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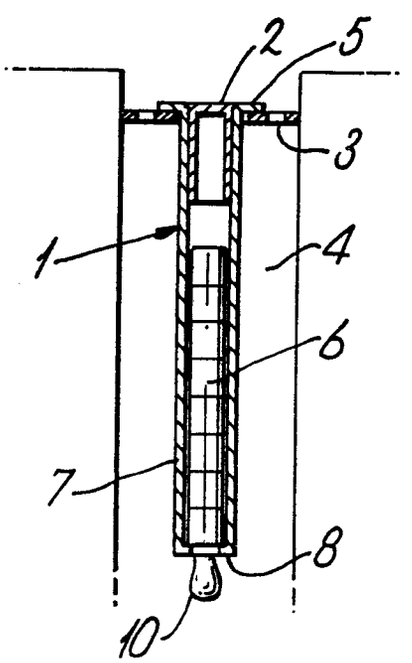
(54) Dispenser for soluble material.

(57) A dispenser 1 for soluble materials takes the form of a hollow elongate body fabricated in solvent-impermeable material. Soluble material 6 is enclosed in the body which is suspended at its position of use, for example from the ring 3 of a sink drain hole 4. The dispenser 1 has a least one hole 9, preferably at its lower end 8 so that solvent passing over the dispenser is drawn inside by surface tension. Dissolved material can then be released as a drop 10. By selecting the number and size of the holes 9, the rate of release of the soluble material 6 is varied.



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DISPENSER FOR SOLUBLE MATERIAL

The present invention relates to a dispenser for soluble material such as bleach, disinfectant, insecticide and the like.

In order to disinfect the drain of a sink or the like, it is desirable to provide a dispenser which fits within the drain and which contains bleach or other disinfectant, some of the bleach or disinfectant being dissolved each time water passes down the drain. In this way it may be ensured that the water always contains a suitable quantity of bleach or disinfectant. One known dispenser has a ceramic stick which is impregnated with disinfectant and perfume and encased in a stiff nylon net. As water passes over the dispenser, some of the disinfectant and perfume is dissolved and so passes into the drain. In this known dispenser, the use of the nylon net permits water to reach the entire surface of the ceramic stick, and so ensure that all the disinfectant may be extracted from the stick.

However it has been discovered that the extraction is too efficient, particularly when the water passing down the drain is hot. Then there is a massive release of disinfectant, far more than is needed to disinfect the drain, and the disinfectant in the stick rapidly becomes exhausted.

According to the present invention a dispenser for soluble materials is provided which comprises an elongate body in solvent impermeable material and solid soluble material enclosed within the body, having means at one end portion of the body for suspending the dispenser at its position of use and having at least one hole in the body the total cross sectional area of the hole(s) being small relative to the total outer surface area of the body.

The invention seeks to provide a dispenser capable of slow release of soluble material. The soluble material, in solid form, is contained in a hollow body of water impermeable material such as glass, ceramics, or a plastics material. The body has one or a few small holes, or a small area of open mesh, so that the total area of holes or mesh is a small percentage of the total area of the body. As water passes over the hollow body some passes through the hole(s) into the interior of the body and dissolves a quantity of the soluble material before release from the body. It is not intended that the water should be able to flow through the body in the course of its passage. The inside of the body is a dead-end to water flow.

The concept of holes occupying only a small percentage of the body area covers many possibilities. If, as is frequently the case, the material to be dissolved is highly soluble, it may be preferred not only to limit the quantity of liquid that reaches the interior

of the dispenser, but also to have only a small part of the soluble material exposed to the liquid at one time. To this end the holes or mesh may be towards the lower end of the body, so that only the soluble material within this lower part is substantially exposed to leaching by the liquid. A preferred construction is to have a single hole at the bottom of the dispenser; preferably in its undersurface as it is suspended in use.

If, however, the soluble material is of limited or controllable solubility, holes or mesh may be in the upper part of the body, so that most or all of the soluble material is exposed to liquid in operation.

The action of the dispenser may be aided by the expansion and contraction of the air inside the body which occurs when hot and cold water respectively pass over the body surface. As cold water passes over the body the air inside contracts and water is drawn inside. Conversely when hot water passes over the body the air inside is warmed, expands and forces liquid out of the hole. Thus the variation in temperature which would be encountered in many envisaged uses actually adds to the effectiveness of the dispenser.

The dispenser may have a removable cap, lid or plug at the top or bottom to allow replacement of the soluble material when necessary.

In order to support the dispenser in, for example, a drain-hole, it may be provided with hooks, projections or a suitably shaped body or cap. These

means engage on the perforate metal ring which is usually found in sink drain holes.

The invention is primarily intended for use in domestic drains of sinks, and the like, the body containing e.g. bleach or other disinfectant and/or perfume. The use may be extended to outdoor drains which may become particularly unpleasant. Another possibility is to include an insecticide. It would be possible also to extend the use to the treatment of industrial effluent by appropriate choice of materials for the body and contents of the dispenser.

Embodiments of the invention will now be described with reference to the accompanying drawings in which Figure 1 shows a cross section through a dispenser, being a first embodiment of the invention, and a drain hole, while Figures 2 to 5 show cross-sections through other dispenser bodies according to the invention the soluble material being omitted for clarity.

A dispenser 1 is fabricated in a plastics material such as polyethylene, which provides a cheap, water impermeable container in the form of an elongate hollow body permanently sealed at one end 2 by a plug. Most domestic drain holes have a perforate metal ring 3 in the mouth of the drain hole 4, offering a central orifice. The dispenser 1 has a diameter such that it fits within the perforations, preferably the central orifice of the ring 3, and is held in position by means of a flange 5 at one end portion. Appropriate dimensions

for a dispenser 1 for domestic use are 60 mm long and 8 mm wide, the flanges extending 3 mm beyond the outside surface of the body.

In the interior of the body is a solid disinfectant 6 or other appropriate material, which may be of tablet, powder, extruded or other form. Trichloroisocyanuric acid tablets, for example, may be used.

When water is released into the drain a portion of it passes along the outer surface 7 of the body and is drawn by adhesive forces along the undersurface of the lower end 8. In the embodiment of Fig. 1 this lower end 8 is flat but it could equally have a curved conformation.

When water reaches a hole 9 in the lower end 8 of the dispenser 1, it is drawn inside by surface tension effects and some of the solid 6 in the region of the hole 9 is dissolved; the solution passes out of the body under the action of gravity to form a drop 10 which subsequently falls into the U-bend (not shown) of the drain pipe where disinfection is effected. The holes in the dispenser should preferably be no bigger than will allow water to pass in by surface tension (capillary) action. A suitable maximum size for a single hole is about 3 mm.

Additionally water may be drawn into the body by suction as cold water passes over it and the air inside contracts. When hot water is emptied down the drain the air expands and forces disinfectant out of the dispenser 1.

Figure 2 shows a second embodiment similar in

most respects to that of Figure 1, but having a removable cap or plug 11 enabling replacement of soluble material. The plug 11 has a part 11a wider than the rest of the dispenser 1, so replacing the flange 5 of the first embodiment. The plug 11 may be clip fitted to the dispenser to permit its removal, and hence refilling of the dispenser 1.

The embodiment of Figure 3 has a plurality of holes 12 around its lower part. In this embodiment it would be possible for the disinfectant to be in tablet form so that only the bottom tablet would be dissolved by the water. The total number and size of the holes will depend on the volume, frequency and temperature of the anticipated water flow and on the solubility of the disinfectant where the disinfectant is of high solubility the dispenser is provided with small holes; when the dispenser is to be used in outdoor drains for example the holes will be relatively large and numerous.

Figure 4 illustrates the possibility of having the plug or cap 11 at the lower end of the dispenser 1, with a hole or holes 9, clear of the plug.

Figure 5 shows an embodiment in which a cage of mesh 13 takes the place of separate holes.

Figures 4 and 5 also illustrate that in some embodiments the dispenser 1 may be held in the ring 3 by means of a flare 14 at its upper end.

In another embodiment, also not illustrated, the dispenser may have one or a few holes near its top,

so that water entering percolates through the column of disinfectant. By suitable selection of the size of the upper hole(s) the amount of water entering the dispenser 1 may be regulated and so excessive leaching may be avoided. This method is most suitable where the soluble material to be leached is of low solubility.

CLAIMS:

1. Dispenser (1) for soluble materials comprising a hollow elongate body in impermeable material and solid soluble material (6) enclosed within the body, having means for suspending the dispenser (1) at its position of use with one end uppermost and its other end lowermost and having at least one hole in the body the total cross sectional area of the hole(s) (9,12,13) being small relative to the total outer surface area of the body.

2. Dispenser (1) according to claim 1 wherein the hole(s) (9,12,13) are adapted to allow liquid to be drawn inside the dispenser (1) by surface tension.

3. Dispenser (1) according to claim 1 or claim 2 wherein the hole(s) (9,12,13) are located at the end (8) of the body lowermost in use.

4. Dispenser (1) according to any one of the preceding claims wherein the body is substantially cylindrical and wherein the suspending means is a flange (5,11a) at the end portion of the body uppermost in use.

5. Dispenser (1) according to claim 4 wherein the flange (11a) is on a removable stopper (11).

6. Dispenser (1) according to any one of claims 1 to 4 wherein the lowermost end (8) of the body is closed by a removable stopper (11), the at least one hole (9) being in that lowermost end (8) portion.

7. Dispenser (1) according to any one of the preceding claims wherein the or each hole (9,12) is circular and has a diameter not exceeding 3 mm.

8. **Dispenser** (1) according to any one of the preceding **claims wherein the end** (8) portion of the body lowermost in **use includes the only hole or holes** (9) in the body and it **or they face downwardly.**

9. **A dispenser** (1) suspended in a sink drain hole (4) so **as to be bathed in waste water passing down the drain** hole (4), the dispenser (1) having suspending means (5,11a,14) to engage the drain hole (4), a hollow cylindrical body suspended generally parallel to the axis of the drain hole (4), the upper (2) and lower ends (8) of the body being closed off by end walls except for a hole (9) in the lower end (8) wall extending generally parallel to the axis of the drain hole (4) and a solid water-soluble water-treatment material (6) within the cylindrical body whereby the waste-water may enter the body through the hole (9) by surface-tension to dissolve and release as a solution (10) into the drain hole (4) a minor portion of the water-treatment material (6).

Fig.1.

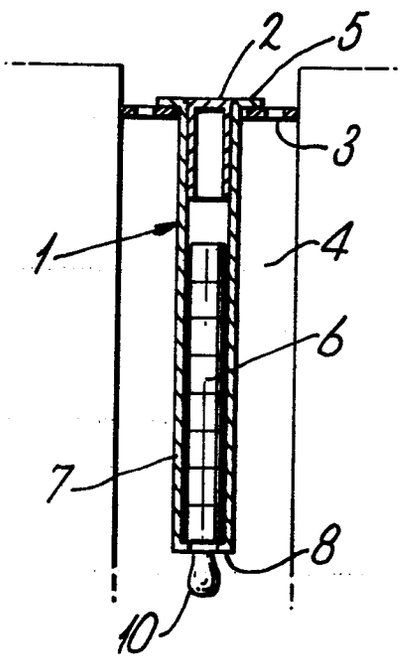

Fig.2.

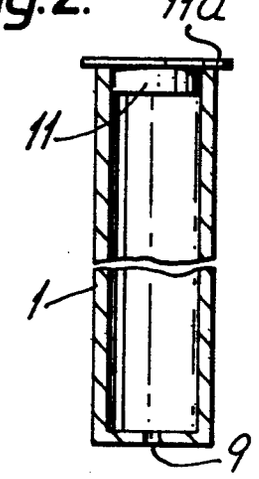

Fig.3.

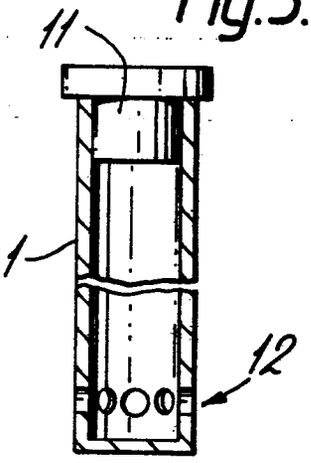

Fig.4.

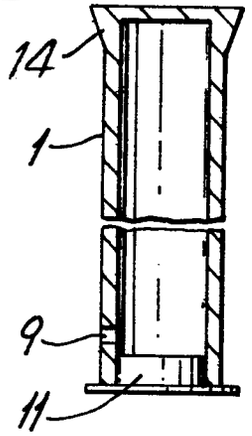

Fig.5.