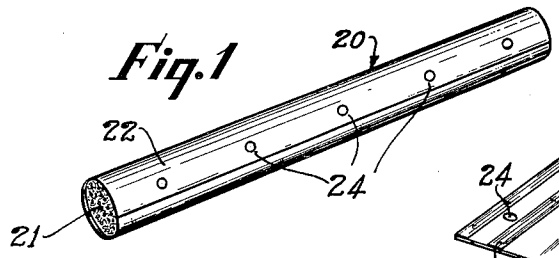
Oct. 9, 1962 E. P. BUGGE 3,057,360

CIGARETTE CONSTRUCTION

Filed Aug. 4, 1959

Fig. 1



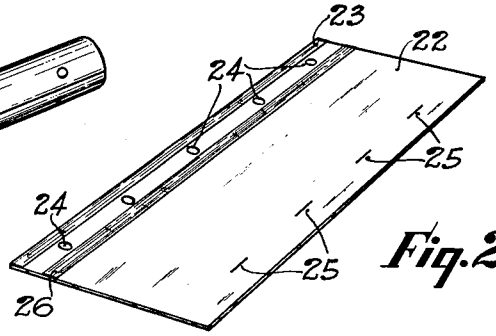
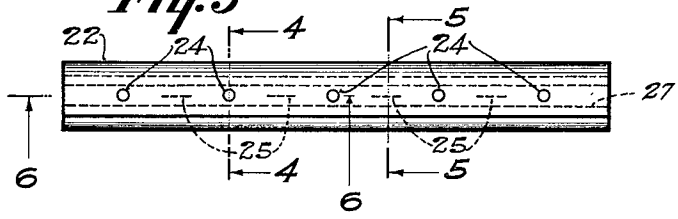


Fig. 2

Fig. 3



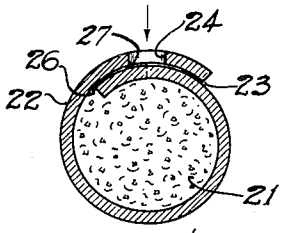


Fig. 4

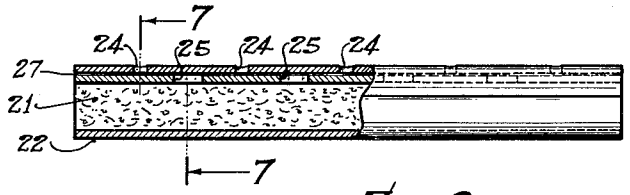


Fig. 6

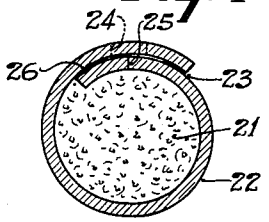


Fig. 5

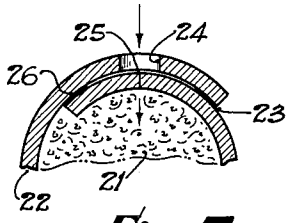


Fig. 7

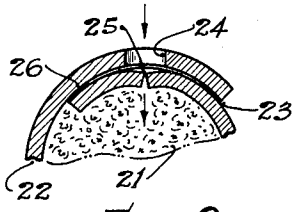


Fig. 8

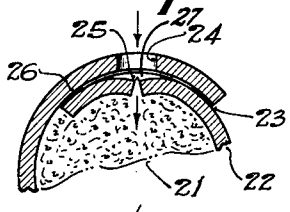


Fig. 9

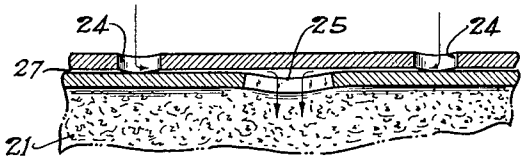


Fig. 10

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CIGARETTE CONSTRUCTION

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3 Claims. (Cl. 131—9)

This invention relates generally to cigarettes, and more particularly to an improved type of cigarette having means for the admission of air into the stream of smoke.

It has long been recognized that the smoke from a cigarette contains many products of incomplete combustion, and these do not add to the enjoyment of the cigarette, but may instead have injurious effects upon the smoker. It has been the custom for many years to add potassium chlorate or some other comparable material to the tobacco used in cigarettes, and while this has been added primarily for the purpose of ensuring the continuous burning of the cigarette, it has also added to the completeness of the combustion of the various products. However, it will be appreciated that any such chemical adds its own end products, and even with the added oxygen, there is no assurance that combustion has been complete.

More recently, efforts have been made to provide a paper for cigarettes which has a controlled porosity, thus permitting the admission of air into the cigarette between the burning end and the smoker's mouth. However, to secure the desired porosity is in itself a problem of some magnitude, and to this must be added the problem of providing a paper having a sufficient mechanical strength to withstand the physical handling to which cigarettes are subjected. Thus, while the addition of air to the smoke from a cigarette is desirable, it has heretofore been difficult to accomplish this within the cigarette itself.

It is a major object of the present invention to provide a cigarette construction adapted to provide for the addition of air to the smoke of a cigarette.

Another object of the invention is to provide a form of construction in which the amount of air that is added to the smoke screen varies with the degree of suction exerted by the smoker.

It is a further object of the invention to provide a cigarette having the means for adding air to the stream of smoke, which cigarette is constructed of standard, presently used materials, and does not require the use of special paper, treatment of the tobacco, or auxiliary equipment.

Still another object of the invention is to provide a cigarette construction that can be accomplished with existing and presently used machinery, with slight and inexpensive modification, so that present manufacturing procedures may be continued.

It is a still further object of the invention to provide a cigarette construction which provides an improved cigarette, having improved smoking characteristics, at substantially no increase in cost to the manufacturer.

These and other objects and advantages of the invention will become apparent from the following description of a preferred form thereof, and from the drawings illustrating that form in which

FIGURE 1 is a perspective view of a cigarette constructed in accordance with the present invention;

FIGURE 2 is a perspective view of a sheet of cigarette paper of the type used in the present invention;

FIGURE 3 is a side elevational view of a cigarette incorporating the present invention;

FIGURE 4 is a cross-sectional view taken through one of the ports or apertures, and taken on the line 4—4 of FIGURE 3;

FIGURE 5 is a cross-sectional view of the cigarette shown in FIGURE 3, taken upon the line 5—5 thereof and showing the valve construction;

FIGURE 6 is a longitudinal view, partially broken away, and taken perpendicular to the view in FIGURE 3;

FIGURE 7 is a cross-sectional view taken on the line 7—7 of FIGURE 6 and showing both the port and valve in normal, unstressed position;

FIGURE 8 is a view similar to FIGURE 7 but showing the action of the valve when subjected to mild suction;

FIGURE 9 is a view similar to FIGURE 7 but showing the action of the valve under greater suction; and

FIGURE 10 is an enlarged fragmentary view taken along the longitudinal axis of the cigarette and showing the action of the valves when the smoker is sucking or drawing on the cigarette.

Referring now to the drawings and particularly to FIGURE 1 thereof, the numeral **20** indicates generally a cigarette constructed in accordance with the present invention and including a core or cylinder **21** of shredded tobacco, enclosed in a paper tube **22**. If desired, the cigarette **20** may be provided with a lip-engaging tip (not shown) of any suitable material, such as cork, etc., and likewise, a so-called filter tip may be affixed to the cigarette **20** if desired. However, neither the use of the special lip-engaging tip material, nor the filter tip is necessary, though either or both may be used without affecting the construction and operation of the present invention.

In the manufacture of cigarettes, the longitudinally extending edges of the paper **22** are overlapped as shown in FIGURES 3, 5 and 6, to form a cylinder, the edges of the paper being held in overlying position by a suitable adhesive. Heretofore, substantially the entire overlying area has been coated with adhesive, but in accordance with the present invention, only a portion of this area is so coated. A portion of the overlying area may thus be termed the nonadhering area, and in this latter area are a plurality of valves suitably arranged to admit air into the interior of the cigarette.

As thus seen in FIGURE 2, the extreme longitudinal edge of the outer overlying section is provided with an adhesive strip or band **23** and adjacent this strip is a plurality of longitudinally spaced holes or ports **24** that extend completely through the paper **22**.

Along the opposite edge of the paper **22** is a series of slits **25** spaced from the edge of the paper so as to be circumferentially aligned with the ports **24** when the paper **22** is rolled into the cylinder that is eventually formed. However, the slits **25** are preferably spaced so that they are not longitudinally aligned with the ports **24**, but fall intermediate these ports, as indicated in FIGURES 3, 6, and 10. Finally, another strip of adhesive **26** may be applied along the edge of the paper **22**, inwardly from and adjacent the holes or ports **24**. In this manner, a longitudinally extending passageway **27** is provided, this passageway interconnecting the ports **24** and the slits or valves **25**, and at least one edge of the passageway being sealed by adhesive. Generally it is desirable to seal both sides or edges of the passageway **27**, as by the adhesive strips **23** and **26**, but if one adhesive strip is to be omitted, it is generally preferable to omit the inner one **26**, since the opposite edge of the paper **22** will normally be held in position by the presence of the tobacco **21**.

The slits or valves **25** are formed by cutting or severing the paper with a very sharp knife edge so that none of the paper is actually removed, and the adjacent edges of the slit bear against each other, as indicated in FIGURE 5. It will be appreciated that the thickness of the paper **22** is greatly exaggerated in the figures so that the construction and operation of the invention will be more clearly understood. Cigarette paper, of course, is very thin, and the ribbon of adhesive likewise usually has no appreciable thickness, as distinguished from the showing of these features in the drawings.

In the normal use of a cigarette constructed in accordance with the present invention, when the cigarette is burning normally without any air being drawn through it, burning proceeds in the normal manner, and the valves **25** remain closed, as indicated in FIGURE 7. In this figure it will be seen that the adjacent surfaces of the paper, by reason of the natural resilience of the paper and by reason of the curving of the paper and the forming of a cylinder, bear against each other and present no opening for the admission of air into the side of the cigarette, through the valves **25**.

When the smoker takes a puff upon the cigarette, he produces a suction that draws air through the cigarette from the burning end and in general reduces the pressure within the cigarette. The drawing of air through the burning end of the cigarette ensures that the smoke produced by burning will travel through the cigarette and into the smoker's mouth, as is customary, and the reduced pressure within the cigarette causes air to enter through the ports **24**, follow along the longitudinally extending passageway **27** connecting the ports and valves **25**, and to then enter through the valves **25** into the cigarette. The admission of air through the valves **25** is made possible by the flexibility of the paper **22**, which, by reason of the reduced pressure within the cigarette, is slightly collapsed from its normal cylindrical form so that the area adjacent the slots or valves **25** is bowed inwardly, thus spreading the innermost edges of the slits and permitting the passage of air, as indicated in FIGURE 8. The passage of air along the passageway **27** is illustrated in FIGURE 10.

When the smoker puffs harder, and creates a greater vacuum or reduction of pressure within the cigarette **20**, the valves **25** will be opened farther by the greater distortion of the edge of the paper, as illustrated in FIGURE 9, so that a greater quantity of air is admitted into the cigarette. In this way, the harder the smoker draws on the cigarette, or expressed differently, the greater the suction within the cigarette, the greater the amount of air that is admitted through the valves **25**.

Because the bending and natural resilience of the paper **22** closes the valves **25**, it will be recognized that the construction of the valves in the presently described manner is of some considerable importance. Thus, the preloading that is applied to the valves **25** is important, and furthermore is automatically provided by the present form of construction. If the slits or valves **25**, instead of extending longitudinally, extended generally circumferentially, the preloading and resilience urging the valves closed would not be present. Furthermore, because of the long cylindrical shape of cigarettes, there would be greater likelihood of bending the cigarette about a line perpendicular to its longitudinal axis, and thus unduly stressing the area adjacent the slits or valves, and enlarging them.

The size of the slits **25** is a major factor in controlling the amount of air that is admitted to the cigarette under given conditions. If too much air is admitted, the cigarette will not burn properly, and while it will be very easy drawing, very little of the smoke will reach the smoker's mouth. On the other hand, if too little air is admitted through the slits or valves **25**, their effect is minimized, and there is very little benefit to be gained. It has been found that if the slits or valves **25** are carefully made with a sharp knife so that the edges of the slits normally abut each other, as indicated in FIGURE 7, and the slits are approximately $\frac{3}{32}$ of an inch long, very satisfactory results are obtained. While four slits or

valves **25** and five ports **24** are shown in the present disclosure, it will be appreciated that a greater or lesser number of ports and valves may be used if so desired. However, the present arrangement has the advantage of providing rather uniform qualities for the cigarette throughout its length, without requiring excessive slitting.

It will be appreciated, of course, that the ports **24** and valves **25** need not be arranged in longitudinally extending alignment, but may be arranged in a helical configuration, or may be arranged around the circumference of the cigarette. However, in almost all instances it is desirable that the port **24** be displaced from the valves **25** so that tobacco will not pass through or become caught in the valves **25** so easily, since this would destroy the effectiveness of the metered flow of air into the interior of the cigarette.

From the foregoing, it will be seen that there has been provided a cigarette fully capable of securing the advantages and achieving the objects heretofore set forth. While a preferred form of the invention has been disclosed, it will be appreciated that modifications may be made therein, and the invention is not to be limited to the particular form or arrangement of parts herein described and shown, except as limited by the claims.

I claim:

1. A cigarette which includes: a filler; a wrapper enclosing said filler and having overlying portions; and inlet means in said wrapper comprising means defining a port extending through one of said overlying portions to a passageway between said overlying portions, and valve means extending through another of said overlying portions to admit air into said filler from said passageway, said valve means including normally closed lips resiliently urged together but capable of being opened when the pressure within said filler is less than the outside pressure.

2. A cigarette as defined in claim 1 in which said lips extend in a direction parallel to the longitudinal axis of said cigarette.

3. A cigarette which includes: a filler; a wrapper enclosing said filler and having overlying portions, the edge of the outermost overlying portion being adhered to the other overlying portion; and inlet means in said wrapper comprising means defining a port extending through the outermost overlying portion, circumferentially displaced from the adhering edge thereof, to a passageway formed by the adhering and non-adhering parts of said overlying portions, and valve means comprising a pair of lips formed by a slit in said other overlying portion, said valve means extending from said passageway to the interior of said wrapper, said slit being generally parallel to the longitudinal axis of said cigarette, the curvature of said wrapper about said axis acting to urge said lips together to close them, said lips being capable of being opened to admit air into said filler when the pressure within said filler is less than the outside pressure.

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