United States Patent [19]

Shaw

[11] **3,797,644**

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[54] **FILTER**

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[52] **U.S. Cl.** ..... **206/41 R**, 53/37

[51] **Int. Cl.** **B65d 79/00**, B65b 3/04

[58] **Field of Search** ..... 206/41 R; 53/37

[56] **References Cited**

UNITED STATES PATENTS

3,375,920	4/1968	Shaw	206/41 R X
1,728,473	9/1929	Brosius	206/41 R
3,206,059	9/1965	Fead et al.	220/44 R

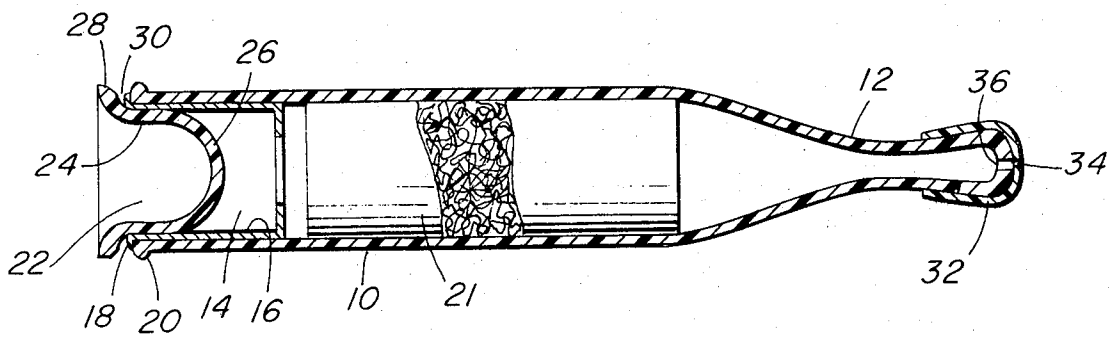
Primary Examiner—Leonard Summer

Attorney, Agent, or Firm—Wolf, Greenfield & Sacks

[57] **ABSTRACT**

A cigarette holder-filter includes a cigarette receiving socket at one end and a mouthpiece at the other end. The interior of the holder includes a fibrous filtering material impregnated with water. The ends of the holder are sealed in a manner both to prolong substantially the shelf life of the unit and to enable the holder to be filled fully with water. This is achieved by forming a minute air-escape hole in the otherwise sealed mouthpiece end of the filter to enable the interior of the filter to be filled fully and excessively with water before the cigarette-receiving end is sealed. The hole is small enough to minimize evaporation of the water.

4 Claims, 3 Drawing Figures



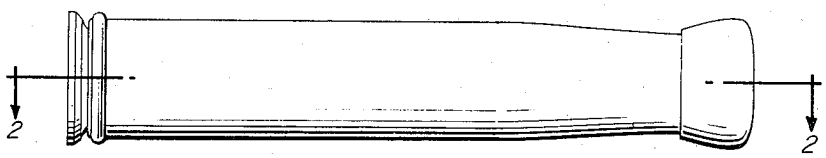


FIG. 1

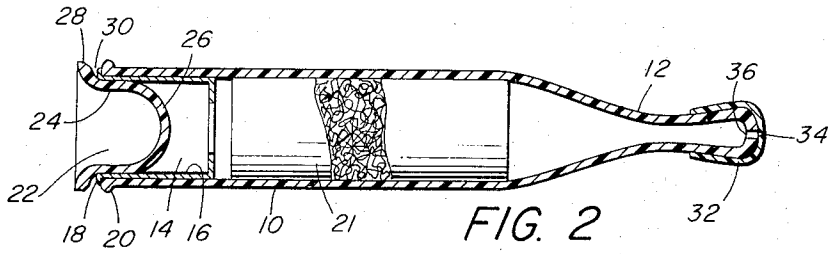


FIG. 2

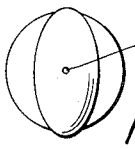


FIG. 3

FILTER

BACKGROUND OF THE INVENTION

This invention relates to improvement in cigarette filtering devices and particularly to those devices which are prepackaged with a water impregnated fibrous material. Among the difficulties which have been encountered with such devices is the tendency of the water to evaporate which results in a relatively short shelf life. Moreover, when substantial amounts of the water have evaporated, the filter looses its efficiency. While these difficulties may be overcome by employing a filter of the type described in my U.S. Pat. No. 3,375,920 by providing a special sealing arrangement to reduce materially the loss of water, the sealing of one end of the filter device may occasionally cause difficulty in filling of the device with water. Occasionally, the filter may be filled with an insufficient amount of water. It is among the primary objects of the invention to provide an improved filter and technique for fabricating the filter which insures that the fibrous filter material will be impregnated fully yet which also provides substantially increased shelf life.

SUMMARY OF THE INVENTION

The invention resides in providing a minute pin hole in the seal at the mouthpiece end of the device which enables air which might ordinarily become entrapped in the filter, to escape through the mouthpiece end when the filter is filled with water. Because there are no entrapped air pockets, the interior of the filter may be filled to saturate fully the fibrous plug and may even be filled beyond this amount. After the filter is filled with water the cigarette-receiving end is sealed. While the existence of the minute pin hole may permit a relatively small amount of water to evaporate and escape, the rate of any such escape is so insignificant in relation to the amount of water within the filter device as to still increase substantially the shelf life of the filtering device.

It is among the objects of the invention to provide an improved water impregnated cigarette filtering device which has a substantially extended shelf life.

A further object of the invention is to provide an improved cigarette filtering device and technique for manufacturing the device which provides a high degree of reliability in impregnation of the device with water while reducing the likelihood of entrapping air within the filter.

DESCRIPTION OF THE DRAWINGS

The foregoing and other objects and advantages of the invention will be understood more fully from the following detailed description thereof, with reference to the accompanying drawings wherein:

FIG. 1 is an illustration of a cigarette filter of the type described;

FIG. 2 is an illustration of the filter in section as seen along the line 2—2 of FIG. 1; and

FIG. 3 is an end view of the sealed mouthpiece of the filter.

DESCRIPTION OF THE PREFERRED EMBODIMENT

FIG. 1 shows, for example, one of a variety of disposable cigarette filters of the type with which the invention may be employed. Such filters are described generally in U.S. Pat. No. 3,137,303 and my aforementioned U.S. Pat. No. 3,375,920. These filters contain a fibrous material preimpregnated with water. Generally, the filter includes an elongated casing 10 formed from a plastic material. The casing has a tapered mouthpiece 12 formed at one end and an annular cigarette-receiving socket 14 at the other end. In the embodiment shown, a cylindrical metal sleeve 16 having an outwardly flared lip 18 is fitted firmly into the cigarette receiving end of the casing 10, with the lip 18 engaging a lip 20 formed on the casing. The sleeve 16 defines the cigarette receiving socket 14 and is proportioned to receive a cigarette in a snug fit. A fibrous material 21 is disposed within the casing rearwardly of the sleeve 16.

The completed filter is closed at its socket end with a cap 22 having a continuous sidewall 24 which is closed at the bottom by an integral and continuous dome-like bottom 26. The upper edge of the sidewall 24 is outwardly and arcuately flared to define a lip 28. This lip 28 is spaced from the lip 18 on the sleeve 16 to define a recess 30 of sufficient dimension to permit one to insert a fingernail between these two lips for removal of the cap 22. The cap is formed of a suitable substantially gas impervious plastic material having sufficient flexibility and resilience to permit insertion and removal of the cap with relative ease. For example, polyethylene may be an appropriate plastic material.

The mouthpiece end 12 of the device is covered with a removable covering 32 formed of a film of tearable plastic material. The covering 32 may be formed by dipping the mouthpiece end of the casing into a fluid plastic bath a sufficient distance to form the film over the mouthpiece end to enclose fully the mouthpiece. An appropriate material for the covering 32 should be non-toxic easily tearable or removable from the mouthpiece end in ordinary use. For example, the covering may be formed from a commercially available material known as "Thermi Cote N4" which is principally a mixture of cellulose acetate butyrate and dioctyl phthalate material.

In fabricating the filter, the fibrous material and sleeve 16 may be inserted into the casing 10. The mouthpiece end of the casing 10 then is dipped into the plastic film forming material to form the covering 32. After the covering film 32 has been formed but before the water is introduced into the filter, a minute pin hole 34 is formed through the covering 32 in communication with the internal passage 36 within the mouthpiece 12. After the pin hole 34 has been formed the casing may be filled to the desired extent with water. There is no tendency for air to become entrapped in the filter as the air may escape through the minute pin hole. As a result, it is insured that a sufficient quantity of water will be received in the device. After the device has been filled with water the cap 22 is inserted into the sleeve 16 to seal effectively the interior of the device. I have found that the single minute pin hole has no noticeable adverse effect on the shelf life of the filter. In shelf life tests which were conducted, there did not appear to be any adverse effect on the quantity of water retained within the filter. I have found that a pin hole approximately 0.030–0.040 inch diameter gives quite satisfactory results.

When one of the filters embodying the above construction is used the user unseals the ends and then blows through one end of the holder to discharge the

excess water contained therein. The cigarette holder then is ready for use with the assurance that the filter material is properly wetted.

It should be understood that the foregoing description of the invention is intended merely to be illustrative thereof and that other embodiments and modifications may be apparent to those skilled in the art without departing from its spirit.

Having thus described the invention what I desire to claim and secure by letters Patent is:

1. A cigarette holder construction comprising:

a casing having a mouthpiece end and a socket end adapted to receive a cigarette tip;

a fluid impregnable fibrous mass disposed within said casing between said ends;

a volume of fluid disposed within said casing, said volume of fluid being greater than that which is required to impregnate fully said fluid impregnable fibrous mass;

a removable cap for said cigarette end receiving socket adapted to engage and seal said socket; and

a removable covering for said mouthpiece end comprising a film of tearable plastic material, said film having a minute hole formed therein in communication with the interior of said casing.

2. A cigarette holder as defined in claim **1** further comprising:

said pin hole being no greater than approximately 0.040 inches in diameter.

3. A method of fabricating a cigarette holder as defined in claim **1** comprising:

filling said casing with said fluid impregnable mass;

dipping the mouthpiece end of said casing into said plastic material to form said film defining said removable covering;

thereafter piercing said film to define a minute hole in communication with the interior of said casing;

introducing said volume of liquid into said casing through the socket end thereof to enable air within said casing to escape through said pin hole; and

thereafter placing said cap in sealed engagement with said socket end of said casing.

4. A method as defined in claim **2** wherein said pin hole is no greater than approximately 0.040 inches in diameter.

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