Dec. 30, 1941. E. H. LANGE 2,267,795

FILTER UNIT FOR TOBACCO PIPES

Filed Nov. 2, 1939

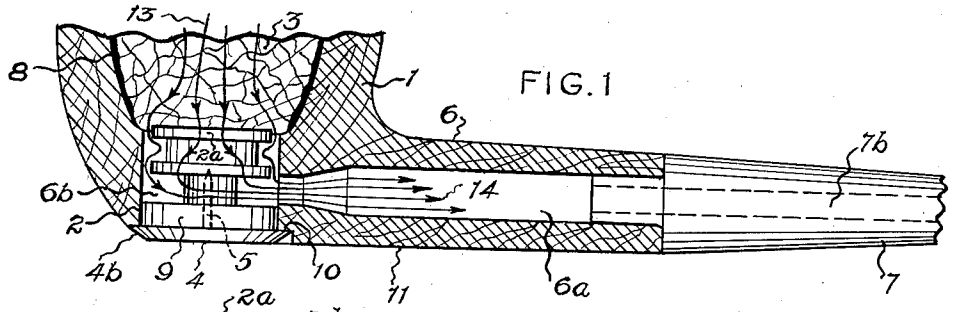


FIG. 1

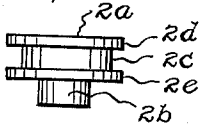


FIG. 2

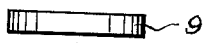


FIG. 3

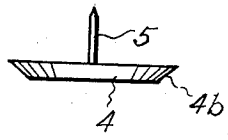


FIG. 4

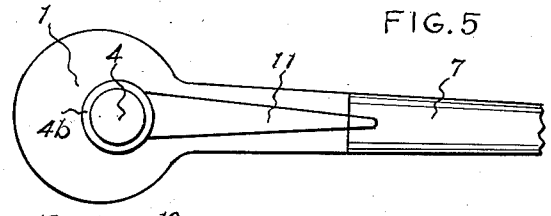


FIG. 5

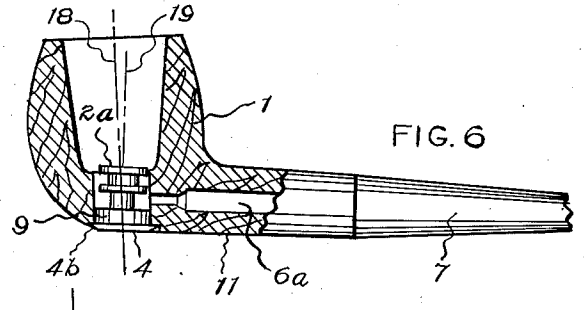


FIG. 6

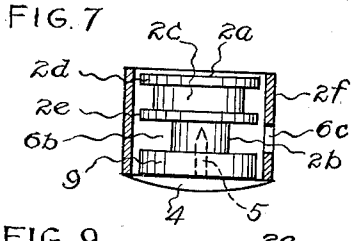


FIG. 7

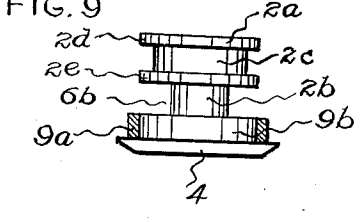


FIG. 9

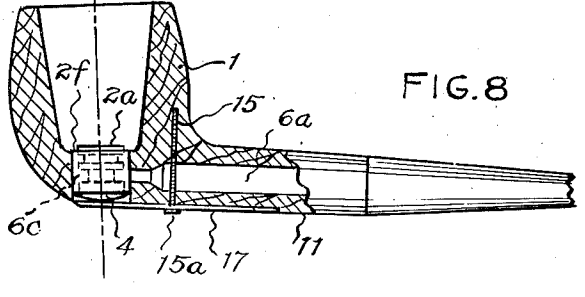


FIG. 8

WITNESS:
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FILTER UNIT FOR TOBACCO PIPES

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Application November 2, 1939, Serial No. 302,477

10 Claims. (Cl. 131—206)

This invention relates to tobacco-pipes, and more particularly to structures of tobacco-pipes and filter-units therefor, having certain advantages over hitherto disclosed filter-units in performance, in useful life of filter-unit, in the simple manner of ejecting a used filter-unit without the necessity of handling the used and soiled unit, in simplicity of structure enabling the filter-unit to be readily applied to conventional forms of briar-wood pipes with but slight modification of the external appearance of the tobacco-pipe, and in providing tar-free smoking stem.

One of the objects of this invention is to provide a filter-unit for tobacco-pipes suitable for direct contact with the tobacco in the tobacco-bowl, and consisting of wood or wood-like material capable of being readily formed, or turned, together with a gasket member suitable for sealing the pipe against objectionable leakage, which can be readily released from the pipe when desired without encountering binding from cold viscous tobacco-tar, and without binding from swelling or enlargement caused by absorption of moisture.

Another object of this invention is to provide filter-units having an annular space registering with the opening of the smoke-transmission conduit into the tobacco-bowl, and above a liquid-absorbent member, so that a large smoke-transmission channel is available around the entire periphery of the filter-unit for collection of smoke carried from the tobacco by a multiplicity of indirect passages.

Still another object is to provide a long-life filter-unit, requiring less frequent change than filter-units hitherto disclosed, and giving a higher degree of freedom for passage of smoke, that is, less objectionable resistance and hard-pulling of smoke.

A further object of this invention, is to provide filter-units having the above-stated advantages, which are readily made by simple machine processes at low cost, and which are readily adaptable to conventional forms of briar-wood tobacco pipes, and requiring neither costly changes in such pipes nor resulting in substantial change in the external appearance of such pipes.

These objects and others, will be apparent from further consideration of the following description, and are further pointed out in the appended claims.

Certain advantages of a tobacco-pipe with a hole through the bottom of the tobacco-bowl, a smoke-transmission conduit opening into this hole, and a filter-unit within the hole, in direct contact with the tobacco, having a gasket member and being easily ejectable from the pipe, have been pointed out in my U. S. Patents No. 2,105,539 and No. 2,169,730. With this arrangement, not only is objectionable matter concentrated at the source, but the smoking-stem and smoke-transmission conduit are maintained free from tar, and taking apart the pipe and handling used filters is eliminated.

Referring to the drawing,

Fig. 1 shows an assembly of tobacco-pipe with one form of filter-unit in position.

Fig. 2, Fig. 3, and Fig. 4 show component parts of the filter-unit of Fig. 1.

Fig. 5 shows a bottom view of a conventional form of pipe with a filter-unit attached, and Fig. 6 shows a side view of the same pipe.

Fig. 7 shows a modified form of filter-unit, with reference to the filter of Fig. 1.

Fig. 8 shows a tobacco-pipe with pivoted bottom member and the filter-unit of Fig. 7.

Fig. 9 shows another modification of the filter-unit of Fig. 1.

Referring to the drawing, Fig. 1, is shown a conventional form of briar-wood pipe in partial vertical section, the tobacco-bowl being shown at 1, the smoke-transmission conduit at 6*a* in the extension 6 of the tobacco-bowl, the bit or smoking-stem at 7 with the conduit 7*b* being only partially shown, the invention being not directed to the structure of the stem, which is of conventional type. At 3 is shown a charge of tobacco in the bowl 1, and at 8 a layer of carbonized tobacco. At 2 is a hole through the bottom of the tobacco bowl. The invention herein disclosed is directed to the structure or structures constituting attachments for a tobacco pipe, for use within the hole 2, with particular reference to the aforementioned objects of this invention.

Referring also to Figures 2, 3, 4, 5 and 6, at 2*a* is a part of a filter-unit, other parts being a projection 2*b*, an absorbent, resilient gasket member 9, and a cover member 4. The material of 2*a* and 2*b*, which are preferably of one piece, is absorbent wood, such for example as birch; however it will be understood that a variety of woods may be used. The part 2*a*—2*b* as will be apparent can be turned upon automatic wood turning machines. The part 9 is absorbent material, such as cork or thick card-board, both of which have proved satisfactory, it being important that the gasket have the property of absorbing moisture, of expansion to fit the bottom of the hole 2 tightly, and also being resilient,

so that large forces are not developed to bind the gasket against the walls of the hole so tightly that it cannot easily be pushed out from the top of the pipe, for example by a match stick. The cover-member 4, is a tack, such for example as a thumb tack having a beveled edge 4*b* and pin 5. The thumb-tack serves to bind the parts 2*a*—2*b* and 9 together, securely, and the beveled edge gives continuity to the lower surface of the tobacco-bowl, forming a smooth finish. The cover-member 4 is slightly counter-sunk at the bottom of the under-surface of the tobacco-bowl, so as to seat upon the surface 10, and thus make the under-surface of the extension of the bowl 11 in the same plane as the exterior of the head of 4. This not only provides a smooth under-surface finish, but also provides a flat surface upon which the pipe will rest in an upright position with stability, and yields a minimum of deviation in appearance from the conventional unmodified briar-wood pipe, the filter-unit cover 4 not being visible from any side view of the pipe, and in a view of the bottom of the pipe the circular cover 4 merely replaces the equivalent flat which would otherwise exist in place of the cover-member 4. When the cover 4 is finished in a natural wood finish, there is almost complete identity of appearance of the pipe with the filter-unit attachment and an unmodified pipe, viewed from the outside of the pipe.

The filter-unit has certain important structural features. Between the flanges 2*e*, 2*d*, there is an annular channel or orifice 2*c*, and likewise between the gasket-member 9 and the projection 2*b*, there is an annular channel or orifice 6*b*. The function of 6*b* is to register with the opening of the smoke-transmission conduit 6*a* into the hole 2, and to provide at all times a large, free passage for smoke to 6*a*, at all points of the periphery of the bottom of the tobacco-bowl. Moisture entering the space 6*b* from the smoking-stem or bit 7, is partially absorbed by the absorbent gasket-member 9, immediately below, to which it flows by gravity. The space at 2*c* is somewhat smaller than the space at 6*b*, and serves as a distribution duct for smoke and a collector-space for tobacco-particles and tobacco-tar which succeed in passing the primary barrier of the flange 2*d*. The flanges 2*d* and 2*e* are of such size that the structure will not bind within the hole 2 when the part 2*a*—2*b* is completely water-soaked, and the flanges fit the hole 2, substantially concentrically. It will be noted that the more moisture that the member 2*a*—2*b* holds, that is which has not been evaporated or absorbed by the gasket member 9, the larger will be its size, and the more restricted the passages between the flanges 2*d*, 2*e*, and the hole 2. This is an important feature of this invention, together with the wick-like action of the part 2*a*—2*b* in transmitting moisture by capillary transmission to the top of the member 2*a*, which top is in fact the wooden bottom of the tobacco-bowl, and in contact with relatively intense heat from the burning charge of tobacco. The supply of moisture is thus not only to a very large extent disposed of, but also serves to keep the top of the filter-unit from burning. The passages 2*c* and 6*b* serve as very effective impediments to objectionable particles and tar. Even where a stream-filament of smoke is substantially downward, the path is not a straight line, but because of eddies and turbulence caused by the edges of the flanges the heavier materials are deposited against the walls of the filter-unit. Many of the stream-filaments traverse the filter-unit with circumferential components of movement both in 2*c* and 6*b*, as well as downward components of movement, and there are thus a multiplicity of paths having numerous curvatures. Such stream-filaments are illustrated for example by 13, emerging from the unit at 14.

Figures 5 and 6, illustrate the same type of filter-unit applied to a tobacco-pipe having a slightly inclined bowl, as shown by the axis 18. When it is desired to preserve the continuity of the bottom flat of the pipe, the unit may be set in a vertical position as illustrated by the axis 19. This results in bringing the flanges 2*d*, 2*e* more closely across the opening of the smoke-transmission conduit into the hole 2, which results in an added advantage, which has been found to give excellent results in carrying out the objects of this invention.

In Fig. 7, a slightly modified form of filter-unit is shown, in this case the entire parts 2*a*, 2*b*, and 9, are of one piece of wood, the member 9 in this instance being sufficiently smaller than 2*f* that it will not bind when water-soaked, within the inner wall of the metal-tube 2*f*. The seal in this instance is made by the head of the cover-member 4 against the bottom of the tube 2*f*, an adjacent holding-member being used in this instance. The head of the cover-member 4 is preferably smoothly convex in this modification to form a self-adjusting contact with the holding-member 17, as illustrated in Fig. 8, for a pipe with slightly inclined bowl. The holding-member 17 is held by the screw-head 15*a* of the screw 15, about which it can turn to permit ejection of the filter-unit, this feature having been previously disclosed in the above-mentioned patents.

It will be evident that the unit of Fig. 7 can be turned entirely of one piece of wood if desired, that is the head 4 instead of being held by a pin 5 can be turned as part of 2*a*. Also it will be evident that instead of turning the parts of wood, molded wood-like particles can be used.

In Fig. 9, still another modification is shown, in which 2*a*, 2*b*, 9*b* and cover-member 4 are of one piece of wood, and a resilient gasket-ring such as 9*a* is attached to take up swelling of the wood 9*b*, and to effect a seal which can easily be removed when desired without objectionable binding. Obviously, a tack form of cover-member may be substituted for the one-piece form of cover-member, if desired. The form of filter unit of Fig. 9 can be used in place of the unit shown in Figures 1, 2, 3, and 4.

In practice, the unit disclosed in Fig. 1 and Fig. 9, snaps into the bottom of the hole 2 with sufficient tightness to prevent objectionable leakage from the bottom of the pipe, and at the same time a used filter-unit is easily removable when completely used, simply by use of a match-stick or similar instrument. By pushing down within the tobacco-bowl upon the exhausted unit, the unit is removed, without the necessity of soiling the hands, or of taking the pipe apart. These units have been found to have a life many times the life of any of a variety of tubular paper units employed as stem-filters, besides being effective in elimination of objectionable foreign substances from the smoking-stem or bit, and from the smoke-transmission conduit. Severe tests with these units over a very considerable period of time, have shown that even with an indicated over-use of filter-units, the smoke-transmission conduit is thoroughly protected against collection and accumulation of tobacco-tar therein. Such

over-used filter units do not have upon them the thick collection of tar evident from inspection of a relatively short-lived tubular paper stem-filter. This action is apparently due to effectiveness of the large channel **6***b* as a reservoir, to the absorption of the gasket-member, and to the restrictions of the flanges **2***d*, **2***e*, together with the fact that instead of free contact of saliva with the tobacco as in conventional forms of pipe, the contact in this structure is principally by the slower capillary flow through the body of the filter-unit toward the charge of tobacco, enabling a controlled evaporation of saliva to minimize formation of tobacco-tar.

While I have shown and described several structures of filter-unit embodying the invention and carrying out the objects set forth, it will be apparent that other changes may be made in the details of structure, and within the spirit of this invention, as further set forth in the appended claims.

What is claimed is:

1. In a tobacco-pipe having a tobacco-bowl, a smoke-transmission conduit, and a hole through the bottom of the tobacco-bowl connected with said conduit, a filter-unit for insertion into said hole from the bottom of said hole, said filter-unit having a capillary-transmission member attached to a cork disc by means of a beveled edge thumb-tack, said capillary-transmission member being of wood with fibres along the axis of the tobacco-bowl, of cylindrical form having a primary channel above said cork disc for registering with the smoke-transmission conduit, and having a secondary channel above said primary channel, said cork disc being capable of sealing the bottom of said hole, and said thumb-tack conforming with the bottom contours of the tobacco-bowl.

2. In a tobacco-pipe having a tobacco-bowl, a hole through the bottom of the tobacco-bowl with a concentric enlargement at the bottom of the tobacco-bowl, and a smoke-transmission conduit opening into the side of said hole, an ejectable filter-unit within said hole and enlargement, having a turned wooden member attached to a cork disc by means of a beveled-edge thumb-tack, said turned wooden member forming with said cork disc a primary channel around said hole, registering with the opening of the smoke-transmission conduit into said hole, said cork disc being capable of sealing the bottom of said hole, and said beveled-edge thumb-tack serving to seat upon said enlargement and to conform with the adjacent contours of the bottom of the tobacco-bowl.

3. In combination with the structure defined in claim 2, a channel around said turned wooden member, above said primary channel.

4. In a tobacco-pipe having a tobacco-bowl, a hole through the bottom of the tobacco-bowl with a concentric enlargement at the bottom of the tobacco-bowl, and a smoke-transmission conduit opening into the side of said hole, an ejectable filter-unit within said hole and enlargement, having a resilient-disc gasket-means for sealing the bottom of said hole, a turned wooden member turned with its axis parallel to the wood-fibres, concentrically and loosely fitting said hole, forming the bottom for the charge of tobacco and in direct contact with the tobacco, and cover-means fitting said concentric enlargement, conforming with adjacent contours of the bottom of the tobacco-bowl, having pin-means for binding together said resilient-disc and said wooden member.

5. In combination with the structure defined in claim 4, channel means around the axis of said wooden member, for providing a multiplicity of indirect passages leading from said charge of tobacco to the opening of the smoke-transmission conduit into the side of said hole.

6. In a tobacco-pipe having a tobacco-bowl, a hole through the bottom of the tobacco-bowl and a smoke-transmission conduit opening into said hole, a filter-unit within said hole, across said opening of the smoke-transmission conduit into said hole, having resilient holding means for securely sealing the bottom of said hole, and having a turned wooden member loosely fitting said hole substantially concentrically, directly contacting the bottom of the charge of tobacco, the axis of said turned wooden member being parallel with the fibres of the wood, providing a minimum impedance to vertical fluid-flow for evaporation.

7. In combination with the structure defined in claim 6, a channel around the axis of said turned wooden member registering with the opening of the smoke-transmission conduit into said hole.

8. In combination with the structure defined in claim 6, a primary channel around said turned wooden member registering with the smoke-transmission conduit, and a secondary channel around said member above said primary channel.

9. In a tobacco-pipe having a tobacco-bowl, a hole through the bottom of said bowl with a concentric enlargement at the bottom of said hole, and an opening of the smoke-transmission conduit into said hole, a filter-unit insertable into said hole from the bottom of said hole, having a cylindrical member directly contacting the tobacco of said bowl, and extending across said opening, and having circumferential grooves, one of which registers with said opening, resilient gasket-means for securely holding the cylindrical member in the bottom of said hole, and a button-like end for seating upon said concentric enlargement, conforming with adjacent contours of the bottom of the tobacco-bowl, having pin-connecting means for binding together said cylindrical member and said gasket-means.

10. In a tobacco-pipe having a tobacco-bowl, a hole through the bottom of said bowl, and a smoke-transmission conduit with an opening into said hole, a filter-unit insertable into said hole from the bottom of said hole, having a cylindrical absorbent member directly contacting the tobacco of said bowl and extending across said opening, and having annular channels around said cylindrical absorbent member, one of which registers with said opening, resilient gasket-disc means for sealing and holding the cylindrical member in the bottom of said hole, and a pin-attachment means for readily binding together said absorbent-member and gasket-disc means.

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