

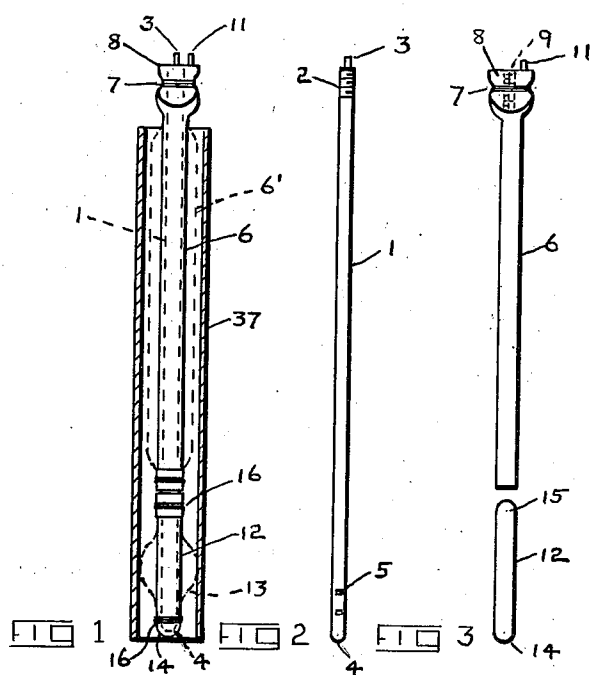
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INFLATABLE PLUG

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INFLATABLE PLUG

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3 Claims. (Cl. 138—93)

This invention relates to expansible collapsible plug and filler core apparatus employable as a preparatory means for the application of a solvent solution for the removal of scale from, and disinfecting, the interior of traps and adjacent plumbing with the least waste of the solution.

The objects of the improved apparatus are to provide associated means for temporarily plugging the interior of a trap, or other pipe section of plumbing, at a given place; to provide means for erecting an elongated collapsible filler core within said trap or pipe and above the plugging means therein to decrease the interior cubic area of the pipe interior to a marginal part thereof in which to receive only an economical supply of solvent solution; and to provide convenient means for detaching and replacing the collapsed plug and filler core upon the apparatus.

Referring to the accompanying drawing the Figure 1 illustrates the improved apparatus with certain parts collapsed within a cross-section of pipe, the dotted lines showing the parts as expanded of which one part has a limited expansion; the Figure 2 illustrates the flexible tubing support of the apparatus; the Figure 3 illustrates the detached collapsed members.

Referring more particularly to the accompanying drawing, and especially to the Figures 1, 2 and 3, the tubing 1 is preferably of metal which is flexible to at least a certain degree, but any other type of tubing suitable to its peculiar requirements may be used in place thereof if desired, but when openings leading to traps and adjoining plumbing parts are small, such as the perforations through fixed grille plates, and the like, which openings are often not greater than one-quarter of an inch each in diameter, the tubing 1, including the collapsed equipment which it carries, as hereinafter explained, must be of such outside diameter as may be inserted within such small openings. However, when the size of openings permits, such as when the grille plate is removable, the tubing 1 may be of a fabric reinforced type of flexible tubing with an inserted flexible flat metal bar as a means of added support and of directional guidance to the tubing within pipe interiors having bent courses. The upper end of the tubing 1, as illustrated by the Figure 2, is exteriorly threaded, as at 2, for a purpose to be explained, and that end is also provided with the intake valve 3. The lower end of the tubing 1 is permanently closed and exteriorly rounded, as at 4, and adjacent thereto

the wall of the tubing 1 is provided with the perforation 5. A filler core 6 of a rubberized fabric in tubular form is so reinforced that it has but a limited degree of expansion which may be predetermined at the time of manufacture, the filler core 6 being bound within a groove 7 of the screw cap 8, which has a central opening 9 therethrough and a thick surrounding wall with an opening parallel to the central opening 9, as at 10, and communicating with the interior of the filler core 6; the opening 10 being provided with the intake valve 11. The expansible plug 12 is preferably of pure gum rubber tubing with a closed end 14 and a contracted opposite end opening 15. While the plug 12 is detachable, and therefore readily replaceable, it is the member of the apparatus that is constantly included whenever the apparatus is equipped for use. In attaching, the plug 12 is placed over and upon the closed end 4 of the tubing 1 as far as it will reach and both extreme ends of the plug 12 are each securely bound around the tubing 1, as at 16, the perforation 5 communicating with the interior of the plug 12. The filler core 6 is best placed upon the apparatus whenever the extent of pipe interior is of such length that a great quantity of solvent solution would be required to fill that interior. In attaching, the open end 15 of the tubular length of filler core 6 is placed over the upper end of the tubing 1 and down thereon as far as it will reach and until the central opening 9 of the screw cap 8 is aligned with the intake valve 3 and the screw cap 8 screwed down tightly upon the exterior thread 2, the filler core 6 being permitted to rotate around the tubing 1 to follow the rotation of the screw cap 8 during its attachment. The lower end of the filler core 6 is then securely bound around the tubing 1.

In operation, when the filler core 6 is omitted from the improved apparatus, the tubing 1, equipped with the attached plug 12, is inserted longitudinally within the opening necessary to reach the particular interior of the trap or other pipe 37, that interior first having been given a supply of solvent solution, and then means applied through the tubing 1 to expand the plug 12, the means being the attachment of an air pump with the intake valve 3 of the tubing 1 to force air into the plug 12 by way of the interior of the tubing 1 and the perforation 5 until the exterior of the plug 12 is made to bind all around against the interior wall surface of the pipe 37 at the place therein where the plug 12 is thus anchored, as at 13. Following the

anchoring of the plug 12 as aforesaid the solvent solution may be emptied into the opening, or one of the associated openings when the apparatus has been inserted through a grille plate, and the pipe interior above the plug 12 is filled up with the solution. Therefore with applications of the solvent solution below and above the plug 12 the action of the solution is directed independently in both directions from the plug 12 within the trap or pipe 37.

The operation, when the filler core 6 is included as a part of the apparatus, is quite similar to that above explained with the exception that, following the anchoring of the plug 12 in its desired location within the trap or pipe 37 the air pump is transferred in its connection from the intake valve 3 to the intake valve 11 to now force air into the filler core 6 to expand it to its predetermined outside diameter 6' so that there is left outside of the filler core 6 a marginal cubic capacity of the interior of the trap or pipe 37 into which solvent solution is to be directed to reach the interior wall surface of the trap or pipe 37 above the anchored plug 12 with a consequent vast saving of solution over and above that which would be required in the absence of such filler core 6.

It will be noted that, while merely for the purpose of illustration the proportions in both length and diameter as shown in the drawing do not portray by reason of lack of space a full conception of the apparatus, it must be understood that in the Figures 1, 2 and 3 the length of the apparatus may be as long as the need may demand and the outside diameter of the fully equipped apparatus may be such as will enable it to be passed through a very small opening. In actual experience the apparatus in fully equipped form has been passed through an opening one-quarter of an inch in diameter.

I claim:

1. An apparatus for preparing traps and the like in a plumbing system for an insertion of a solvent solution, the apparatus comprising a length of flexible tubing; an intake valve within one end of the tubing; a plug member in the form of an expansible receptacle carried by, and communicating with the interior of, the oppo-

site end of the flexible tubing; a filler core member in the form of a collapsible elongated tube with limited expansion and covering a substantial length of the flexible tubing; and separate means communicating with the filler for its expansion.

2. An apparatus for preparing traps and the like for the economical insertion of a solvent solution, the apparatus comprising a flexible length of tubing having a closed end; an intake valve with which the opposite end is provided; perforations in the wall of the flexible tubing adjacent the closed end; a plug member in the form of an expansible receptacle placed over said closed end and said perforations and securely bound at both extreme ends around the flexible tubing; a detachable expansible collapsing tubular filler core having a limited expansion and secured at one end to a cap having therethrough a central opening and a thick surrounding wall; a second opening parallel to said central opening and extending through said wall; a second intake valve with which the wall opening is provided communicating with the interior of said filler core, the core being placed over the flexible tubing and the cap central opening placed over the intake valve of the flexible tubing, the opposite end of the filler core being securely bound around the flexible tubing and means for securing the cap to the intake valve.

3. An apparatus for preparing a trap, or the like, in a plumbing system for an economical insertion of a solvent or other solution in direct and prolonged contact with the interior wall of a trap, the apparatus comprising an elongated flexible support; a filler core member in the form of a collapsible elongated tube of material having a limited expansion and covering a substantial length of the support; a closed extremity with which the filler core member is provided; an intake valve with which the opposite end of the filler core member is provided; separate means adapted to fully plug at a predetermined place the trap interior; and means by which the filler core may be expanded laterally within the plugged trap and to an exterior diameter less than the interior diameter of the trap.

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