

(12) **UK Patent Application** (19) **GB** (11) **2 210 546 A**⁽¹³⁾
 (43) Date of A publication **14.06.1989**

(21) Application No **8822975.2**

(22) Date of filing **30.09.1988**

(30) Priority data
 (31) **8723142** (32) **02.10.1987** (33) **GB**

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(51) INT CL⁴
A24D 3/18

(52) UK CL (Edition J)
A2C CEGE

(56) Documents cited
GB 1276328 A GB 0442038 A GB 0383144 A

(58) Field of search
 UK CL (Edition J) **A2C CEGA CEGB CEGC CEGD**
CEGE CEH CEJ CGJA CGJB CGJC CGJX CGK,
A2M M1D M3G
 INT CL⁴ **A24D**

(54) **Mouthpieces for cigarettes**

(57) Cigarettes with tubular mouthpieces and shorter, more densely packed tobacco rods smoulder more efficiently than conventional cigarettes but leave a long stub when finished. This invention provides a cigarette 10 having a tubular mouthpiece 16 which collapses longitudinally when the cigarette is stubbed out. Mouthpieces are described which telescope, fragment or distort.

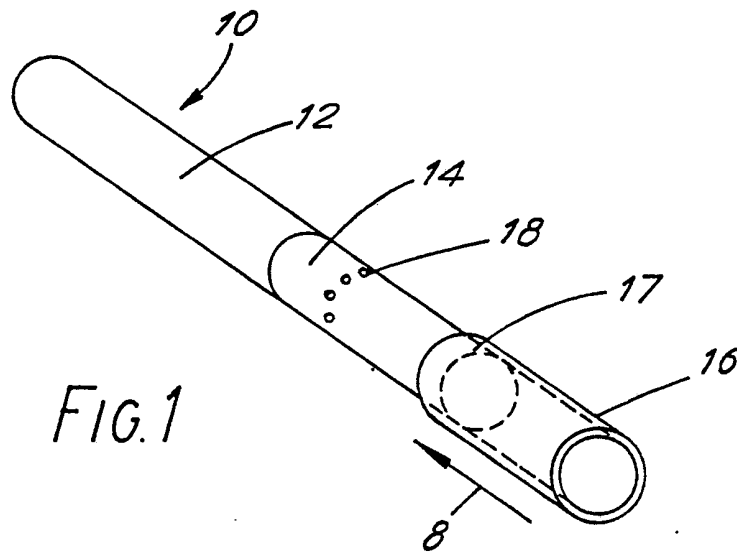


FIG. 1

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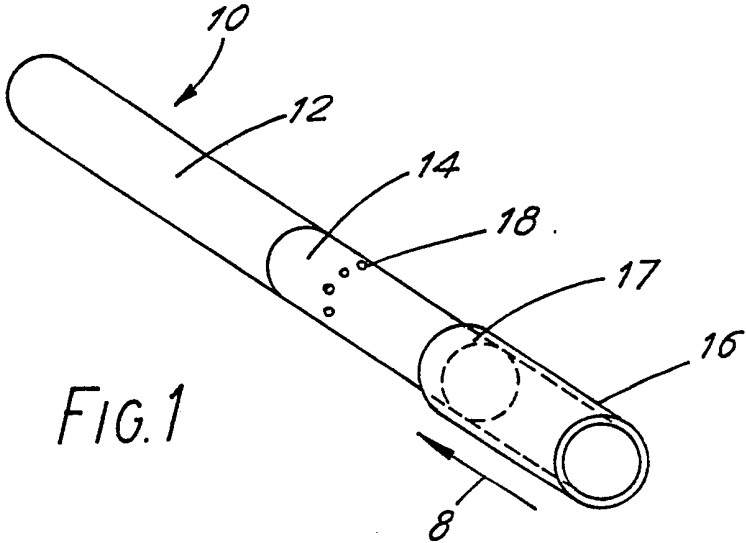


FIG. 1

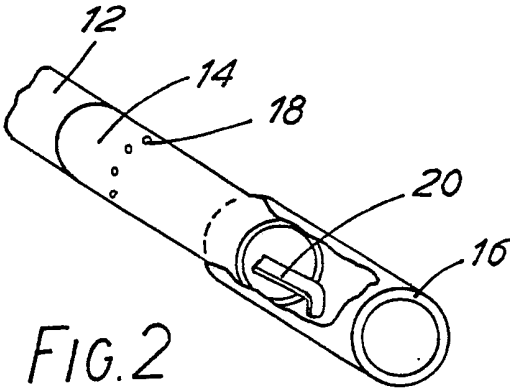


FIG. 2

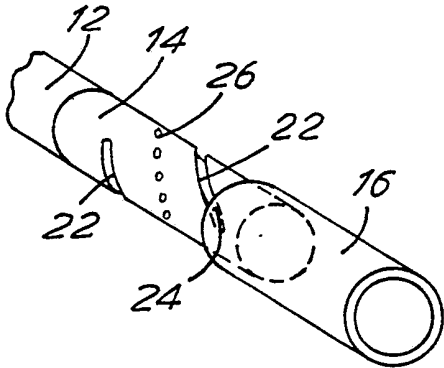


FIG. 3

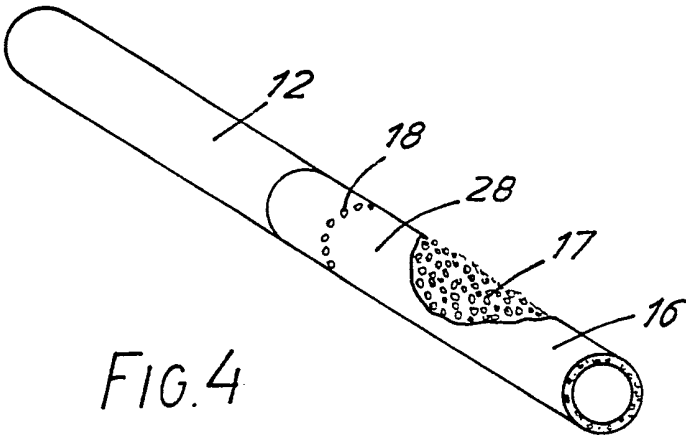
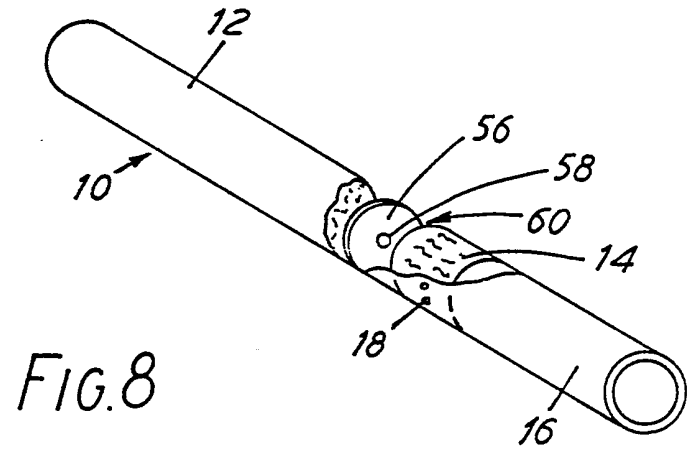
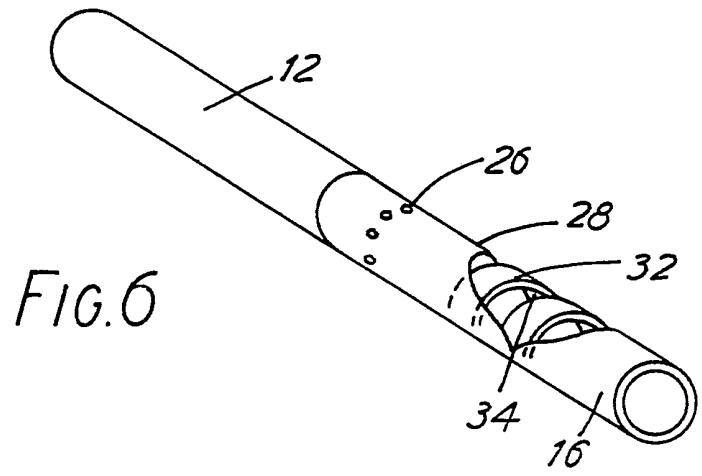
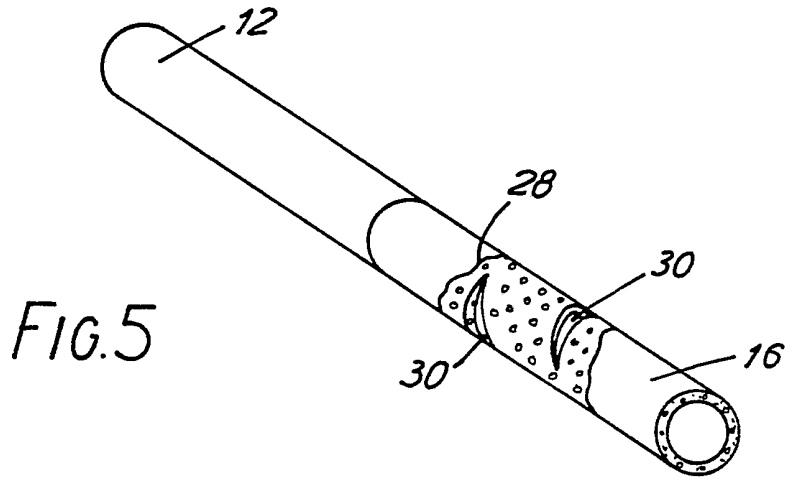
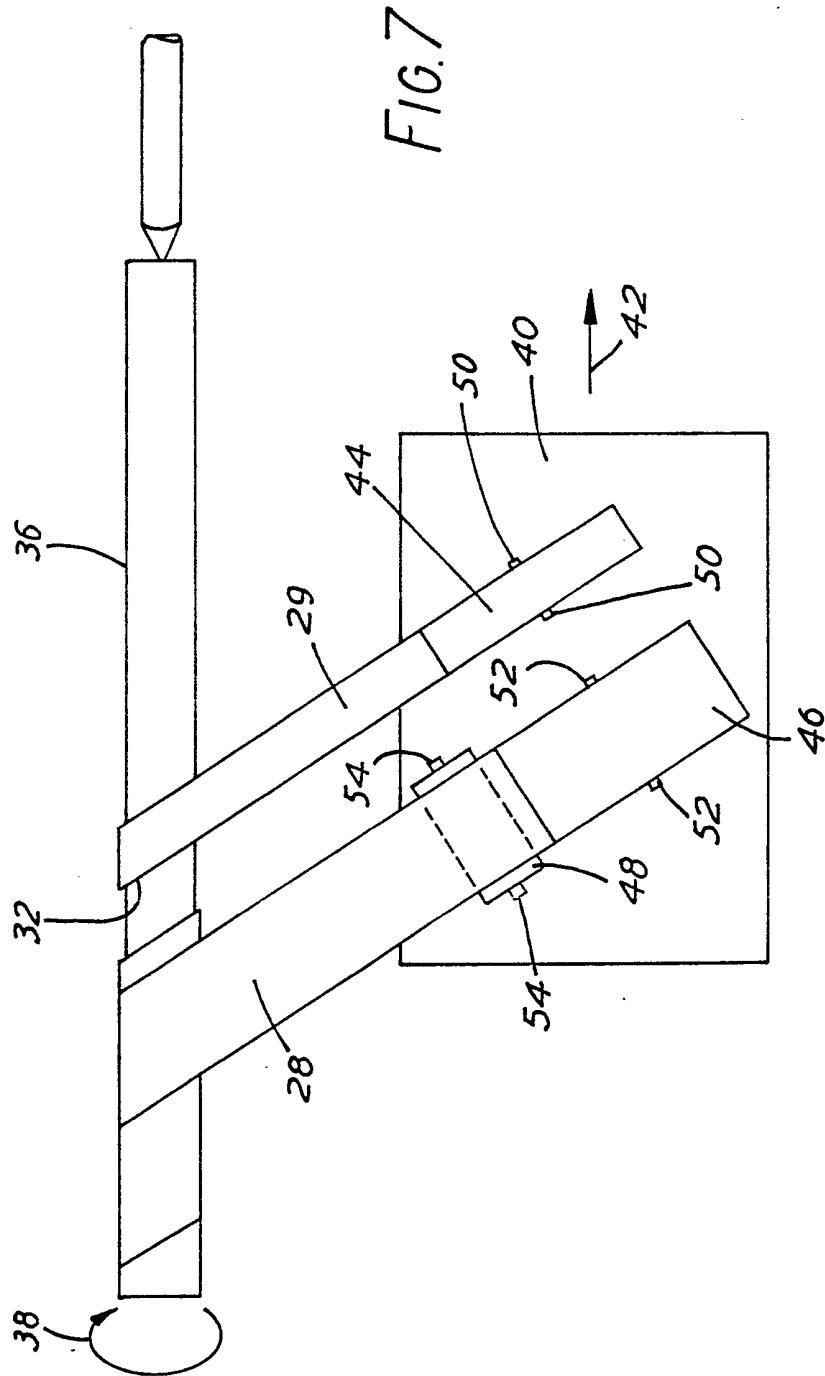


FIG. 4





IMPROVEMENTS RELATING TO SMOKING ARTICLES

This invention relates to improvements relating to smoking articles. In particular it concerns improvements to cigarettes that are provided with integral tubular mouthpieces.

Conventional manufactured cigarettes are inefficient in that only a small fraction of available tobacco is consumed by the smoker during puffing. Not only is this undesirable for the smoker, a consequence is that a large proportion of the tobacco contained in conventional cigarettes gives rise on smouldering to unwanted sidestream smoke.

The problems can be reduced by increasing the density of the tobacco in the cigarette thereby reducing smoulder rate. However, to provide the same acceptable pressure drop to the smoker, the length of the cigarette rod must be reduced. To make the product of acceptable size the short relatively slow burning tobacco rod sections are attached to tubular mouthpieces. Cigarettes having tubular mouthpieces will be referred to hereinafter as "papirosy" cigarettes. Papirosy cigarettes generally yield significantly less sidestream smoke per unit of mainstream smoke when compared with standard products smoked in the same way.

A disadvantage of a papirosy cigarette is that, when it has been smoked, the resulting stub, which consists principally of the mouthpiece and a filter plug (if present), is unsightly and difficult to dispose of tidily because of its length.

It is an object of the present invention to provide an improvement to the mouthpiece of a papirosy cigarette that enables the stub to be disposed of in a tidy fashion when the cigarette has been smoked.

According to the present invention there is provided a papirosy cigarette wherein the mouthpiece is adapted to be collapsed longitudinally when it is subjected to a force having a longitudinal component applied by a user.

In a first embodiment of the invention the mouthpiece may be adapted to be slid longitudinally over the filter plug or tobacco rod in the direction of the light-up end of the cigarette, there being provided means to prevent such sliding until a predetermined force has been applied by the user to the mouthpiece.

Said means may be provided by frictional engagement of the mouthpiece with the filter plug or tobacco rod.

There may be provided further means to prevent the mouthpiece from being separated from the filter plug or tobacco rod, such further means being a weak adhesive bond or a flexible web connecting the mouthpiece to the filter plug or tobacco rod, or a spigot means on the inner face of the mouthpiece engaging in a groove in the filter plug.

In a second embodiment of the invention the mouthpiece may be provided by a rigid open helix of cellulosic web wrapped overall with tipping paper and adapted to collapse longitudinally under a longitudinally applied force.

A section of the mouthpiece of the second embodiment may be filled with an acetate filter core, and may include perforated tipping paper.

In a third embodiment of the invention the mouthpiece may be made from compacted and bonded granules of a material such as expanded polystyrene or vermiculite in such a fashion that the mouthpiece fragments when subjected to a longitudinal force applied by the user.

The outer surface of the mouthpiece may be coated with adhesive to retain the granular fragments when the mouthpiece has fragmented.

The mouthpiece of the third embodiment may be permeable to air and may be partially filled with an acetate filter plug.

Optionally, the frictional or skew forces generated on stubbing out cigarettes of this invention may be used to release fragrances from appropriately located encapsulated or otherwise stabilised precursors.

The invention will now be described by way of example only with reference to the accompanying diagrammatic drawings in which,

Figures 1 to 6 are partly cut-away perspective views of a papirosy cigarette according to several embodiments of the invention,

Figure 7 is an overhead plan view of an apparatus for making the mouthpiece of the cigarette shown in Figure 6, and

Figure 8 is a partly cut-away perspective view of a further papirosy cigarette according to the invention.

Referring to Figure 1 there is shown a papirosy cigarette 10 according to the invention comprising a tobacco rod 12, a cylindrical filter plug 14, and a tubular mouthpiece 16 made of paper, card, or plasticized acetate tow or other materials known in the art. The filter plug 14 and the tobacco rod 12 are joined to each other in a known fashion and are wrapped in plugwrap and cigarette paper. The filter plug 14 is provided with a peripheral row of perforations 18. The mouthpiece 16 is frictionally mounted on the mouth end of the filter plug 14, the inner diameter of the mouthpiece being substantially equal to the diameter of the end of the filter plug so as to provide an airtight seal between the mouthpiece and the filter plug. The friction between the filter plug 14 and the mouthpiece 16 may be enhanced by a weak adhesive bond at an overlap section 17 between the plug and the mouthpiece.

The friction between the filter plug 14 and the mouthpiece 16 is such that there is no relative movement between the two during smoking and normal handling. However if, after smoking the cigarette, the smoker exerts a longitudinal force on the mouthpiece towards the stub of the tobacco rod 12, as when "stubbing out" the smoked cigarette, the mouthpiece slides over the filter plug in the direction of arrow 8 so as to provide a telescoped filter plug/mouthpiece combination that is substantially shorter than its original overall length thereby enabling the smoked cigarette stub to be more easily and neatly disposed of.

Figure 2 shows a variant on the embodiment of Figure 1 wherein the filter plug 14 and the mouthpiece 16 are connected by a flexible web 20 between the mouth end of the plug and the interior of the mouthpiece so as to prevent the mouthpiece from being pulled off the end of the plug.

However, the web permits the filter plug 14 and the mouthpiece 16 to collapse one over the other.

Figure 3 shows a further embodiment of the invention which shows another way in which the mouthpiece 16 may be attached to the filter plug 14. The filter plug 14 is provided with a helical groove 22, closed at both ends, in its cylindrical surface and the mouthpiece 16 is provided on its inner face with a spigot 24 which engages with the groove. The mouthpiece 16 can move relative to the filter plug 14 by a twisting movement but the ends of the groove limit the amount of travel of the mouthpiece over the filter plug. The filter plug 14 may be provided with a helical series of ventilation perforations 26 which provide the user with the option of varying the ventilation by relative movement of the mouthpiece 16 and filter plug 14. In an alternative arrangement the helical groove 22 may be provided on the inner face of tube 16 and the spigot may be located on the outer surface of member 14.

Figure 4 shows an embodiment of the invention in which the mouthpiece tube 16 is made of compacted and bonded granules 17 of expanded polystyrene or vermiculite, and its end butted to the tobacco rod 12, there being no filter plug. The tobacco rod and the tube are wrapped in tipping paper 28. A ring of perforations 18 permits ambient air to enter the tube. The strength of the tube is such that it will fragment and disintegrate when the cigarette is stubbed out. It is convenient to provide the outer surface of the tube with a coating of adhesive so as to retain the granular fragments of expanded polystyrene or vermiculite when the tube disintegrates. In alternative embodiments of the cigarette of Figure 4 the ring of perforations 18 may be omitted and the tube 16 may be permeable to air. A section of the tube 16 may be filled with an acetate

filter plug. The tube 16 may be end butted to a filter plug attached to the tobacco rod 12 by tipping paper.

Figure 5 shows an embodiment of the invention in which the mouthpiece tube 16, which may be of the same construction and materials as the tube of Figure 4 or alternatively may be made of cellulosic card as in the embodiment of Figure 1, is provided with longitudinally spaced and angularly offset circumferential "V" slits 30 which enable the tube to collapse when the cigarette is stubbed out. If it is desired to provide ventilation into tube 16, the tube can be wrapped in porous tipping paper 28. If no ventilation is required the tipping paper 28 may be impermeable. As in the embodiment of Figure 4, a section of the tube 16 may be filled with an acetate filter plug. Alternatively the tube 16 may abut a filter plug attached to the tobacco rod 12.

Figure 6 shows an embodiment of the invention in which the mouthpiece tube 16 is constructed of a rigid open helix 32 of paper card wrapped with impervious tipping paper 28 and attached to the tobacco rod 12 by tipping paper. This design combines radial strength with longitudinal weakness, so that when the cigarette is stubbed out the turns of the helix 32 collapse into the spaces 34 between the turns and result in the collapse of the tube 16 to approximately half its original length. As in the embodiment of Figure 4 a section of the tube 16 may be filled with an acetate filter core. The tube may be wrapped in impervious tipping paper provided with ventilation holes 26. Alternatively, the tube may be wrapped in porous tipping paper to provide ventilation through the spaces 34.

Figure 7 shows a diagrammatic representation of an apparatus 34 for

making the mouthpiece tube 16 of Figure 6. There is provided a rotary forming axle 36 of diameter equal to the inner diameter of the mouthpiece tube to be formed, the axle being driven by motor means (not shown) so as to rotate in the direction of arrow 38 (into the plane of the drawing). Located on a transverse table 40 adapted to move parallel to the axis of the forming axle 36 in the direction of arrow 42 are a roll 44 of paper card 29, a roll 46 of tipping paper 28 which may be perforated and a roller 48 for applying polyvinyl acetate adhesive to the tipping paper. The rolls 44, 46 and applicator roller 48 are mounted on axles 50, 52 and 54 respectively.

In operation the forming axle 36 is rotated at a constant angular velocity in the direction of arrow 38, the transverse table 40 is moved at a constant velocity in the direction of arrow 42, and a strip of paper card 29 is fed from the roll 44 onto the forming axle, the angle of feed relative to the axis of the forming axle, the diameter of the forming axle, the velocity of the transverse table and the width of the card being interrelated so that the card strip forms the open helix 32 described above with reference to Figure 6 on the forming axle, the gap between adjacent turns being substantially the same as the width of the card.

In a similar fashion, a strip of tipping paper 28 is fed from the tipping paper roll 46 over the polyvinyl acetate applicator roller 48 onto the helix 32 of card 29 that is already on the forming axle 36 so as to adhere to the card thereon. The angle of feed and the width of the tipping paper strip are such that the tipping paper 28 completely covers the helix 32 and the spaces between the turns of the helix so as to form a mouthpiece tube 16. A length of tube 16 is then removed from the

forming axle 36 and is cut into required mouthpiece lengths.

In Figure 8 there is shown yet a further embodiment of the invention in which there is provided a papirosy cigarette 10 comprising a tobacco rod 12 of normal or regular packing density, a filter plug 14 and a mouthpiece tube 16 as described in any of Figures 1 to 6 and including ventilating perforations 18 through the tipping wrapper into the filter plug. Between the filter plug and the tobacco rod there is provided an orifice disc 56 comprising a disc with a small central axial orifice 58. The disc is located adjacent the end of the tobacco rod 12 but spaced from the filter plug 14 to define a cavity 60 extending from the orifice disc to the filter plug. This design regulates smoke flow rate and hence puff burn rate via ventilation level. The existence of the disc 56 providing only the small orifice 58 for smoke flow introduces a significant increase in upstream resistance relative to the ventilation resistance, thereby increasing ventilation. Thus during each puff as the smoker draws on the mouthpiece 16, air will be drawn through ventilation holes 18 in preference to smoke being drawn through orifice 58 and thus through the tobacco rod 12, and a reduced burn rate will result. Smoulder rate will also be reduced because ambient air drawn in through ventilation holes 18 during smoulder will not be drawn so readily into the tobacco rod 12 to increase burn of the hot coal since the disc 56 will impede the free flow into the tobacco rod. Thus, reduced smoulder and reduced burn during puffs will result. This arrangement is intended to replace the more densely packed rod 12 arrangements of Figures 1 - 6, the mouthpiece 16 being of any of those designs.

In any of the embodiments described above

with reference to the drawings, there may be incorporated encapsulated or otherwise stabilised precursors adapted to release a fragrance as the longitudinal or skew forces are applied by the user to stub out the cigarette. Thus, in the embodiment of Figures 1 and 2 the encapsulated precursor may be included in the adhesive material providing the frangible bond at the area 17. In Figure 3 the encapsulated precursor could be sprayed or disposed within the helical groove 22. In Figure 4 the precursor could be embedded in the wall of the tube 16 and in the embodiments of Figures 5 and 6 it could be sprayed on the inner face of the paper overwrap of tubular section 16. In all cases the frangible capsule material will collapse and release its fragrance when the longitudinal or skew force is applied by the user in stubbing out the cigarette.

CLAIMS

1. A cigarette having a tubular mouthpiece adapted to be collapsed longitudinally when it is subjected to a force having a longitudinal component applied by a user.

2. A cigarette as claimed in claim 1 wherein the mouthpiece is adapted to slide longitudinally over the filter plug or tobacco rod of the cigarette, means being provided to prevent such sliding until a predetermined longitudinal force has been applied to the mouthpiece by the user.

3. A cigarette as claimed in claim 2 wherein said means is provided by frictional engagement of the mouthpiece with the filter plug or tobacco rod.

4. A cigarette as claimed in claim 2 or 3 wherein there is provided further means to prevent the mouthpiece from being separated from the filter plug or tobacco rod.

5. A cigarette as claimed in claim 4 wherein said further means is provided by a weak adhesive bond connecting the mouthpiece to the filter plug or tobacco rod.

6. A cigarette as claimed in claim 4 wherein said further means is provided by a flexible web connecting the mouthpiece to the filter plug or tobacco rod.

7. A cigarette as claimed in claim 4 wherein said further means comprises a spigot on the mouthpiece or filter plug engaging in a groove on the filter plug or mouthpiece respectively.

8. A cigarette as claimed in claim 1 wherein the mouthpiece is provided by a rigid open helix of cellulosic web wrapped overall with tipping paper and adapted to collapse longitudinally under a longitudinally applied force.

9. A cigarette as claimed in any preceding claim wherein the mouthpiece includes or is filled with a filter.

10. A cigarette as claimed in claim 1 wherein the mouthpiece is made from compacted and bonded granules of a material so arranged that the mouthpiece fragments when subjected to a longitudinal force applied by the user.

11. A cigarette as claimed in claim 10 wherein the mouthpiece is coated with adhesive to retain the granular fragments when the mouthpiece has fragmented.

12. A cigarette as claimed in claim 10 or 11 wherein the mouthpiece is permeable to air.

13. A cigarette as claimed in claim 12 wherein the mouthpiece is at least partially filled with an acetate filter plug.

14. A cigarette as claimed in any preceding claim wherein the frictional or skew forces generated on stubbing out the cigarette release a fragrance from appropriately located encapsulated or otherwise stabilised precursors.

15. A cigarette substantially as described with reference to and as shown in any of the drawings.

**POOR
QUALITY**