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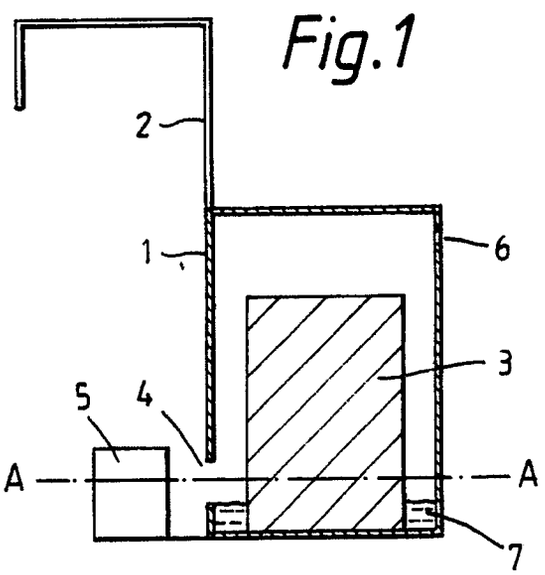
(54) Delayed release dispenser.

(57) Dispensing system for delivering amounts of a chemical product to a discontinuous stream of a fluid such as water, comprising a substantially closed container for holding the chemical product and fastening means for holding the container in place, said container having an opening both for receiving the stream of the fluid and for allowing it to flow out again after a delay, said system being free of any moving parts. The system may be used in toilet bowls as well as in spray-cleaning machines.

Fig.1



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DELAYED RELEASE DISPENSER

The present invention relates to a dispenser. More in particular, it relates to a delayed release dispensing system for delivering amounts of a chemical product to a discontinuous stream of a fluid, such as the flush water in a toilet. The chemicals to be delivered by the dispenser may be cleansing agents, sanitizing agents, deodorants and the like.

Lavatory rim block dispensing devices are known in the art. They may, for instance, comprise a cage-like container with holes and a hook for mounting inside the toilet bowl. Inside the container there is a solid block of a sparingly soluble cleansing agent, which is continuously delivered to the flush water for the duration of the flush.

When such cage-like containers are used, most of the delivered cleansing agent does not remain in the bowl to fulfil its cleansing purposes but is directly flushed into the sewage system. This inefficiency constitutes an economical disadvantage and is environmentally undesirable there being a growing tendency from an environmental point of view to reduce the amount of chemicals which are fed into the sewage system. Moreover, it is often difficult to attain an effective level of the chemical in the toilet bowl because the block of chemical is sparingly soluble and delivery only takes place during the relatively short period of the flush.

It has therefore been proposed to provide a time-delay to the in-bowl dispensing systems, such that the greater part of the chemical is only added to the last part of the flush water, most of which remains in the bowl after the flush.

For instance, the European patent application 92,283 (Unilever) describes a cage-like toilet bowl dispenser which is equipped with a siphon system in order to achieve a time delay during the flush cycle. Although such a dispenser functions satisfactorily in that some of the dissolved chemical is delivered at the end of the flush, the efficiency is still low. Furthermore, drip stains are sometimes observed and the cost of manufacturing is high due to the complexity of the siphon system.

The international patent application WO-83/01974 (Wellcome) discloses a liquid dispensing system for connecting to a flushing-water pipe, comprising a connecting pipe and a casing having therein a chamber and a float-operated valve, whereby a predetermined amount of a liquid product is dispensed into the chamber when the chamber is flooded with flush water.

It is an object of the present invention to provide an improved delayed release dispensing system which obviates the above-mentioned disadvantages. Above all, it should effectively provide a time delay such that the chemicals are used more efficiently and at the same time the system should be easy and economical to manufacture.

We have now found that these and other objects can be achieved by the delayed release dispensing system of the present invention which comprises a substantially closed container for holding the chemical product and fastening means for mounting the container, said container having an opening both for receiving the stream of a fluid, such as water, and for allowing it to flow out again after a delay, said system being free of any moving parts.

Preferably, there are provided means to direct the stream of the fluid to the opening in the container.

It is advantageous in the dispensing system according to the invention if the opening is placed above the lowest point of the container, such that some of the fluid is retained inside the container after the stream of the fluid has ceased.

Preferably, there are provided one or more further openings in the upper part of the container for equalizing the air pressure in and outside the container when the container is being filled with the fluid.

It is especially preferred when the opening in the container for letting the fluid in and out is non-wetting to the fluid to reduce dripping. For use with aqueous liquids, the openings may have a hydrophobic finish to reduce dripping. Alternatively, the entire container may be made from an hydrophobic material or an hydrophobic insert may be introduced in the openings. Suitable materials for these purposes include for instance poly tetrafluoro ethylene (teflon) and silicone resins.

The dispensing system according to the invention may be used as a toilet bowl dispensing system. In that case, the fluid is water and there are provided fastening means to mount the container inside a toilet bowl. It is preferred when there are also provided means to lock the dispensing system in place under the rim of the toilet bowl. For example, a pin may be provided which fits into a hole under the rim.

Preferably, there is provided a secondary support inside the container to cradle the block of chemical. The dispenser of the invention may further comprise one or more additional compartments which are open to the atmosphere, and which are designed to deliver volatile components such as perfume, from a suitable impregnated pad, a chemical block or gel.

The dispensing system according to the invention may also be used inside spray-cleaning ma-

chines such as dish washing machines, more in particular in industrial ware washing machines. In that case, the dispenser comprises a deflector funnel to direct the water to the opening in the container.

According to a further embodiment of the invention, the dispensing system may be attached to the end of pipes and taps. In that case it comprises a suitable clamping device and a deflector to direct the fluid into the container.

The invention will now be further illustrated by means of the following specific descriptions, in which:

Figure 1 is a schematic cross-section through a toilet bowl dispensing system according to the invention.

Figure 2 is a schematic projection of the toilet bowl dispensing system shown in figure 1 along the line A-A.

Figure 3 is a schematic perspective view of a dispensing system according to the invention for use in a mechanical ware washing machine.

Figure 4 is a schematic perspective view of a dispensing system according to the invention attached to a pipe or tap.

Figure 5 is a schematic perspective view of a dispensing system according to the invention for use in the sink on top of a Japanese type of toilet.

Figure 1 is a cross-section through a toilet bowl dispensing system showing a substantially closed container 1 to be held close to the flush water channel by an appropriate hanger 2 which fits onto the toilet rim. Inside the container 1 there is a block of a sparingly soluble chemical 3, suitable for cleaning and sanitizing a toilet bowl. Such blocks are known in the art. Furthermore, the container 1 possesses a hole 4 allowing the flush water which may be taken from the flush stream by a deflector 5 to enter the container 1. Near the end of the flush the pressure of the water flow into the container 1 decreases and is finally reduced to zero. The water inside the container which has been in contact with the block of chemical for some time now flows back through the opening 4 into the toilet bowl. Through the optional holes 6 at the top of the device air may escape during the filling phase, thereby allowing more water to enter the container. The air may be perfumed so that a perfume is dispensed during the early stages of flushing the toilet. In a depicted preferred embodiment a sump 7 is formed because the opening 4 is situated above the lowest point of the container 1. A small volume of water is retained in this sump, dissolving some of the chemical to form a solution ready for the next flush.

Although in the depicted situation there is only one container 1, it can also be envisaged that there are provided more containers, each containing a separate type of chemical. This is especially useful when several mutually incompatible chemicals have to be dispensed.

In figure 2 a schematical projection of the device of figure 1 is shown along the line A-A. It shows a wedge-shaped part 5 to direct the flow of flush water to the opening 4 in the container 1.

Figure 3 shows a dispensing system according to the invention for use in a mechanical ware washing machine. The discontinuous stream of water originates from the rotating spray arms or a shower head. The device comprises a substantially closed container 10 holding a sparingly soluble block of chemical 13, which is in this case a caustic detergent composition. By means of the fastening means 12 for mounting the container, the device is positioned inside the machine to receive water from the shower head. The container has an opening 14 allowing the spray water caught in the deflector funnel 15 to enter the container rapidly to contact the block of chemical. The entry of the spray water is facilitated by the small opening 16 for equalizing the pressure inside and outside the container. When the funnel water back pressure is reduced near the end of the spraying, a solution of the chemical flows back from the opening 14 via opening 18 into the interior of the machine. In the shown preferred embodiment of the invention, the opening 14 is positioned above the lowest point of the container 10 such that a residual amount of water is left in sump 17 to dissolve some of the chemical for the next spraying cycle.

Figure 4 shows a dispensing system according to the invention for use on an inlet pipe or tap. The discontinuous stream of fluid indicated by the arrows originates from a pipe or tap 21. The device comprises a substantially closed cylindrical container 20 holding one or more blocks of a chemical 23. The device is held at the end of a pipe 21 by means of fastening means 22, such that liquid may flow through the device. The container 20 has an opening 24 allowing liquid to enter until it is filled or until the back pressure stops the entry of further liquid. The liquid is directed towards the opening 24 by the deflection means 25. When the liquid pressure is reduced, for example when the tap is closed, the liquid containing the chemical flows from the container through opening 24 and down the pipe. In the shown embodiment the opening 24 is positioned above the lowest point of the container such that a residual amount of liquid is left to dissolve some of the chemical 23 for the next time liquid is drawn from the pipe.

Figure 5 shows a dispensing system according to the invention for use in the sink which can be found on top of a Japanese-type toilet. The water used to wash the hands is thereby collected in a

tank and used subsequently to flush the toilet. The device according to the invention is placed onto the drain of the sink and is thus used to deliver an amount of cleaning or sanitizing agent to the flush water in the toilet. The device shown in Figure 5 comprises a substantially closed container 26 having therein a block of a sparingly soluble chemical 27, suitable for cleaning and sanitizing a toilet bowl. As said before, such blocks are known in the art. The device also possesses fastening means in the form of two hooks 28 to keep it in place onto the drain of the sink. The upwardly curved edge 29 of the device causes the water falling from the tap to enter the container via hole 30. When the tap is closed and there is no longer water dropping onto the device, the pressure of the water flow into the container decreases and is finally reduced to zero. The water inside the container which has been in contact with the block of chemical for some time now flows back through the opening 30 onto the edge 29. This edge comprises a number of small holes 31 which allow the water to flow down the drain of the sink into the tank, where it is kept until the toilet is flushed again.

Claims

1. Dispensing system for delivering amounts of a chemical product to a discontinuous stream of a fluid, comprising a substantially closed container (1) for holding the chemical product (3) and fastening means (2) for holding the container in place, said container having an opening (4) both for receiving the stream of a fluid and for allowing it to flow out again after a delay, said system being free of any moving parts.
2. Dispensing system according to Claim 1, further comprising means (5) to direct the stream of fluid to the opening in the container.
3. Dispensing system according to Claims 1-2, wherein the opening (4) is placed above the lowest point of the container, such that some of the fluid is retained inside the container after the stream of fluid has ceased.
4. Dispensing system according to Claims 1-3, whereby there are provided one or more further openings (6) in the upper part of the container for equalizing the air pressure in and outside the container when the container is being filled with fluid.
5. Dispensing system according to Claims 1-4, whereby the opening (4) in the container is non-wetting to the fluid to reduce dripping.
6. Dispensing system according to Claim 5, whereby the opening (4) in the container has a hydrophobic finish to reduce dripping of an aqueous fluid.
7. Dispensing system according to Claims 1-6 for use inside a toilet bowl, comprising fastening means for mounting the container inside a toilet bowl.
8. Dispensing system according to Claim 7, further comprising means to lock the system in place under the rim of the toilet bowl.
9. Dispensing system according to Claim 2-6 for use in spray-cleaning machines, comprising a deflector funnel (15) to direct the water to the opening (14) in the container (10).
10. Dispensing system according to Claim 2-6 for use on the end of pipes and taps, comprising a suitable clamping device (22) and a deflector (25) to direct the fluid to the opening (24) in the container (20).

Fig.1

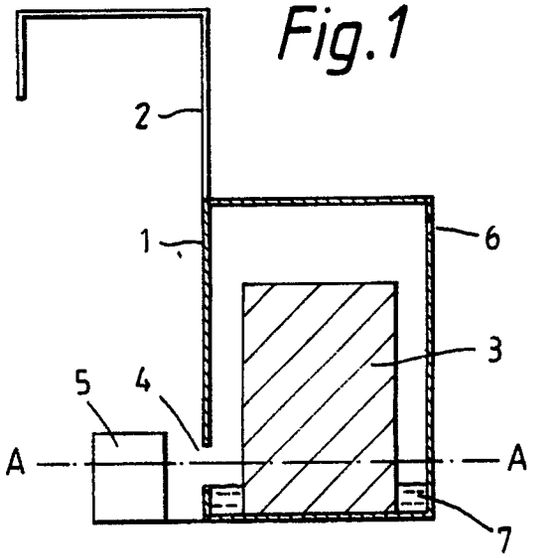


Fig.2

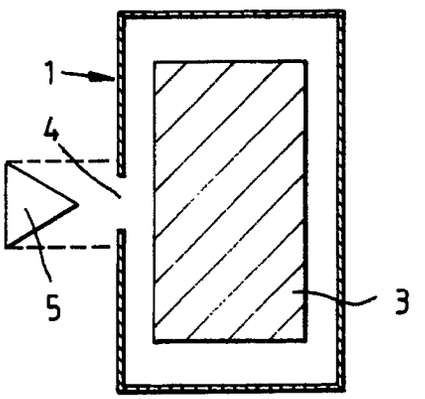
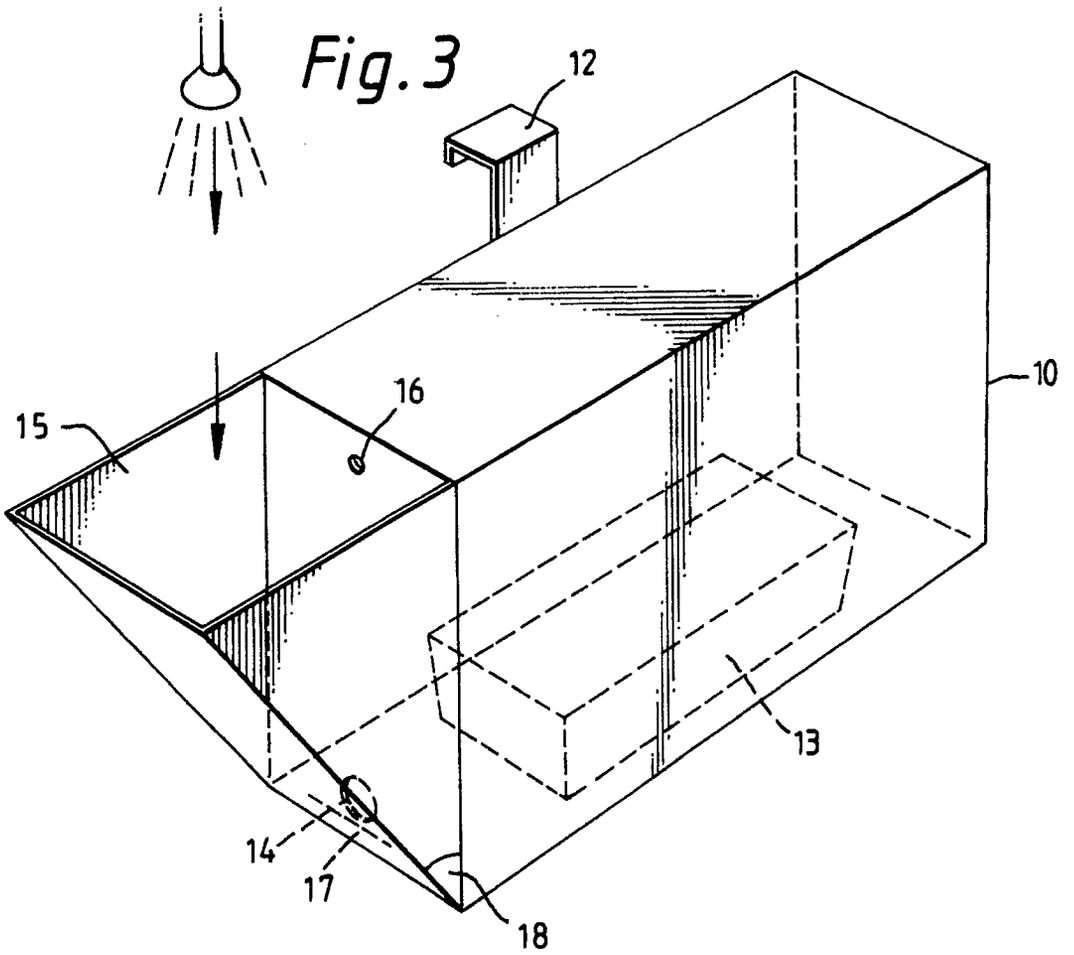


Fig.3



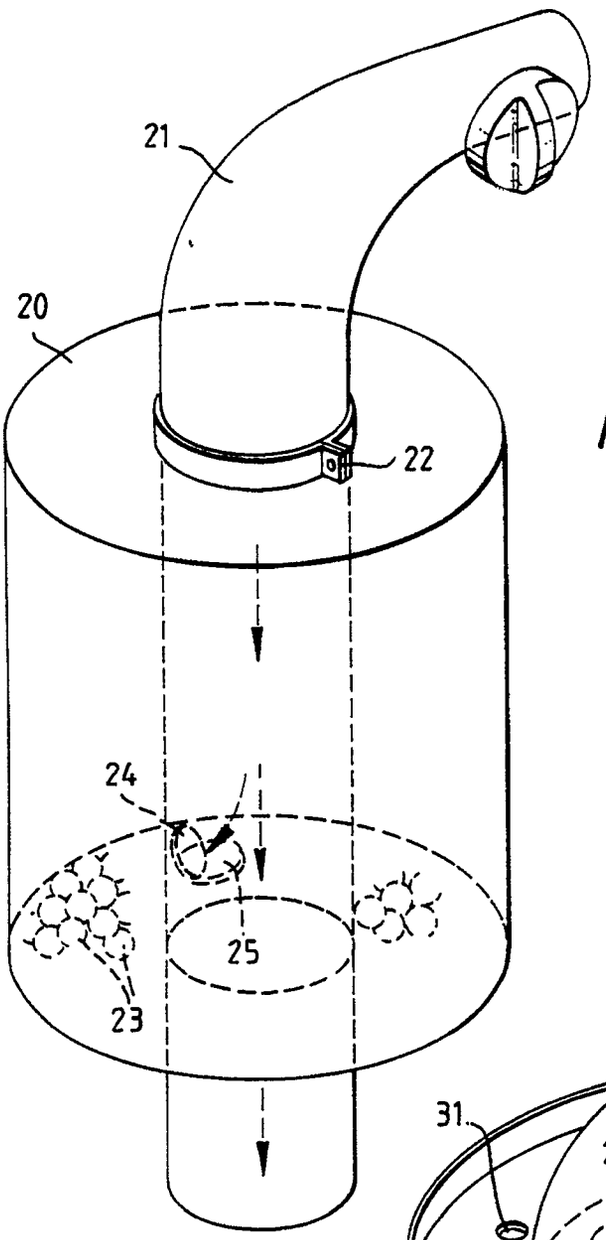


Fig. 4

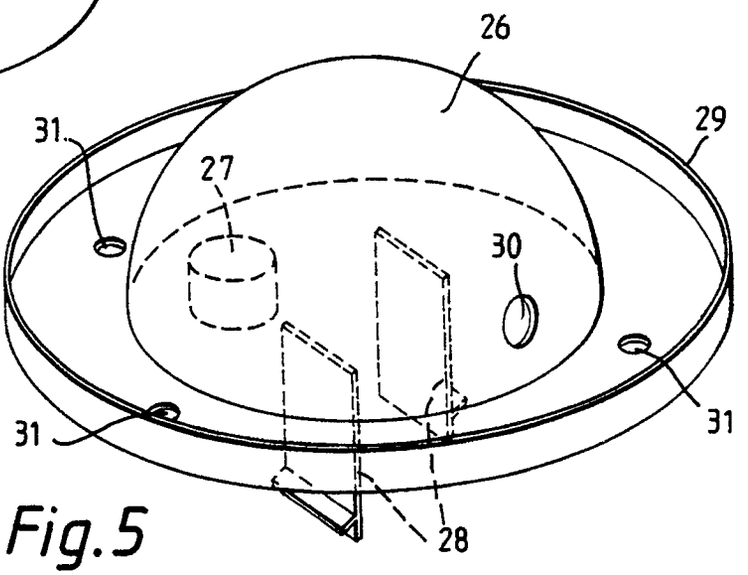


Fig. 5

European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 90201892.8

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	EP - A1 - 0 102 891 (RECKITT & COLMAN S.A.) * Fig. 1-8 * --	1,2	E 03 D 9/03 E 03 D 9/02 C 11 D 17/04
A	AT - B - 374 859 (L'OREAL) * Page 2, lines 18-26 * --	1	
A	EP - A1 - 0 268 945 (HENKEL) * Fig. 1-3 * ----	1	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

E 03 D
C 11 D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
VIENNA	23-10-1990	SEIRAFI

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
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E : earlier patent document, but published on, or after the filing date
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