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## 54 **Improvements in or relating to smoking pipes.**

57 There is provided a smoking pipe 10 to render smokeable an inherently unsmokeable preformed rod 30 of tobacco. The pipe comprises a ventilated tubular member consisting of a laminate 9 of an inner combustible permeable paper 12 with a

ventilated incombustible layer 14. The laminate may further be wrapped in a ventilated incombustible foil 16. A filter 20 and a mouthpiece 22 may be provided.

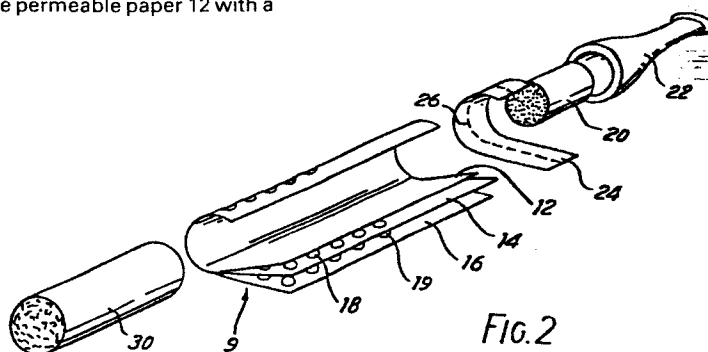


FIG. 2

IMPROVEMENTS IN OR RELATING TO SMOKING PIPES.

This invention concerns improvements in or relating to smoking pipes. In particular it concerns a disposable pipe for use with a preformed rod or plug of smoking material,  
5 the rod by itself being inherently unsmokeable.

A "pipe" in the context of this invention is a holder or container for a smoking material which holds or contains the smoking material during the smoking operation but is not itself wholly consumed during the smoking operation.

10 The smoking material envisaged by this invention includes tobacco, reconstituted tobacco, non-cellulosic material, or any combination thereof; and a preformed rod made therefrom is made so as to be inherently unsmokeable until it has been inserted in the pipe.

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According to the present invention there is provided a smoking pipe for use with a preformed rod of smoking  
20 material, the rod by itself being inherently unsmokeable, the pipe having a cylindrical portion adapted to receive and extend substantially over the length of the rod when inserted in the pipe, said cylindrical portion being provided with an incombustible cylindrical component also  
25 adapted to extend substantially over the length of the rod, and with ventilation means capable of sustaining static combustion of the rod when lit.

The pipe of the invention permits the combustion and smoking of preformed rods or plugs of tobacco or other smoking  
30 material, that by themselves are inherently unsmokeable, and combines ease of use and cleanliness with reduced sidestream smoke production, low fire ignition proclivity, retainment

of ash within the pipe, and reduced weight of tobacco or other smoking material.

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

Figure 1 is an oblique perspective view of a pipe according to the invention;

Figure 2 is an exploded view of the pipe of Figure 1 together with a preformed rod of tobacco; and,

Figures 3 and 4 are each an oblique perspective view of second and third embodiments respectively of a pipe according to the invention.

Referring to Figures 1 and 2 of the drawings there is shown a smoking pipe 10 for a preformed plug or rod of tobacco 30, the pipe comprising a linear cylindrical structure adapted to enclose the rod 30 and consisting of a laminate 9 comprising layers 12, 14, and 16. Layer 12, the innermost layer of the laminate 9, is a sheet of permeable paper of permeability in the range 5 - 200 Coresta units. The paper of layer 12 is of controlled air permeability and burn rate.

A Coresta unit is defined as a flow rate of millilitres of air per minute per square centimetre cross-section area of flow per 10 centimetres water gauge pressure.

Layer 14, the middle layer of the laminate 9, is a paper sheet with a substance of  $40 - 200 \text{ g m}^{-2}$  containing clay or other inorganic filler treated with a fireproofing agent such as sodium silicate (waterglass) and/or disodium orthophosphate. Layer 14 is perforated mechanically with about 50 holes 18, each of an area of about  $15 \text{ mm}^2$  and spaced regularly round the periphery of the pipe.

Layer 16, the outermost layer of the laminate 9, is a wrapper for cosmetic purposes and comprises an embossed aluminium foil which is also provided with holes 19 corresponding in position to the holes 18 in layer 14 so that ventilating air may pass through the holes 19,18 and then through the permeable paper 12 into the interior of the pipe. Layer 16 may be omitted without affecting the function of the pipe.

5 The rod 30 is of a preformed construction, such as smoking tobacco moulded, extruded, pressed, or pelleted with an adhesive, or may be wrapped in an open or highly permeable cellulosic web such as "teabag" tissue, and is characterised in that it is inherently unsmokeable by the user until it has been inserted within the pipe 10. When the rod 30 is within the pipe 10 it will be covered by the permeable paper 12 and, when lit, will then be smokeable by the user. It will be clear that, for efficient and safe smoking, the dimensions of the rod 30 will be such that it is a close fit within the pipe 10.

Teabag tissue is a coarse woven cellulosic web consisting of a pattern of thin areas, which in this context we shall refer to as "apertures". Typically, a teabag tissue may have about 25 "apertures" in a rectangular or diamond-shaped array per square centimetre, each "aperture" having dimensions of about 1 mm x 1 mm. The typical thickness of a teabag tissue "aperture" is 1 fibre, the regions of the web defining the boundaries of the "apertures" being several fibres thick. The teabag tissue may be strengthened by means of strips or strings of strengthening materials such as cotton, plastics, or impermeable paper.

30 Optionally, a smoke filter plug 20 integral with the pipe 10 is provided at the mouth end of the pipe and is inserted in an optional mouthpiece 22 made of a plastics or ceramic material.

The filter plug 20 is made of cellulose acetate fibre or tow, as is common in the art, but other materials or modes of construction may be preferred. The filter plug 20 is spaced from the tobacco rod 30 by a cylindrical air space.

- 5 Overlying the attachment between the mouthpiece 22 and the pipe 10 is provided a strip of cigarette paper 24 which is provided with ventilating apertures 26 to permit ventilating air to enter the spaces between the filter plug 20 and the tobacco rod 30. The size and number of the apertures 26  
10 will depend on the smoking characteristics desired but will typically provide diluting air in the range 0 - 80% of the volume of a puff. The strip of cigarette paper 24 is optional.

According to the smoking characteristics desired the holes 18 in layer 14 may be of any shape of individual area in the  
15 range 1 to 20 mm<sup>2</sup>, and the number of holes 10 may be from 20 to 200.

Layer 14 may alternatively be made from fireproof paper-like materials formed from glass fibre, ceramic fibre or carbon fibre in combination with cellulose fibre or alone in  
20 combination with each other.

The permeable layer 12 may, if required, contain burn control and ash modifying additives such as sodium citrate or potassium citrate or di-ammonium phosphate.

The pipe 40 of Figure 3 is similar in most respects to the  
25 pipe 10 of Figure 1 except that, instead of being a linear cylinder, the lower part 13 of the pipe 40 that receives the rod 30 is at an obtuse angle to the upper part 11 of the pipe 40, and no filter plug is provided. The lower part 13 is of the same general construction as the pipe 10 of Figures 1 and  
30 2; that is, it is made of the ventilated laminate 9 described above. The upper part 11 is of a flattened cylindrical shape, and provides a mouthpiece similar to that of the mouth

end of a traditional tobacco pipe.

The pipe 50 of Figure 4 is of identical shape to the pipe 40 of Figure 3. However, the lower part 13 is formed from a thin walled (0.4 - 1 mm) solid ceramic or glass fibre tube 5 15 wherein the inherent permeability of the tube is in the range 5 - 200 Coresta units. In pipe 50 the provision of a controlled permeability inner layer 12 of paper is not necessary to maintain combustion of the tobacco rod 30.

In a further embodiment of the invention the pipe 10 of 10 Figures 1 and 2 may be formed from a thin walled (0.4 - 1 mm) solid ceramic tube wherein the inherent permeability of the tube is within the range 5 - 200 Coresta units. In this embodiment the provision of a controlled permeability inner layer 12 of paper is not necessary to maintain combustion of 15 the tobacco rod 30. As in the exemplified first embodiment the ceramic tube may incorporate a smoke filter plug and/or mouthpiece and/or ventilation holes.

In yet another embodiment of the invention the pipe 10 may be constructed from a thin walled solid ceramic tube in 20 which holes of any shape with an individual area in the range 1 to 20 mm<sup>2</sup> are formed. This embodiment will require an inner liner 12 of controlled air permeability paper in order to sustain adequate combustion of the tobacco rod 30.

In all embodiments the pipe 10 will typically have an 25 external circumference in the range 23 - 35 mm and an overall length (not including the mouthpiece) in the range 7 - 120 mm. In the embodiments where the pipe has large perforations these may extend from 28 to 70 mm from the lighting end and may number from 20 to 200, depending on the overall dimensions 30 of the individual holes and of the pipe itself.

A small area of adhesive may be provided on the inner face of the pipe 10 so as to anchor the tobacco rod 30 when the rod is inserted into the pipe.

The pipe of the invention may be provided with a flavour generation capsule, or it may itself be impregnated with a flavour-generating substance.

The outside of the pipe may be provided with means such as thermochromic crystals to indicate the temperature of the pipe and hence how far the smoker has smoked the tobacco within the pipe.

Ventilation of the rod in the pipe so as to maintain static combustion when lit may alternatively be provided by one or more channels between the rod and the pipe extending from the lit end towards the mouth end. These channels may or may not be combined with ventilation through the wall of the pipe. The channels may be provided in the inner wall of the pipe or may be provided in the structure of the rod. The size of the channels will be chosen so as to suit the smoker's requirements.

The laminated pipe of the invention may conveniently be made using known convolute tube making technology whereby one or more layers of paper or other web material are wound round a former and glued together with adhesive. It is convenient in the present invention to use a fire-proof silicate based adhesive.

CLAIMS.

1. A smoking pipe for use with a preformed rod of smoking material, the rod by itself being inherently unsmokeable, the pipe having a cylindrical portion adapted to receive and extend substantially over the length of the rod when the rod is inserted in the pipe, said cylindrical portion being provided with an incombustible cylindrical component also adapted to extend substantially over the length of the rod, and with ventilation means capable of sustaining static combustion of the rod when lit.
2. A pipe as claimed in claim 1 wherein the ventilation is provided by the combination of apertures in the incombustible cylindrical component with an inner tubular member that is permeable and combustible.
3. A pipe as claimed in claim 2 wherein the inner tubular member is made of paper.
4. A pipe as claimed in claim 3 wherein the inner tubular member is made of paper of permeability in the range 5 - 200 Coresta units.
5. A pipe as claimed in claim 3 wherein the paper contains burn control and ash modifying additives.
6. A pipe as claimed in claim 5 wherein the burn control and ash modifying additives are selected from the group consisting of sodium citrate, potassium citrate, and di-ammonium phosphate.
7. A pipe as claimed in claim 2 wherein the incombustible cylindrical component and the inner tubular member together form a laminate.
8. A pipe as claimed in claim 1 wherein the incombustible cylindrical component is enclosed in a ventilated wrapper.
9. A pipe as claimed in claim 8 wherein the ventilated wrapper comprises perforated aluminium foil.
10. A pipe as claimed in claim 1 wherein the incombustible cylindrical component is made of a cellulosic material treated with a fire-proofing agent.



11. A pipe as claimed in claim 10 wherein the incombustible component is a paper sheet with a substance of 40 - 200 g m<sup>-2</sup> containing clay or other inorganic filler treated with a fire-proofing agent.
- 5 12. A pipe as claimed in claim 11 wherein the fire-proofing agent is selected from the group consisting of sodium silicate and disodium orthophosphate.
13. A pipe as claimed in claim 1 wherein the incombustible cylindrical component is made from an inherently
- 10 incombustible fibrous material.
14. A pipe as claimed in claim 13 wherein the incombustible component is made from a fire-proof sheet material formed from glass fibre, ceramic fibre or carbon fibre, alone, in combination with each other, or in combination with cellulosic
- 15 fibre.
15. A pipe as claimed in claim 1 wherein the incombustible component comprises a thin walled solid ceramic tube, the inherent permeability of the tube being in the range 5 - 200 Coresta units.
- 20 16. A pipe as claimed in claim 1 wherein the incombustible component is perforated.
17. A pipe as claimed in claim 16 wherein the incombustible component is provided with 20 - 200 holes, each of an area in the range 1 - 20 mm<sup>2</sup>.
- 25 18. A pipe as claimed in claim 1 wherein there is provided adhesive means on the inside of the pipe to secure the rod when within the pipe.
19. A pipe as claimed in claim 1 wherein there is provided in the pipe a filter plug downstream of the portion of the pipe
- 30 that is adapted to contain the rod.
20. A pipe as claimed in claim 19 wherein the filter plug is positioned to provide a space between the plug and the rod when the rod is within the pipe.
21. A pipe as claimed in claim 20 wherein there is provided
- 35 ventilation into the space between the plug and the rod.
22. A pipe as claimed in claim 1 including a mouthpiece.

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23. A pipe as claimed in claim 1 wherein the cylindrical portion of the pipe is at an obtuse angle to the remainder of the pipe.

24. A smoking pipe as claimed in claim 1 wherein the  
5 ventilation means is proved by at least one channel  
between the pipe and the rod when the rod is within the  
pipe, said at least one channel extending from the lit  
end towards the mouth end of the pipe.

25. A smoking pipe as claimed in claim 24 wherein said  
10 at least one channel is provided in the inner wall of the  
pipe.

