shortest length from the mouthpiece end to the upstream end) and then, as the shortest plane becomes saturated with tar and nicotine, progressively through planes of increasing drawn desistance, i.e., planes of increasing longitudinal length.

Viewed from another aspect, the invention provides a cigarette incorporating one or more apertures in the cigarette wrapper so disposed and formed that, when the smoking means are being used, suction by the smoker in the usual way causes supplementary air, that is air that has not passed through the burning portion of the tobacco being smoked to be drawn through the apertures into an air mixing chamber where the supplemental air mixes with tobacco smoke and through a tobacco smoke filter into the mouth of the smoker simultaneously with the tobacco smoke, such supplementary air serving both to lower the temperature of the tobacco smoke and to enrich it with oxygen. The tobacco smoke filter has a varying drawing resistance provided by a single inclined plane carried on its upstream end. Alternatively, an air permeable wrapper might be used, supplementary air being drawn into the air mixing chamber through the pores of the wrapper; that is, apertures include any openings in the cigarette wrapper whether manually made as by puncturing or existing by virtue of the pores in air permeable wrapper material.

According to another aspect of the present invention, an additional one or more apertures in the cigarette wrapper are so disposed and formed so as to be in flow communication with the upstream end of the tobacco smoke filter, i.e., that end which carries the single inclined plane so that as the tars and nicotine build up on the inclined plane and reduce the amount of supple-

mentary air being drawn into the air mixing chamber, the amount of supplementary air inhaled through the additional one or more apertures through the filter remains constant and thereby assures a substantially perfect ratio of air-to-smoke during the entire smoking cycle.

According to still another aspect of the present invention, a second tobacco smoke filter of cylindrical configuration and preferably, although not necessarily, of shorter length than the primary filter, is disposed between the downstream end of the tobacco section and the forwardmost portion of the upstream end of the primary tobacco smoke filter; i.e., the air mixing chamber is between the two filters. The filters can be formed from the same or different materials, but each is preferably of substantially uniform density. The apertures in this case may be placed in communication with the second filter, air mixing chamber, or both and also partially with the upstream end of the primary tobacco smoke filter. The term "primary" in this respect is only intended to distinguish the tobacco smoke filter carrying the inclined plane from the additional cylindrical filter element and is not intended to denote any degree of efficiency of filtering action.

Conveniently, the varying drawing resistance is provided by having a filter of substantially uniform density, but having a forwardmost portion, that is, the end furthest from the smoker's mouth and closest to the tobacco end, of reduced cross-section, as compared to the rest of the filter. That is, the upstream end carries a single inclined plane having a forwardmost portion and a rearmost portion which is significantly displaced from the forwardmost portion at a point approximately 180° from the forwardmost portion. The filter is disposed in the filtered cigarette with the forwardmost portion directed towards the tobacco section and the rearmost portion directed to the mouthpiece end.

In the production of the filtered cigarettes of the present invention, an elongated filter is cut into two or three sections with one or two knives respectively; the knife or knives are slanted with respect to the longitudinal axis of the elongated filter to provide the single inclined plane. Each of these cut filter sections are inserted into the cigarette wrapping machine between tobacco sections and is then further cut to produce either four or six cigarettes in each cycle of production.

It is, therefore, an object of the present invention to provide a filtered cigarette which will serve to reduce or minimize the dangers arising from smoking tobacco and other combustible materials and which does not necessitate to any noticeable extent, a change in the appearance and size of conventional cigarettes, the filtered cigarette being satisfactory from an operative and economical aspect.

It is a further object of the present invention to provide in a filtered cigarette, for the purpose of reducing or minimizing the dangers inherent in smoking, an air mixing chamber for lowering the temperature of the tobacco smoke and to enrich it with oxygen and a flow restrictive filter which does not require any effort on the part of the smoker to achieve the flow restricting properties of the filter and which will ensure a relatively even mixture of tobacco smoke and supplemental air throughout the smoking cycle.

It is still a further object of the present invention to provide smoking means comprising a cigarette having an air mixing chamber in which smoke from the burning portion of the tobacco is mixed with supplemental air drawn into the air mixing chamber through one or more apertures and a flow restrictive filter carrying on its upstream end, that is, the end furthest from the smoker's mouth and closest to the tobacco section, a single plane inclined with respect to the path of flow of the tobacco smoke.

It is still a further object of the present invention to provide in a cigarette a conventional cylindrical tobacco smoke filter of uniform density carrying on its upstream end a single plane inclined with respect to the longitudinal axis of the filter, such inclined plane of the filter defining, along with the tobacco portion and the connecting wrapper of the cigarette, an air mixing chamber in which tobacco smoke and supplemental air are mixed prior to impinging on the inclined plane on the upstream end of the filter, the supplemental air being drawn into such air mixing chamber through one or more apertures provided in the connecting wrapper, each aperture being in substantial flow communication between the air mixing chamber and outside atmosphere either directly or through a supplemental filter or alternatively through an air permeable connecting wrapper. Additionally, it is still a further object to provide an additional one or more apertures in the connecting wrapper to provide for direct flow communication between the upstream end of the tobacco smoke filter and the outside atmosphere whereby a still more nearly perfect ratio of air-to-smoke will be achieved throughout the entire smoking cycle.

Still other objects of the present invention will become apparent in connection with the following descriptions and appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** shows a schematic elevational view of the tobacco smoke filter according to the present invention with parts broken away and shown in section.

FIG. **2** shows a schematic elevational view of a filtered cigarette according to the present invention with parts broken away and shown in section.

FIG. **3** shows a schematic elevational view of a tobacco smoke filter according to the present invention showing the progressive build-up of solid particulate matter on the inclined plane of the filter.

FIGS. **4–8** is a view similar to FIG. **2**, of various other embodiments of the filtered cigarette of the present invention.

FIG. **9** is a sectional view of a filter element used in prior art filter-cigarette making machine.

FIG. **10** is a sectional view of a filter made according present invention, for use in conventional filter-cigarette making machines.

FIG. **11** is a sectional view showing one way in which plural filters and cigarette elements may be assembled during filter-cigarette manufacture.

FIGS. **12–15** are views similar to FIG. **2** of additional embodiments of the present invention in which an additional filter element is used.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now the the drawings, FIG. **1** shows a tobacco smoke filter F according to the present invention. The filter is constructed using any conventional cigarette filter material **30** and has a relatively uniform density throughout its length. The filter may be cut

from cylindrical stock and may be provided with a wrapper **32.** More typically, however, in most commercial operations, the filter will not have its own wrapper. Where an additional wrapper is desired, it will often be located on the outside of the cigarette wrapper. In any event, for the purposes of the present invention, if an optional wrapper **32** is used, it will be air permeable, either because of the porosity of the wrapper material or because it has been provided with apertures, e.g., holes or vents, in alignment with the apertures in the cigarette wrapper. The upstream end of the filter, to the left in FIG. **1,** carries an inclined plane denoted generally at S, and is inclined from the forwardmost point **34** located on the outer surface of the filter and extremely opposite the mouthpiece end **38** and extending to the rearmost point **36** which is significantly displaced from and approximately 180° about the circumference from the forwardmost point **34.** This inclined plane can be conveniently formed by slicing or cutting a cylindrical filter element at an angle (to be defined) to the longitudinal axis of the filter element. The mouthpiece end **38** of the tobacco smoke filter F is formed perpendicular to the longitudinal axis of the cigarette and filter which is, of course, essentially parallel to the path of the cirgarette smoke through the cigarette. The cross-sectional area of the tobacco smoke filter, looking from left to right in the direction of the longitudinal axis, is seen to gradually increase along planes perpendicular to the longitudinal axis from the forwardmost point **34** to the rearmost point **36.**

The cigarette shown in FIG. **2** has a wrapper **40** containing tobacco T of cylindrical configuration and filter F, the filter carrying an inclined plane S of about 45° measured with respect to a plane perpendicular to the longitudinal axis of the filter on the upstream end, the forwardmost portion of which abuts the downstream end **42** of the tobacco section T, forming air mixing chamber C (FIG. **12**) disposed between tobacco T, filter F and wrapper **40.** Apertures **48** in the form of radial holes are so located in the cigarette wrapper **40** as to place the air mixing chamber in flow communication with the outside atmosphere, the apertures being provided, for example, by piercing the wrapper either before or after assembly of cigarette **100.** Instead of, or in addition to, providing vents, e.g., holes, in the cigarette wrapper, it is also possible to use a porous cigarette paper through which supplemental air may be drawn into the air mixing chamber. The cigarette is ignited at its upstream end **44** containing tobacco T and the smoker inhales at the mouthpiece end **38** through tobacco smoke filter F.

During the process of smoking the cigarette thus described, as the smoker draws on the cigarette, smoke is drawn from the point of combustion at the upstream end **44** along the tobacco T directly into the air mixing chamber C while simultaneously supplementary air is drawn through one or all of the apertures into air mixing chamber C where the smoke and supplementary or fresh air are mixed prior to impinging on inclined plane S of filter F.

The suction required to draw air through the tobacco from the point of combustion at **44** to the downstream end of the tobacco **42** depends on the resistance provided by the tobacco which, in turn, for a given cross-sectional area and tobacco density, depends on the length of tobacco through which the air is to be drawn. Similarly, the drawing resistance of the tobacco smoke filter F is also dependent on the length of the filter and, consequently, the force of suction will be strongest (i.e., least draw resistance) at the shortest longitudinal plane through the rearmost portion **36** of the filter F. Therefore, during the process of smoking the smoke and air in air mixing chamber C will initially be constrained to flow toward the rearmost portion **36** of the tobacco smoke filter F. This narrow end acts as a flow restricting orifice, bringing about a mixture of smoke with air, intensified filtering and a desireable ratio of smoke to air. As the smoking process continues, the rearmost portion **36** becomes congested with tars and the flow of air and smoke will proceed, step-by-step, along the inclined plane S toward the longest longitudinal plane through the forwardmost portion **34.** The progressive build-up of the solid particulate matter along successive planes of increasing draw resistance is illustrated in FIG. **3** wherein the darkest shaded region on the inclined plane S indicates the heaviest build-up of solid particulate matter and the lightest shading indicating the least build-up. The increased draw resistance through the filter as the build-up of tars and nicotine continues is offset since the length of tobacco will have decreased, thereby decreasing its draw resistance and thereby assuring a relatively even draw resistance through the smoking cycle. It should be noted, however, that the drawings resistance of the tobacco section T decreases relatively rapidly and, therefore, to maintain a proper balance of smoke and supplemental air during the smoking cycle, the flow of supplemental air through the filter F must not decrease as rapidly. This will, to some extent, result naturally, since the congested filter will present a greater barrier to the smoke, which is loaded with tars and nicotine, than to the supplemental air which is much thinner. In fact, it is advantageous to select the angle of the inclined plane and the location and total area of the apertures so that the total amount of supplemental air mixed with the tobacco smoke does not diminish significantly during the entire smoking cycle. This is so because as the length of the tobacco section decreases, the tobacco smoke has a shorter distance to travel to the air mixing chamber and, consequently, enters the chamber at a proportionally higher temperature, there having been less time for heat transfer through the tobacco section. Therefore, it is preferable to add as much supplemental air as possible to this hotter smoke. It is, thus, readily apparent that by proper selection of the angle or surface area of the inclined plane S of tobacco smoke filter F, the increased draw resistance through the tobacco smoke filter will be compensated for by the decreased draw resistance of the tobacco section, thereby ensuring a satisfactory mixture of smoke and fresh air in the mixing chamber and a draw resistance which will remain relatively constant through the smoking cycle.

More specifically, with regard to the angle of the inclined plane S, measured with respect to a plane perpendicular to the longitudinal axis of the cigarette, e.g., the downstream end **42** of the tobacco smoke section, it has been found that any angle within the range of about 20° to about 70° is suitable, although angles within the range of about 30° to about 60° are preferred and a range of about 40° to about 55° is most preferred. Any angle much less than 20° will not present sufficient surface area on the inclined plane or enough variation in draw resistance while any angle much more than 70° will make the cigarette structurally weak since there

will be a relatively large proportion of unsupported cigarette wrapper in the area of the mixing chamber.

Referring now to FIGS. **10** and **11**, the steps for producing filtered cigarettes according to the present invention (using a six cigarette per cycle cigarette wrapping machine) are shown. FIG. **9** shows conventional cylindrical filters formed from cigarette filter material **30** having a relatively uniform density throughout their length cut into three sections. FIG. **10** shows the method of formation of the preferred embodiment of the filters of the present invention, forming three sections of filter material, **F1, F2, F3** using tilted cuttng edges K. Each of the sections **F1, F2, F3** services two cigarettes as shown in FIG. **11.**

FIG. **11** shows the filter sections **F1, F2** and **F3** of FIG. **10** disposed between tobacco sections T ready to be cut into six cigarettes each having a mixing chamber C. It is thus readily apparent that (according to the present invention), the production of filtered cigarettes having a tobacco section T, an air mixing chamber C and a tobacco smoke filter F having an inclined upstream plane S may be accomplished without making any significant changes of equipment and without impairing the speed of production of filter cigarette wrapping machines.

The desired angle of the slanted surface is obtained by merely tilting the cutting edge K to the desired angle, i.e., between about 20° and about 70°. Regardless of the angle selected, it is readily apparent that there is no waste material, each of sections **F1, F2** and **F3** being identical.

The embodiment shown in FIG. **4** is similar to that shown in FIG. **2** with the exception that the upper set of apertures **48'** is placed to provide flow communication between the outside atmosphere and the upstream end of the tobacco smoke filter in order to draw supplemental air directly into the smoke filter, i.e., the apertures **48'** are covered by the circumferential surface of the upstream end; the lower set of apertures **48''** is so located as to place the air mixing chamber C in flow communication with the outside atmosphere and thus performs the identical function as the apertures **48** of FIG. **2.** It is obvious, of course, that the function of the apertures **48''**, i.e., to allow supplemental air to be drawn into the mixing chamber C, is relatively independent of their relative position between the point **34** and the point **36**; the tobacco smoke will still be cooled in the mixing chamber and the cooled smoke will still impinge the inclined plane of least resistance. Therefore, it is apparent that the location of the apertures **48''** may be anywhere along the cigarette wrapper circumference between points **34** and **36,** independently of the location of the apertures **48'**. Of course, the placement (and the total area) of the apertures **48''** should be such that a satisfactory quantity of supplemental air will be inhaled for the particular tobacco and filter selected.

Similarly, the relative location of the apertures **48'** is not critical; the selection of the number, total area, and position of the apertures should be selected to accomplish the desired result, namely, provide for a relatively constant supply of supplemental air throughout the entire smoking cycle. For ease of manufacture, the apertures **48''** and the apertures **48'** should be formed in a single series of circumferentially placed vents as shown in FIG. **4** or a multiple series as shown in FIG. **5** in which an angle of about 60° for the inclined plane is shown. It has also been found that for best results of mixing, even draw and ease of manufacture the vents are located between about **1**mm to the right of the forwardmost portion **34** and about **1**mm to the left of the rearmost portion **36** or preferably a distance from the forwardmost point **34** which is less than four-fifths of the total distance between the forwardmost point **34** and the rearmost point **36** of the tobacco smoke filter. With the vents located any closer to the rearmost portion **36,** it becomes difficult to provide enough aperture area to allow sufficient cooling of the tobacco smoke in the mixing chamber. Most preferably, the vents, whether formed in a single or multiple ring, should be less than about three-fifths of the total distance between the forwardmost and rearmost points on the inclined plane.

The advantage of using apertures in communication with the mixing chamber and other apertures in communication with the upstream end of the tobacco smoke filter is that as the tars and nicotine deposited on inclined plane S move towards the crossing point P and the amount of supplemental air drawn through the apertures **48''** decreases because of the increased resistance of the filter, the air being drawn through the covered apertures **48'** will not be subject to the influence of the progressive deposit of tars and nicotine and a steady, continuous flow will result. The intake of air through the covered apertures **48'** will remain constant throughout the smoking cycle and will create a near perfect ratio of smoke to air during the entire smoking cycle.

Nevertheless, since it is most desirable to have the maximum amount of supplemental air mix with the tobacco smoke in the mixing chamber to provide the maximum amount of cooling (supplemental air inhaled through the covered apertures flow through the filter relatively close to the surface and does not mix with the smoke prior to entering the smoker's mouth) the apertures can be arranged for example, as shown in FIG. **5.** The cigarette can also be manufactured with a single aperture **48** as shown in FIG. **6** (in which a 45° angle is shown).

FIGS. **7** and **8** each illustrate a slight variation in the location of the circumferential series of vents and the angle of the inclined plane, FIG. **7** showing a single ring slightly displaced to the right of the forwardmost portion for a 30° angle and FIG. **8** showing a double ring about midway between the forwardmost and rearmost portions of the inclined plane which is shown for a 60° angle, at least, one of the rings preferably being located less than three-fifths the total distance between the forwardmost and rearmost portions.

FIGS. **12–15** show modified embodiments of the filtered cigarette of the present invention in which a cylindrical additional filter element **50** is inserted between the downstream end **42** of tobacco section T and tobacco smoke filter F to provide additional filtering action without modifying the principle upon which the filter F operates, namely, progressive build-up of tars and nicotine from the plane of least resistance to the plane of greatest resistance. The upstream end **52** of the filter element **50** abuts the downstream end **42** of tobacco smoke section T while downstream end **54** of filter element **50** abuts the forwardmost portion **34** of the upstream end of filter F. The filtering material of filter element **50** can be the same or different than the material of filter F. The location and area of apertures

48 and the angle of the inclined plane S are a matter of choice and convenience, the several configurations shown in FIGS. 12–15 being merely exemplary.

The foregoing description is considered as only illustrative of the principles of this invention. Other modifications and changes will be apparent to those skilled in the art and therefore, the present invention cannot be limited to the exact constructions and operations as shown and described and, accordingly, many modifications and equivalents are commensurate with the scope of this invention as claimed.

What is claimed is:

1. A filtered cigarette comprising:

a. a tobacco section of cylindrical configuration having an upstream end and a downstream end;

b. a tobacco smoke filter having an upstream forward end and a cylindrical mouthpiece rear end; and

c. a wrapper encircling said tobacco section and said filter and having means providing at least one aperture therethrough;

said upstream end of said filter being disposed along a single plane inclined with respect to the longitudinal axis of the cigarette,

the forwardmost portion of said inclined plane being adjacent the downstream end of said tobacco smoke section and rearmost portion of said inclined plane being significantly displaced from said forwardmost portion at a point approximately 180° from said forwardmost portion;

said inclined plane making an angle of about 20° to about 70° measured with respect to a plane perpendicular to the longitudinal axis of the cigarette;

said downstream end portion, said inclined plane, and said wrapper forming an air mixing chamber;

said at least one aperture means being substantially in flow communication between said air mixing chamber and the outside atmosphere.

2. The filtered cigarette of claim 1 wherein said, at least, one aperture is in the form of a vent and there are a plurality of said vents in direct communication with said upstream end and said outside atmosphere and also a plurality of said vents in communication with said air mixing chamber and said outside atmosphere.

3. The filtered cigarette of claim 2 wherein said vents are circumferentially formed in, at least, a single series extending through 360° about said wrapper and are located from said downstream end less than four-fifths the total distance between said forwardmost portion and said rearmost portion.

4. The filtered cigarette of claim 3 wherein there are, at least, two of said series of vents, at least one of which is located from said downstream end less than three-fifths the total distance between said forwardmost portion and said rearmost portion.

5. The filtered cigarette of claim 1 wherein said inclined plane makes an angle of about 30° to about 60° measured with respect to a plane perpendicular to said longitudinal axis.

6. The filtered cigarette of claim 1 wherein said inclined plane makes an angle of about 40° to about 55° measured with respect to a plane perpendicular to said longitudinal axis.

7. The filtered cigarette of claim 1 wherein a cylindrical additional filter element is disposed between said downstream end of said tobacco section and said forwardmost point of said upstream end of said tobacco smoke filter.

8. The filtered cigarette of claim 7 wherein said wrapper has at least one aperture which is in communication between said outside atmosphere and said cylindrical additional filter element.

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