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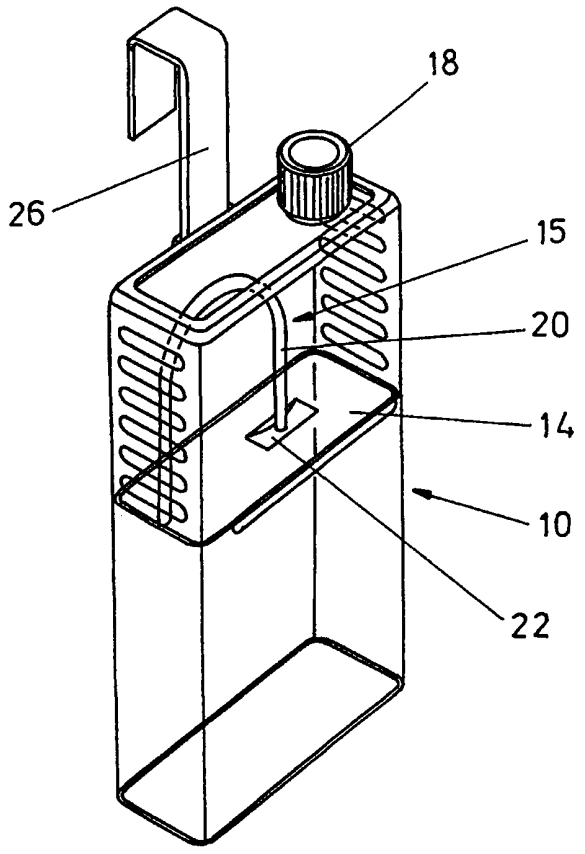
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(54) Title: DISPENSER DEVICE FOR A WATER CLOSET

(57) Abstract

A dispensing device for use within the flush cistern of a water closet comprises a container (10) having a compartment (15) filled with a liquid to be dispensed, this compartment having an opening (via a duct 20) through which a dose of the liquid is dispensed by means of suction created as the water level in the cistern falls upon actuation of the latter.



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Dispenser device for a water closet

The present invention relates to a device for dispensing a liquid, particularly but not solely a coloured sanitising liquid, into a water closet.

A number of devices have been proposed hitherto for adding a coloured sanitising substance to the water in a water closet. These are generally in the form of a block which is suspended in the water held in the syphon-action cistern of the water closet: the block progressively dissolves but the dose which it supplies varies very considerably according to the length of time between successive flushes of the cistern.

I have now devised a device which provides a substantially constant dose to the water in the cistern, independently of the length of time between successive flushes.

In accordance with the present invention, there is provided a dispensing device for positioning within a flush cistern of a water closet, the device comprising a container which is divided by an internal partition to form an upper compartment and a lower suction chamber, said upper compartment being filled with a liquid to be dispensed and having a discharge opening communicating with said suction chamber and said container having an outlet in or adjacent its bottom and communicating with said suction chamber, the arrangement being such that a dose of said liquid is dispensed through said outlet of the container via said discharge opening upon the cistern being actuated to flush the associated water closet.

Preferably the device is arranged so that, as the water level in the cistern falls upon actuation, suction is temporarily applied to the discharge opening via the suction chamber, so drawing a dose of the liquid out of the container.

The space available within a flush cistern, particularly of the syphon-action type, is generally very limited. However, the device in accordance with the present invention is preferably relatively tall and of relatively small cross-sectional size, so that it can be accommodated in upright manner within the cistern: such an arrangement is facilitated by the liquid-filled compartment being positioned above the

suction chamber.

Preferably the container is of uniform cross-sectional size and shape over its height. Conveniently, the container may be of rectangular cross-section.

Preferably the container is formed with an open bottom which provides its outlet. Preferably the outlet corresponds in area to substantially the entire area of the bottom of the container.

With a relatively large outlet to the container, it is ensured that the dispensed dose of liquid mixes well into the water. Thus, as the water level in the cistern drops below the bottom of the container, the water remaining within the suction chamber falls suddenly: the resulting agitation or turbulence promotes an effective mixing of the dispensed dose of liquid into the water.

Preferably the discharge opening communicates with one end of a duct, the opposite end of which terminates within and adjacent the bottom of the upper, liquid-filled compartment. Preferably the bottom of this compartment is shaped or configured such that the free end of the duct terminates at a level below the discharge opening of the liquid-filled compartment, when the device is installed in an upright position within the cistern: accordingly, the risk is prevented that the duct may act as a syphon and empty the liquid-filled compartment all at once.

Preferably the upper compartment is provided with means permitting the entry of air to replace the dispensed dose of liquid, but inhibiting any loss of said liquid.

An embodiment of the present invention will now be described by way of example only and with reference to the accompanying drawings, in which:

FIGURE 1 is an isometric view of a dispensing device in accordance with the present invention;

FIGURE 2 is a side view of the dispensing device;

FIGURE 3 is a front view of the dispensing device;

FIGURE 4 is a view of the cistern of a water closet, shown with its lid removed, into which the dispensing device of Figures 1 to 3 is fitted;

FIGURE 5 is an enlarged view of the portion of the

cistern in which the dispensing device is located; and

FIGURE 6 is a series of three diagrams to illustrate the sequence of operation of the dispensing device.

Referring to Figures 1 to 3 of the drawings, there is shown a dispensing device which comprises a generally rectangular container 10 which has an open bottom 12 but is closed off, intermediate its top and bottom, by a partition 14 to define a closed compartment 15 above an open-bottomed chamber 17. The top of the container 10 is formed with a projecting, tubular neck 16 which is externally screw-threaded and receives a closure cap 18. An inverted U-shaped tube 20 of fine bore is mounted within the closed compartment 15: one end of the tube 20 is attached to the partition 14 and registers with a hole in the latter; the other end of the tube 20 terminates close to the floor of a localised depression 22 which is formed in the partition 14.

As shown in Figure 2, the rear face of the container 10 may be provided with a suction member 24 to enable the device to be attached to the inner surface of the cistern of a water closet. Additionally or instead, the device may be provided with a strip 26 extending upwardly from a fixing point on the rear of the container 10, the strip 26 being capable of being bent, as shown, to form a hanger to hook over the rim of the cistern. Because the container 10 has a height substantially greater than its maximum width, it can be fitted conveniently into a cistern, where space is usually very limited.

Referring to Figures 4 and 5, the dispensing device is positioned within the flush cistern 30 of a water closet, against the inner surface of a side wall of the cistern (shown here as a syphon-action cistern). The compartment 15 of the device has been pre-filled, through its neck 16, with a sanitising liquid (preferably coloured): the closure cap 18 provides a seal to prevent escape of the liquid during transport, but is now loosened or even removed to allow air to enter and leave the compartment 15 in use of cistern; alternatively, the closure cap 18 may be of the "breathable" type which allows air to enter and leave but prevents liquid from escaping.

Referring to Figure 6, diagram (a) shows the water W at

an initial level within the cistern. When the cistern is flushed, the level of water W falls as shown in diagram (b): when the water level is below the bottom of the compartment 15, the pressure on the water-filled bottom section or chamber 17 of the container 10 is lower than the pressure within the compartment 15, so that a dose of the coloured sanitising liquid is drawn out of this compartment through the tube 20. Once the level of water W in the cistern falls below the open bottom of the container, as shown in diagram (C), air is able to enter and fill the bottom chamber of the container 10: in particular, the water remaining within the chamber 17 suddenly drops out, creating substantial agitation or turbulence which causes the dispensed dose of liquid to mix well into the water. Because the free end of the tube 20 is accommodated by the depression 22 in the partition 14 of the container, and is therefore lower than the opposite or discharge end of the tube, then the creation of a syphon effect (which would empty the compartment 15) is avoided. When the cistern refills with water, air is expelled from the bottom chamber 17 of the container via the tube 20, the air bubbling upwards through the liquid in the compartment 15 and through the neck 16.

Although Figure 6a shows the device positioned with the bottom of its fluid-filled compartment 15 just above the normal water level, in practice the normal water level may be at any level between the bottom of the compartment 15 and the top of the tube 20: preferably however, the water level is significantly above the bottom of the compartment 15 to provide a small head of pressure to overcome the resistance to back-flow of air through the tube 20.

It will be appreciated that the device which has been disclosed acts to dispense a more or less constant volume of the sanitising or other liquid each time that the cistern is flushed. Accordingly, the dose which is delivered into the cistern, and therefore flushed into the toilet bowl, is independent on the interval of time between successive flushes.

Claims

1) A dispensing device for positioning within a flush cistern of a water closet, the device comprising a container which is divided by an internal partition to form an upper compartment and a lower suction chamber, said upper compartment being filled with a liquid to be dispensed and having a discharge opening communicating with said suction chamber and said container having an outlet in or adjacent its bottom and communicating with said suction chamber, the arrangement being such that a dose of said liquid is dispensed through said outlet of the container via said discharge opening upon the cistern being actuated to flush the associated water closet.

2) A dispensing device as claimed in claim 1, arranged so that, as the water level in the cistern falls upon actuation of the latter, suction is applied temporarily to said discharge opening via said suction chamber, so drawing a dose of said liquid out of the container.

3) A dispensing device as claimed in any preceding claim, in which said discharge opening communicates with one end of a duct, the opposite end of which terminates within said upper compartment adjacent the bottom thereof.

4) A dispensing device as claimed in claim 3, in which said opposite end of said duct terminates at a level which is, in use of the device, below said discharge opening.

5) A dispensing device as claimed in claim 3 or 4, in which said duct is provided by an inverted, generally U-shaped tube disposed within said upper compartment.

6) A dispensing device as claimed in any preceding claim, in which said container is of generally uniform cross-sectional size.

7) A dispensing device as claimed in any preceding claim, in which said container has a height substantially greater than

its maximum width.

8) A dispensing device as claimed in claim 7, in which said container has a rectangular cross-section.

9) A dispensing device as claimed in any preceding claim, in which said container is formed with an open bottom to provide said outlet.

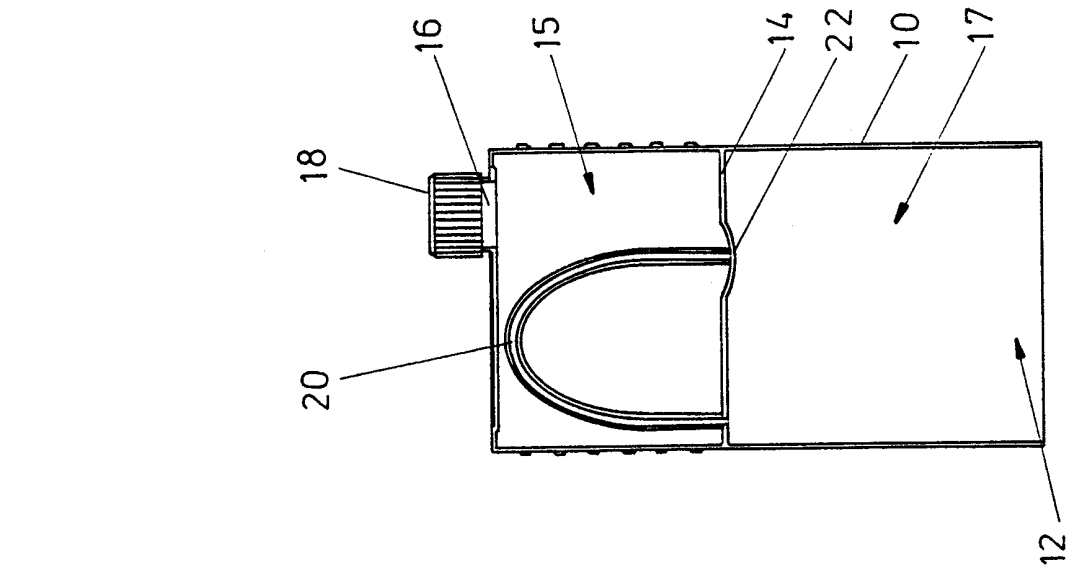


FIG. 3

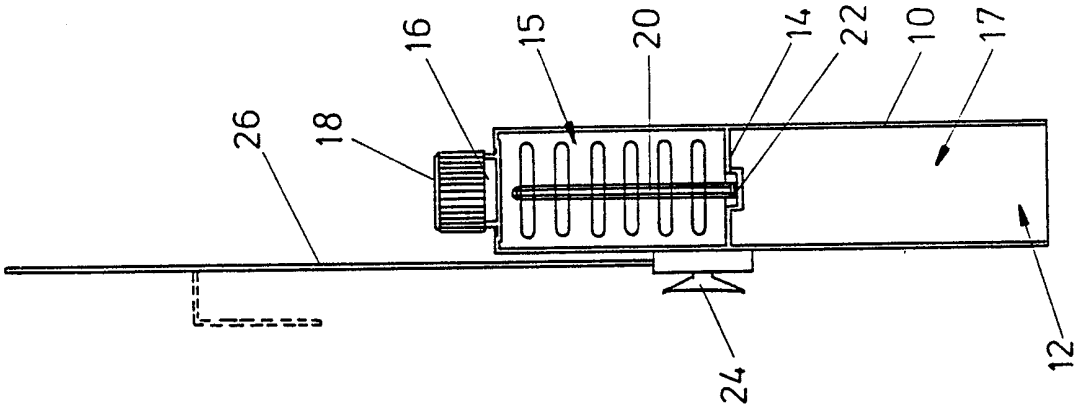


FIG. 2

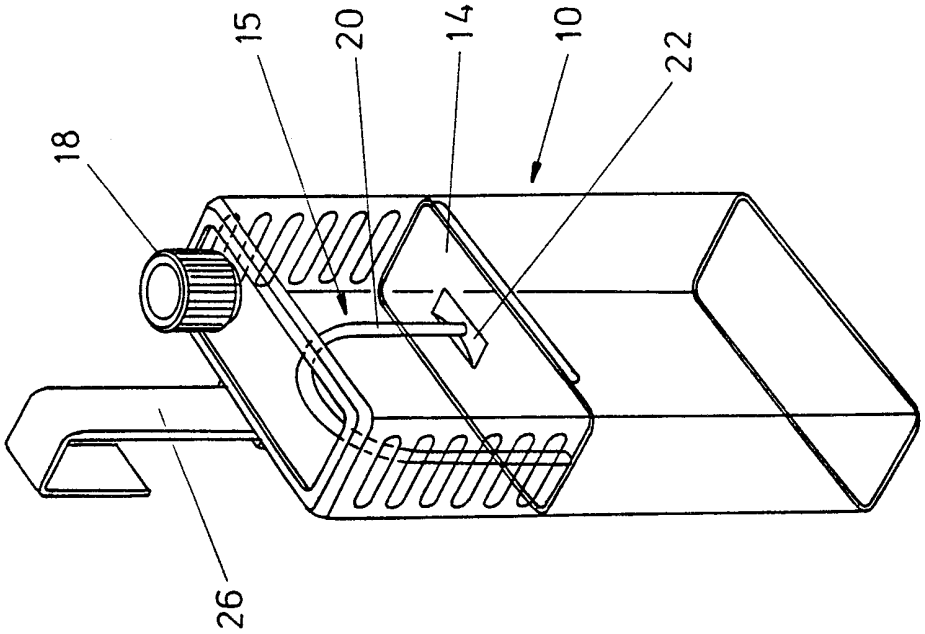


FIG. 1

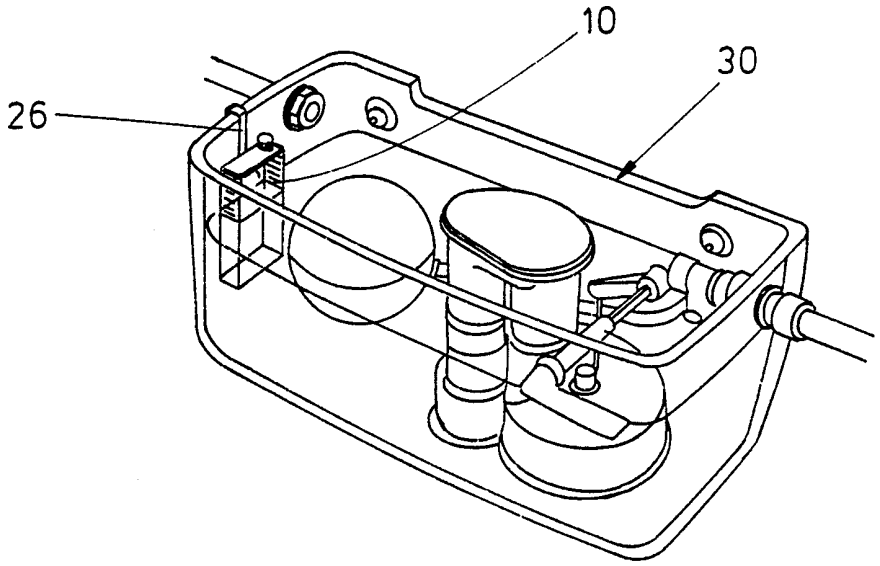


FIG. 4

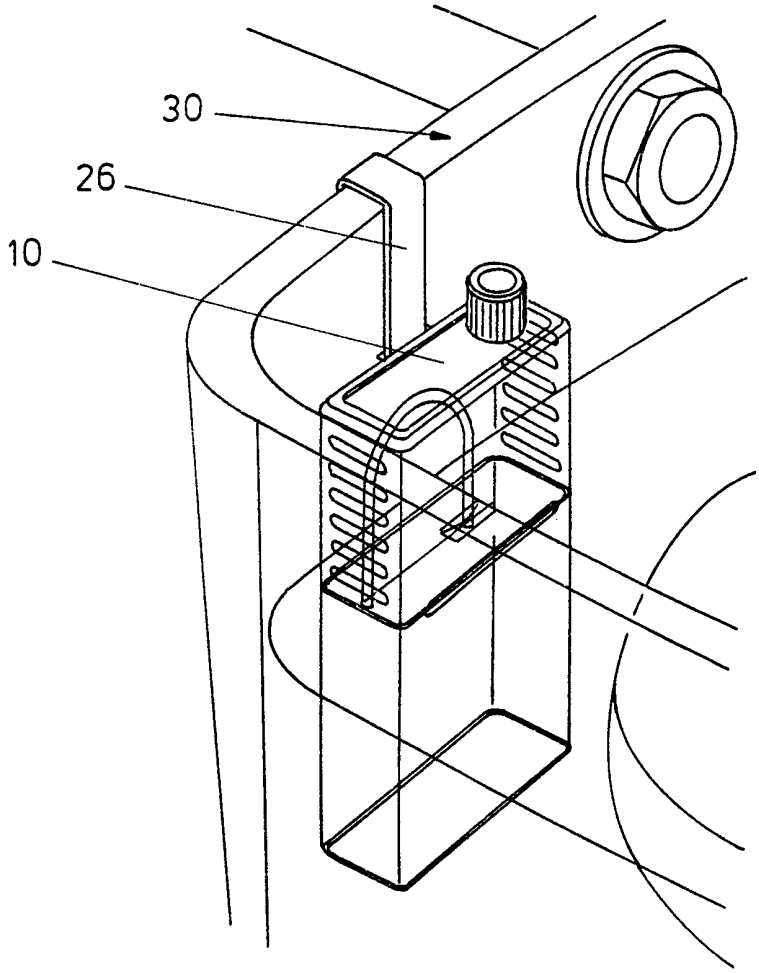
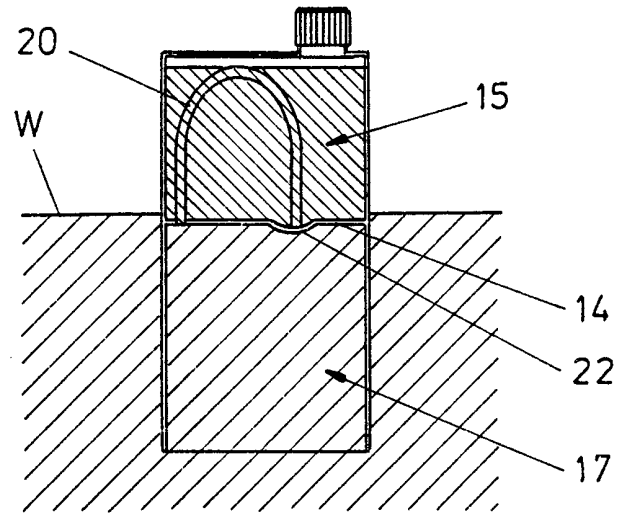
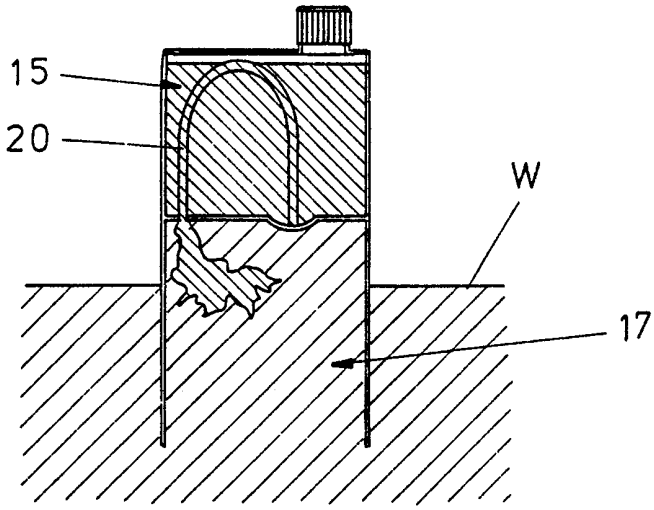


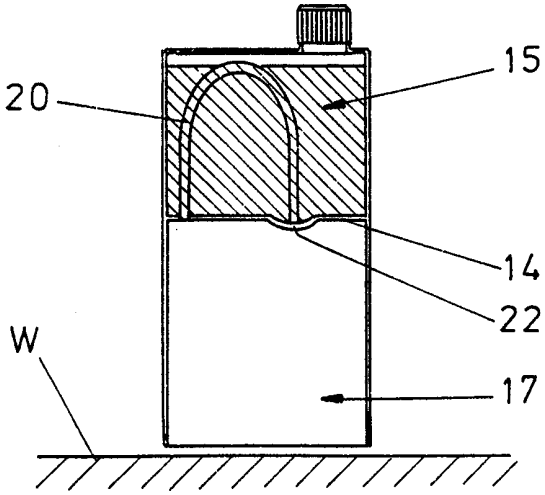
FIG. 5



(a)



(b)



(c)

FIG. 6

INTERNATIONAL SEARCH REPORT

Interi ıal Application No
PCT/GB 98/03493

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 E03D9/03

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 212 089 A (LINDAUER) 15 July 1980 see column 10, line 28 - column 11, line 60; figures 1-5	1,2
X	EP 0 004 990 A (PROTECTER & GAMBLE) 31 October 1979 see figures 1-8	1,2
A	US 2 688 754 A (WILLITS) 14 September 1954 see the whole document	1
A	US 3 895 739 A (DEAN22.07.75) 22 July 1975 see figure 5	3

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☒ Patent family members are listed in annex.

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