May 20, 1941. O. TURINSKY 2,242,805

SMOKING PIPE

Filed Dec. 30, 1939

Fig. 1.

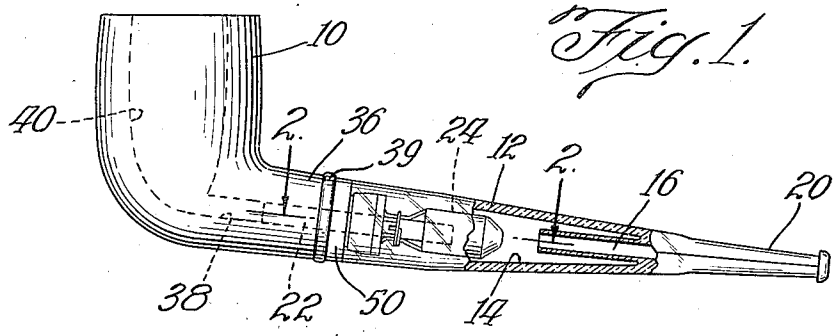


Fig. 2.

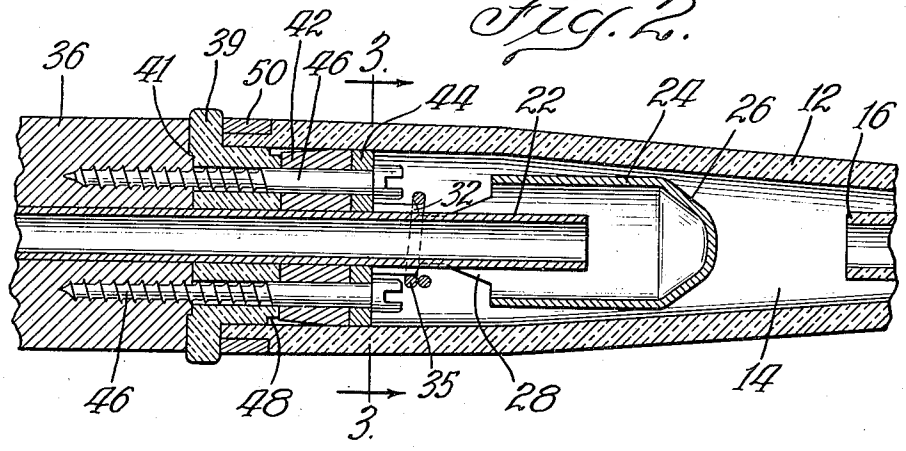


Fig. 3.

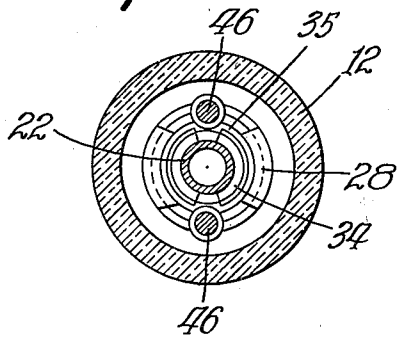
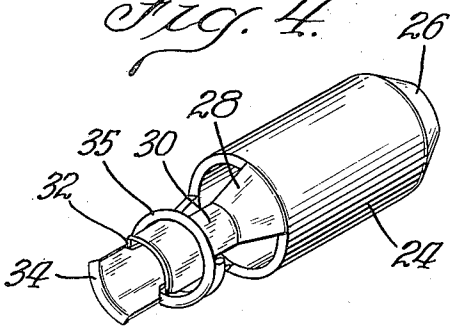


Fig. 4.



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SMOKING PIPE

Otto Turinsky, Chicago, Ill.

Application December 30, 1939, Serial No. 311,852

8 Claims. (Cl. 131—225)

My invention relates to smoking pipes and includes among its objects and advantages an improved arrangement of baffles in the cooling chamber of a pipe equipped with such a chamber and an improved joint between the stem and bowl of such a pipe

In the accompanying drawing:

Figure 1 is a side elevation of a pipe according to the invention;

Figure 2 is a section on line 2—2 of Figure 1;

Figure 3 is a section on line 3—3 of Figure 2;

Figure 4 is a perspective view of the removable cup baffle.

In the embodiment of the invention selected for illustration the pipe comprises the conventional bowl 10, and an air-cooled stem 12 of plastic material. The stem is made hollow to define the cooling chamber 14, the bowl end of which is closed by thrusting the stem over the closure parts carried by the bowl to complete the enclosure of the chamber. Within the chamber itself I provide pipe section 16 formed in the plastic itself at the right hand end of the bitt 20. Projecting into the other end is a similar tube 22 permanently assembled with the bowl. Liquid accumulating in the chamber is thus trapped against exit at either end. Over the end of the tube and completely supported thereby I provide the cup 24, which functions as a baffle. The cup 24 comprises a simple cylindrical body closed at its right end by a bottom 26. From the edges of the tubular body at the other end, arms 28 project forwardly and inwardly, and are continued as gripping portions 30 which, in assembled position, engage the outside of the tube 22 to support the cup 24. The grips 30 are slightly widened about midway of their length as indicated at 32, and at their extreme ends the metal is flared back to define a lip 34 which assists the user in putting the baffle in place. I prefer to use a baffle of aluminum and to reinforce the same mechanically by means of a ring 35 of chromium or nickel plated steel or other metal of greater strength than aluminum, which ring is a simple helix of about one and one quarter turns and encircles the arms 30 to hold them against spreading. The tube 22 extends part way through the short stem portion 36 of the bowl 10, and the smoke passageway is continued as at 38 to open into the cavity 40 of the bowl. It will be apparent that smoke withdrawn from the bowl 40 will issue from the pipe 22 and be turned back on itself to flow in an annular stream out of the cup 24 and then again turned back on itself to flow outside the cup 24 but still inside the stem 12 over to the outlet pipe 16. As the chamber 14 is of material volume, the smoke will be in that chamber for an appreciable length of time. More particularly, when the smoker is not puffing deeply, the volume of the chamber is of the order of magnitude of the amount of smoke withdrawn at a puff, so that a chamber full of smoke may remain in the chamber quiescent for several seconds between successive puffs. In any event the time taken for the smoke to pass through the chamber is sufficient to permit it to be appreciably cooled both by radiation and convection, and in all normal usage to be cooled below the temperature at which the tarry constituents of the vapors leaving the actual combustion zone inside the bowl will condense. I have found in practice that with a correctly designed pipe, it is possible by smoking gently to condense most of the nicotine content in such gases, but more vigorous use of the pipe will carry somewhat more of the nicotine through into the user's mouth and still condense certain tarry constituents of higher boiling point than nicotine. Since it is these tarry constituents of higher boiling point that are the main source of irritation to the user's mucus membranes the smoke inhaled is materially less irritating and seems to be correspondingly more fragrant and enjoyable. The cooling effect is sufficient to enable the smoker to smoke each pipeful until the zone of actual combustion works down to the opening of the passage 38, and the pipe goes out because there is nothing left to burn.

The solid materials defining the chamber 14 are substantially always somewhat cooler than the gases drawn through them when the pipe is lit. And the most rapid cooling of the gases will occur when those gases are in contact with material of high thermal conductivity. Thus those fractions that are solid, or nearly solid, will be condensed in or around the cup 24, where they can be readily wiped out with a match stem or the like. In previous embodiments employing a metal tube 16, in place of one of plastic material, a second abrupt cooling would occur in the tube 16, which resulted in the deposit of a substantially black coating in the passage through the bitt 20. This deposit had an unsightly appearance and it was difficult to clean it away. The use of a plastic trap tube 16 substantially reduces the deposition of coating in the bitt 20.

During the use of such a pipe, amber colored liquid accumulates rather rapidly in the chamber 14, although the volume of the chamber is such that in ordinary use, several pipefuls can be

smoked before the accumulation of liquid in the chamber makes it necessary to empty the chamber. However, the chamber does require frequent emptying, and for that reason the durability of the joint between the stem and the bowl becomes a critical factor. Such a joint must be easily assembled and disassembled, and at the same time be substantially airtight when the user is smoking, and mechanically sufficiently tight to avoid accidental separation of the parts. It must also be unaffected by contact with the condensates in the chamber.

Referring particularly to Figure 2, the bowl portion 36 abuts an annular fitting 39, which fitting encircles the tube 22 and is provided with an annular recess defining a shoulder at 41 and may be suitably cemented to the abutting end of the bowl portion 36 to constitute a permanent assembly. At its other end, the fitting 39 abuts the sealing washer 42 which in turn abuts the metal retaining washer 44, which retaining washer is adjustably held and pressed against the sealing washer by two long wood screws 46. The threads of the screws bite into the wood part 36, but the fitting 39 has holes large enough to clear the threads.

After experimenting with various materials, I have secured best results with a washer 42 of the best quality cowhide leather which has been chrome tanned and retanned. Such washers are punched out about 1/64" larger in diameter than they are intended to be when installed in the pipe, and then impregnated with a special wax as follows:

Melt a suitable quantity of wax, of a grade having a melting point of about 160° F., carefully avoiding any heating of the wax above 230° F. in the melting process. Place the bucket of melted wax in a larger bucket containing water to act as a constant temperature bath and keep the water in the outer bucket boiling gently during the impregnating process. In this way, get the wax to a temperature between 180° F. and 210° F., and then immerse in the wax a wire screen basket containing a considerable number of leather washers. These washers at the time of immersion will be cooler than the wax and must be stirred with a stick to keep them from solidifying enough wax to freeze them to each other. They should be completely immersed in the wax and stirred about every five minutes and kept in the wax for from 17 to 21 minutes, preferably exactly 20 minutes. Then the washers are removed from the wax and thrown onto a wire screen and agitated to remove excess wax. As soon as the washers are cool enough to be handled with the hands, excess wax can be wiped off them with the hands, and by repeated wiping substantially all excess wax can be removed.

The wax preferred for the impregnation is a highly amorphous paraffine wax of relatively definite melting point. The paraffine waxes referred to in the trade as Barnsdall wax possess these characteristics to a greater degree than any others I know of at present, and it is my impression that they are produced by combining fractional distillation with some sort of polymerization. Such wax reveals no crystalline structure under ordinary microscopic examination, but with polarized light and extreme magnification there may be some showing of submicroscopic crystalline structure.

After such a treatment, a few of the washers will be found to have swollen or become distorted or spongy, and these are discarded. The remaining washers will be found to have shrunk slightly and the grain side of the leather will have shrunk less than the opposite side. Also the shrunken washer will be just a trifle smaller in radial dimensions than is desired in the finished assembly. The washer is now slipped in place over the tube 22, the central hole having been punched very carefully before impregnation so as to have a finished washer which engages the surface of the tube 22 but is not expanded by forcing it into place over the tube. Then the retaining and compressing washer 44 is put in place and the screws 46 are driven home to the position of Figure 2. It will be noted that in Figure 2 the washer is shown in contact with the wall of the stem for approximately one third of its axial dimension, which third is adjacent the compression washer 44. To the left of this there is a slight but significant clearance between the sealing washer and the stem, and this clearance is supplemented by the annular rabbet at 43 in the fitting 39. In making such an assembly, the wood screws 46 are screwed down lightly and the stem slipped in place, and the degree of contact between the washer 42 and the stem is adjusted to be as shown in the drawing by tightening the wood screws 46 more or less.

In a pipe thus adjusted, with a washer impregnated as hereinabove described, the changes in dimension of the washer during a long period of use are almost entirely negligible, and any material swelling or shrinkage can be taken care of by the user by the simple process of tightening the wood screws 46 a half turn if the joint tends to become a little loose, or backing them off a half turn if the joint tends to become a little tight. In quantity production it is found that the average change in the dimensions of the washer is an expansion so slight that it just about compensates for the smoothing and polishing of the contact surfaces by use. Thus a large majority of such pipes never require an adjustment of the wood screws 46, even after a service period that runs into years, but the adjustment is easily made in the occasional instances when it is required. It is also found that stems and bowls that are completely interchangeable can be produced within the limits of accuracy of ordinary commercial manufacturing processes.

To provide additional mechanical strength in the stem and avoid splitting or cracking of the plastic, an annular metal reinforcing band 50 is housed in an external rabbet at the end of the stem.

This application is a continuation in part of my copending application serial number 272,836, filed May 10, 1939, now Patent Number 2,230,872, issued February 4, 1941.

Without further elaboration the foregoing will so fully explain my invention that others may, by applying knowledge current at the time of application, readily adapt the same for use under various conditions of service.

I claim:

1. In a pipe of the type comprising a bowl portion made up of a bowl proper and an extension projecting laterally from the bottom of said bowl proper, and a tubular stem defining a large condensation chamber with thin walls; a quick-detachable slip joint adapted to hold the bowl portion and stem securely during smoking or carrying but to permit quick removal by a combined twisting and pulling motion and quick assembly by a combined twisting and pushing mo-

tion; said joint including an annular leather washer fastened to said bowl portion and of outer peripheral dimensions to fit inside an end of said stem with friction against the inner wall of said stem; and washer-holding means offset from the axis of said washer and penetrating said washer to positively prevent rotation of said washer during removal and assembly of said bowl portion and stem; said washer-holding means comprising an annular plate overlying said washer, and a plurality of headed members having heads engaging said plate to compress said washer, and bodies penetrating said plate and washer and extension; said headed members having screw threaded connection with said extension, and heads with irregularities to facilitate turning said members, whereby the degree of compression of said washer may be adjusted by the user; said extension including a tubular member passing axially through said washer, and a flat abutment face opposing said plate, whereby adjustment of said headed members expands said washer outwardly but not inwardly; said washer and extension being shaped to fit in the end of said tube with a small annular clearance space where said washer abuts said extension; said extension including a portion adjacent said washer shaped to fit inside said tube and afford a bearing surface axially spaced from said washer.

2. In a pipe of the type comprising a bowl portion made up of a bowl proper and an extension projecting laterally from the bottom of said bowl proper, and a tubular stem defining a large condensation chamber with thin walls; a quick-detachable slip joint adapted to hold the bowl portion and stem securely during smoking or carrying but to permit quick removal by a combined twisting and pulling motion and quick assembly by a combined twisting and pushing motion; said joint including an annular leather washer fastened to said bowl portion and of outer peripheral dimensions to fit inside an end of said stem with friction against the inner wall of said stem; and washer-holding means offset from the axis of said washer and penetrating said washer to positively prevent rotation of said washer during removal and assembly of said bowl portion and stem; said washer-holding means comprising an annular plate overlying said washer, and a plurality of headed members having heads engaging said plate to compress said washer, and bodies penetrating said plate and washer and extension; said headed members having screw threaded connection with said extension, and heads with irregularities to facilitate turning said members, whereby the degree of compression of said washer may be adjusted by the user; said extension including a tubular member passing axially through said washer, and a flat abutment face opposing said plate, whereby adjustment of said headed members expands said washer outwardly but not inwardly; said washer and extension being shaped to fit in the end of said tube with a small annular clearance space where said washer abuts said extension.

3. In a pipe of the type comprising a bowl portion made up of a bowl proper and an extension projecting laterally from the bottom of said bowl proper, and a tubular stem defining a large condensation chamber with thin walls; a quick-detachable slip joint adapted to hold the bowl portion and stem securely during smoking or carrying but to permit quick removal by a combined twisting and pulling motion and quick assembly by a combined twisting and pushing motion; said joint including an annular leather washer fastened to said bowl portion and of outer peripheral dimensions to fit inside an end of said stem with friction against the inner wall of said stem; and washer-holding means offset from the axis of said washer and penetrating said washer to positively prevent rotation of said washer during removal and assembly of said bowl portion and stem; said washer-holding means comprising an annular plate overlying said washer, and a plurality of headed members having heads engaging said plate to compress said washer, and bodies penetrating said plate and washer and extension; said headed members having screw threaded connection with said extension, and heads with irregularities to facilitate turning said members, whereby the degree of compression of said washer may be adjusted by the user; said extension including a tubular member passing axially through said washer, and a flat abutment face opposing said plate, whereby adjustment of said headed members expands said washer outwardly but not inwardly.

4. In a pipe of the type comprising a bowl portion made up of a bowl proper and an extension projecting laterally from the bottom of said bowl proper, and a tubular stem defining a large condensation chamber with thin walls; a quick-detachable slip joint adapted to hold the bowl portion and stem securely during smoking or carrying but to permit quick removal by a combined twisting and pulling motion and quick assembly by a combined twisting and pushing motion; said joint including an annular leather washer fastened to said bowl portion and of outer peripheral dimensions to fit inside an end of said stem with friction against the inner wall of said stem; and washer-holding means offset from the axis of said washer and penetrating said washer to positively prevent rotation of said washer during removal and assembly of said bowl portion and stem; said washer-holding means comprising an annular plate overlying said washer, and a plurality of headed members having heads engaging said plate to compress said washer, and bodies penetrating said plate and washer and extension; said headed members having screw threaded connection with said extension, and heads with irregularities to facilitate turning said members, whereby the degree of compression of said washer may be adjusted by the user.

5. In a pipe of the type comprising a bowl portion made up of a bowl proper and an extension projecting laterally from the bottom of said bowl proper, and a tubular stem defining a large condensation chamber with thin walls; a quick-detachable slip joint adapted to hold the bowl portion and stem securely during smoking or carrying but to permit quick removal by a combined twisting and pulling motion and quick assembly by a combined twisting and pushing motion; said joint including an annular leather washer fastened to said bowl portion and of outer peripheral dimensions to fit inside an end of said stem with friction against the inner wall of said stem; and washer-holding means offset from the axis of said washer and penetrating said washer to positively prevent rotation of said washer during removal and assembly of said bowl portion and stem; said washer-holding means comprising an annular plate overlying said washer, and a plurality of headed members having heads engaging said plate to compress said washer, and bodies penetrating said plate and washer and extension.

6. In a pipe of the type comprising a bowl por-

tion made up of a bowl proper and an extension projecting laterally from the bottom of said bowl proper, and a tubular stem defining a large condensation chamber with thin walls; a quick-detachable slip joint adapted to hold the bowl portion and stem securely during smoking or carrying but to permit quick removal by a combined twisting and pulling motion and quick assembly by a combined twisting and pushing motion; said joint including an annular leather washer fastened to said bowl portion and of outer peripheral dimensions to fit inside an end of said stem with friction against the inner wall of said stem; and washer-holding means offset from the axis of said washer and penetrating said washer to positively prevent rotation of said washer during removal and assembly of said bowl portion and stem.

7. In a pipe of the type comprising a bowl portion made up of a bowl proper and an extension projecting laterally from the bottom of said bowl proper, and a tubular stem defining a large condensation chamber with thin walls; a quick-detachable slip joint adapted to hold the bowl portion and stem securely during smoking or carrying but to permit quick removal by a combined twisting and pulling motion and quick assembly by a combined twisting and pushing motion; said joint including an annular washer fastened to said bowl portion and of outer peripheral dimensions to fit inside an end of said stem with friction against the inner wall of said stem; and washer-holding means offset from the axis of said washer and penetrating said washer to positively prevent rotation of said washer during removal and assembly of said bowl portion and stem; said washer-holding means comprising an annular plate overlying said washer, and a plurality of members engaging said plate to compress said washer, and penetrating said plate and washer and extension; said members having screw threaded connection with said extension, whereby the degree of compression of said washer may be adjusted by the user.

8. A combination according to claim 7 in which said washer is of leather impregnated with a wax substantially inert in the presence of tobacco smoke.

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