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SMOKE PURIFYING DEVICES

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FIG. 1.

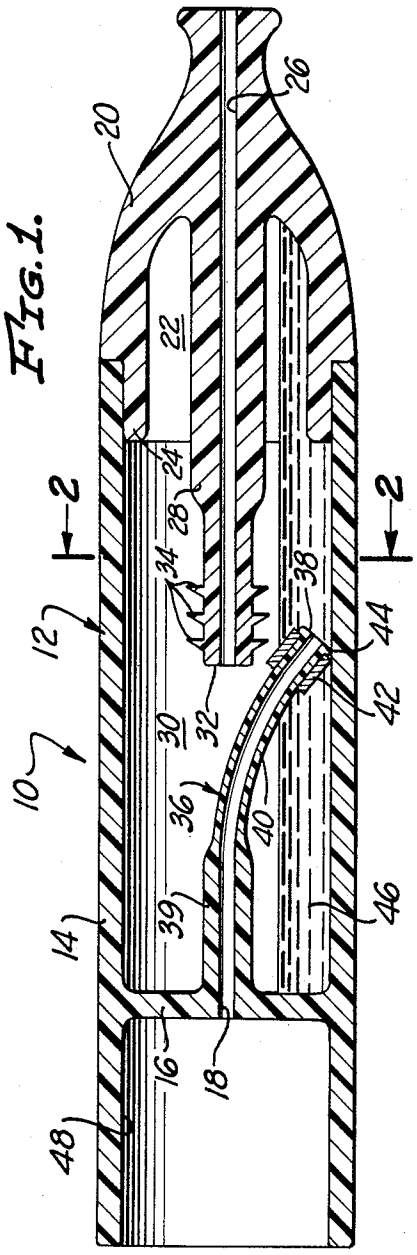
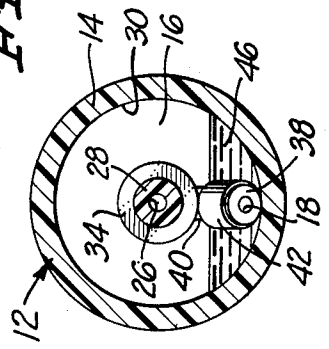


FIG. 2.



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SMOKE PURIFYING DEVICES

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1 Claim. (Cl. 131—173)

This invention pertains to new and improved devices for purifying tobacco smoke so as to eliminate from such smoke various objectionable chemical compounds.

At the present time a great deal of evidence is available that the smoke from cigarettes, cigars and pipes contains a number of chemical compounds which are considered to be either dangerous and/or detrimental to the human body. Many of these compounds have been specifically identified due to a great deal of research having been devoted to this general subject matter.

Because of the fact that techniques of organic chemical analyses are exceedingly difficult and time-consuming it is considered that many of these compounds still have to be specifically separated and identified. In spite of this fact, the problem of purifying tobacco smoke so as to avoid detrimental effects to the human body is well known and established.

A number of efforts have, of course, been made so as to alleviate this problem. Thus, for example, various types of activated carbon, regenerated cellulose, tobacco and other filters have been developed. Many of these filters are formed as an integral part of a cigarette or similar article. As a consequence of this, they are disposable and thrown away each time a cigarette or the like is smoked before they are used to a sufficient extent so that they clog up. From a chemical standpoint, such disposable filters are, of course, wasteful since they cannot be reused. Many of them are considered objectionable because of the effects upon the flavor of tobacco smoke.

It is also considered that many types of cartridge-type filters are objectionable for the same reason. Such cartridge-like filters, in general, consist of filter elements containing a filtering media disposed within a cartridge which in turn is mounted within some sort of an appropriate housing or container. After such cartridges have become used for a prolonged period, they become saturated with a tar-like residue and, hence, do not permit the ready passage of smoke. When they become clogged in this manner they thus interfere with the normal, desired "easy draw" type of operation in smoking. Also such cartridges are comparatively messy and difficult to remove from the housing. They also suffer from the disadvantage that from a purely comparative standpoint, they are relatively expensive. A number of devices are known which, in effect, combine a cartridge and a suitable housing. Such devices are considered undesirable for the various reasons indicated earlier in this paragraph.

An object of the present invention is to provide new and improved smoke purifying devices which overcome many of the limitations and disadvantages of prior devices or structures as briefly described in the preceding discussion. Another more specific object of the present invention is to provide smoke purifying devices which may be easily and conveniently manufactured at what is considered to be a comparatively nominal cost, and which are very effective for the purpose intended in that they do not unduly interfere with the "draw" characteristics involved in the normal smoking operation. A related object of this invention is to provide smoke purifying devices which may be easily taken apart and cleaned after prolonged use and which do not employ a filter element which has to be separately purchased.

These and various other objects of the invention, as well as many specific advantages of it, will be more fully apparent from a detailed consideration of the remainder

of this specification including the appended claims and the accompanying drawing in which:

FIG. 1 is a central longitudinal sectional view of a cigarette holder embodying a smoke purifier of this invention; and

FIG. 2 is a cross-sectional view taken at line 2—2 of FIG. 1.

The accompanying drawing is primarily intended so as to clearly illustrate a presently preferred form or embodiment of this invention. Because of the nature of this invention it will be realized that various changes of a routine engineering variety may be made in the precise structures illustrated without departing from the basic features or principles of this invention as indicated in this description and as defined or summarized in the appended claims.

As an aid to understanding the present invention it can be stated in essentially summary form that it concerns smoke purifying devices for use with cigarettes or the like, each of which devices includes an elongated housing, one end of which is formed as a mouthpiece and the other end of which is formed as a holder for a cigarette, this housing having an internal cavity which is in communication with the ends of the housing by means of separate passages. One of these passages is in communication with a rigid tube carried by the housing and the other of these passages is in communication with a flexible tube carried by the housing; both of these tubes extend into the cavity. The extremity of this flexible tube within the interior of the cavity carries a small weight. During the use of the device a quantity of water sufficient to substantially cover the weighted extremity of the flexible tube as the device is held in a horizontal postion but incapable of covering the free ends of the rigid tube is introduced into the cavity in this same position. As the device is used, smoke is drawn through this quantity of water so as to achieve a purifying type of treatment.

The actual details of the present invention will be best more fully apparent from a detailed consideration of the accompanying drawing showing a smoke purifying device 10 which includes an elongated two part housing 12. One part 14 of this housing 12 is in the form of an elongated cylindrical tube which is divided adjacent to one of its ends by means of a transverse wall 16 having a passage 18 located in its center. The part 20 of the housing 12 has the external shape of a mouthpiece and has a hollow interior 22 and a terminal cylindrical flange 24 which is capable of fitting within the cylinder 14 so as to create what can be referred to as a friction fit, enabling the part 20 to be removed from the part 14. The part 20 has a passage 26 which is in communication with the interior of a rigid tube 28; this tube 28 is mounted on the part 20 so as to extend from it along the axis of the cylindrical flange 24 into approximately the center of a cavity 30 defined by the parts 14 and 20 generally between these parts. The free end 32 of the tube 28 is surrounded by at least one outwardly extending flange or baffle 34.

The wall 16 carries a flexible tube 36 having a free end 38 located within the interior of the cavity 30. Preferably the tube 36 includes a portion 39 of sufficient wall 16 so as to extend therefrom in alignment with the 40 of sufficient wall thickness so as to be more flexible than the portion 39. The portion 39 is mounted on the wall 16 so as to extend therefrom in alignment with the tube 28, and so that the tube 36 is in communication with the passage 18. A small cylindrical, inert metal weight 42 is disposed around the tube 36 adjacent to the end 38 so as to be held in place by friction. If desired a small, bead like flange 44 can be located around the extremity of the weight 42 on the end 38 in order to prevent the

weight from sliding off of the tube 36. Preferably the tube 36 is sufficiently large so that the extremity 38 is located adjacent and below the tube 28 adjacent to the baffles 34. Thus the combined length of the tubes 28 and 36 are greater than the length of the cavity 30.

In order to use the device 10, the parts 14 and 20 are separated from one another and a quantity of water 46 is located within the cavity 30. This quantity of water should be roughly ⅓ of the volume of the cavity 30 and should be sufficient so that when the device 10 is held in a horizontal position the extremity 38 is substantially covered, but so that in the same position the extremity 32 is not covered. After the device 10 is "charged" with water in this manner a cigarette (not shown) may be inserted within the open end 48 of the part 14 so as to be held in place by friction. The cigarette can then be lighted and smoked in the customary manner. As combustion transpires the smoke produced will be drawn through the tube 36, through the water 46 and then through the tube 28 and the passage 26.

As the smoke moves through the water in this manner various tars and related products will tend to accumulate in the water 46, resulting in the smoke passing through the device 10 being purified to a substantial degree. As this occurs the accumulation of materials within the water 46 will result in a change in the surface tension of the liquid present within the device 10. This change in turn will result in an increasing tendency of the liquid present to foam, and as a result the purifying action as the device 10 is used will not be a pure liquid washing action, but will be a composite type of interfacial action between quantities of smoke and the surfaces within the foam. Such foam will be effectively inhibited from moving out through the tube 28 by virtue of the baffles 34 tending to break up the particles of foam.

In order to prevent any possibility of the liquid within the device 10 moving out of the cavity 30 it is preferred to form the extremities 32 and 38 of the tubes 28 and 36, respectively, so that they are of a material which is water repellent in that it is not wetted by water to a significant extent. Although this can be accomplished by appropriate types of conventional hydrophobic coatings on these extremities 32 and 38 it is presently preferred to accomplish this objective by forming both the parts 14 and 20 out of a relatively inert thermal plastic material such as polypropylene, various grades of polyethylene or the like having surface tensions such that these materials are not wetted by water. Preferably the internal diameters of these tubes 36 and 28 are less than about 0.100 inch since with passages or openings of this size in materials of a type as herein indicated there is little tendency for water to flow out of these tubes from the cavity 30.

When such materials are used the tube 36 may conveniently be formed as an integral part of the part 14 by varying the wall thicknesses so that only the tube 36 is sufficiently thin so as to be flexible. The part 20 should, of course, be manufactured so that all walls within it are sufficiently thick so as to be substantially rigid when it and the tube 28 are formed integrally with one another.

It will be further realized that this device may be easily disassembled for cleaning purposes whenever desired. Because of the nature of this invention it is to be considered to be limited solely by the accompanying claim forming a part of this disclosure.

I claim:

A smoke purifying device for use with cigarettes which comprises:

an elongated housing having a first end shaped as a mouthpiece and another end shaped so as to include a tubular portion adapted to hold a cigarette, means forming an elongated housing extending within the interior of said housing between said ends, said cavity being adapted to contain water, and passages extending through said ends into adjacent portions of said cavity;

a rigid tube integral with said first end extending from said first end into the central portion of said cavity, said rigid tube being in communication with the passage leading through said first end and having at least one baffle of flange like shape extending around its extremity within the interior of said cavity, said baffle having a substantially planar side facing said first end and at substantially right angles to said passage, said rigid tube having an interior dimension of less than about 0.100 inch in diameter, the extremity of said rigid tube being of a water repellent character;

a tube extending from said other end into the interior of said cavity, said tube being in communication with the passage extending through said other end, said tube being of unitary construction with said other end and being relatively inflexible adjacent said other end and relatively flexible towards its extremity, said tube being sufficiently long so that its extremity within said cavity is located alongside the extremity of said rigid tube within said cavity, said relatively flexible portion of said tube having an interior dimension of less than about 0.100 inch in diameter, the extremity of said tube within said cavity being of a water repellent character; and

a cylindrical weight positioned along the extremity of said flexible tube within said cavity and being secured to said flexible tube.

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