

"Improved treatment liquid dispenser for water closets"

This invention concerns a metering dispenser of treatment liquid in water closets, and more particularly this invention concerns a device for the delivery of a determined amount of a bacteriostatic liquid agent at the time of flushing in such a way as to leave, after each operation, a bacteriologically "clean" unit for the next user.

The device according to the invention can advantageously be combined with a device delivering environmental deodorant by means of indirect positive activation with each operation.

According to this invention a device is foreseen associated with a dynamic liquid injector in a water-flush falling column associated with a valve device which allows the withdrawal, from time to time, of an amount of water precisely metered at the time of flushing by putting the said amount of water in communication with a liquid-liquid exchanger associated with a feed supplier from a container containing a bacteriostatic liquid or other treatment liquid.

The container, valve device and bottle of bacteriostatic liquid or other treatment liquid is designed in such a way that the movement of water into it induces an aspiration action such that a supplier of environmental deodorant is activated, the deodorant being impregnated onto felt or similar material able to contain a volatile liquid or solid.

According to one aspect of the present invention there is provided a dispensing device for administering a predetermined amount of treatment liquid into water closets, comprising a casing within which is a container-dispenser, co-operating with a chamber containing a float-operated valve, the container-dispenser being adapted to dispense a pre-determined amount of treatment liquid into the chamber when the chamber is flooded by a flow of

flushing water, the amount of flushing water being controlled by the float operated valve. In addition, a hydrodynamic unit may be provided in the flushing water pipe which is adapted to supply flooding to the said chambers.

According to a further aspect of the invention there is provided a method for administering a liquid to water closets which comprises dispensing the liquid from a device which consists of a casing within which is a treatment-liquid dispenser which co-operates with a chamber containing a float operated valve, the components of the device being arranged such that, at the beginning of a flushing cycle, flushing water floods the chamber to a level determined by the position of the float operated valve, the influx of flooding water releasing a predetermined amount of the treatment liquid from the dispenser into the chamber, which is expelled from the device along with the flushing water into the water closet, at the end of the flushing cycle.

In either of the aforementioned embodiments of the present invention, the chamber may be partitioned into a first and a second chamber, said first chamber containing the float-operated valve, and said second chamber co-operating with the container-dispenser, the arrangement of the chambers being such that flooding water may pass freely between the two chambers.

In a yet further aspect of the present invention, there is provided a method for administering a metered amount of deodorant into the atmosphere which comprises a dispensing device as hereinbefore defined, an aperture fitted to the casing of the device, and an environmental deodorant dispenser impregnated with a volatile liquid or solid, the components being arranged such that during a flushing cycle, air is displaced through said aperture and a metered amount of deodorant is expelled into the atmosphere.

This invention will now be described by reference to one of its forms of embodiment currently preferred, this being illustrative and not limiting, and based on the appended design diagrams in which:

Figures 1, 2 and 3 show schematically in perspective, lateral and plan views respectively, the design of a device according to this invention.

Figure 4 shows an even more schematic view of the device according to the invention in the resting position.

Figure 5 shows, in succession to Figure 4, a view of the device according to the invention in the refilling phase during a flushing operation.

Figure 6 shows a view analagous to that of Figure 5 in the phase of inflow of bacteriostatic liquid or other treatment liquid, and

Figure 7 shows, similarly to Figure 6, the discharge phase of the device according to the invention.

With reference to Figures 1 to 3, according to the invention the device comprises a casing 1 containing a tank 2 of treatment liquid, particularly a bacteriostatic liquid, an aspiration chamber 3 the flooding of which is controlled by a valve 4 associated with a float 5, and an exchange or dilution chamber 6 fed from tank 2 via a metering dispenser valve 7. The side of valve 4 turned towards the outside is connected by pipe 8 to the water flush falling column 9, which is forced through conduit 8 by means of a hydrodynamic dispenser device symbolized by the element 10.

Corresponding to the external part turned towards the outside of casing 1 is conveniently arranged a dispenser of enviromental deodorant 11 of the type comprising a felt unit or other similar material which dispenses a deodorant in accordance with the aspiration action induced by the displacement of liquid in chambers 3 and 6.

With reference to Figures 4-7, the functioning of the device according to this invention will now be described.

As shown in Figure 4, in the resting position the valve 4 is disposed against the seal present at the end of pipe 8, and the device is ready for operation.

With a flushing operation the tube 9 is traversed by a column of moving water, part of which is captured by element 10 of the hydrodynamic dispenser and is sent through pipe 8 so as to refill chamber 3 and raise the float 5 until the valve 4 blocks the subsequent flow of water by sealing against seating 4a. The water which reaches the aspiration chamber 3 passes through a passage (not illustrated) to reach the exchange or dilution chamber 6.



In chamber 6 is found the dispenser-metering valve associated with tank 2 of the treatment or bacteriostatic liquid, made as described in the US Patent 2,839,763 issued on 24th June 1958 in the name of W.G.Newson and entitled "Dispenser for flush tank deodorant bottle". The functioning and structure of the dispenser-metering valve shown in 7 is clearly described in detail in this US Patent publication, and a detailed description is not considered necessary here. It is enough to say that, with a siphon action movement, for each immersion of valve 7 a determined amount of bacteriostatic or other treatment liquid is delivered. The dispensing phase on the part of valve 7 is shown in Figure 6.

In Figure 7 is shown the end of the dispensing operation. In this phase the predominance of the water column traversing pipe 9 is in the final phase and there is no longer a hydraulic counter-pressure forcing valve 4 against seating 4a' and prohibiting the passage of water into chamber 3. Consequently, the predominance of the added treatment of bacteriostatic agent liquid present in chambers 3 and 6 prevails over the thrust of water in tube 9 and reaches the water closet unit.

It will be seen that concurrently with the actions described above there will be a displacement of air within the casing 1, whereby the deodorant dispenser element shown in Figure 1 will be subjected to a current of air which consequently releases a deodorant agent into the environment.

It will be seen that the solution according to this invention is particularly advantageous in that a calibrated dispensation of treatment agent, particularly a bacteriostatic agent, is produced without the use of external motor force save the almost gratuitous force supplied by the column of flushing water.

As an example, considering that container 2 can suitably be produced with a capacity of 600 ml and with a dispensation through metering valve 7 of 0.5 ml per flush, this content will suffice for 1200 flushes. Considering a mean use of 18 flushes per day, an operational time of 76 days or 9.2 weeks can be attained. With a mean of 20 flushes per day, the operational time will be about 8.5 weeks.

It should be noted that with the device according to the invention, since the dispensing of treatment liquid is made at the end of the flushing, the concentration of treatment liquid remaining in the stagnant water of the water closet will be much higher than that obtained in similar devices with dilution in the entire mass of flushing water.

CLAIMS:

1. A method for administering a liquid to water closets which comprises dispensing the liquid from a device which consists of a casing within which is a treatment liquid container-dispenser having a siphon valve which cooperates with a chamber containing a float operated valve, the components of the device being arranged such that, at the beginning of a flushing cycle, flushing water floods the chamber to a level determined by the position of the float-operated valve, the influx of flooding water releasing a pre-determined amount of the treatment liquid from the dispenser through the siphon valve into the chamber, which is expelled from the device along with the flushing water into the water closet, at the end of the flushing cycle.
2. A method for administering a liquid to water closets as defined in claim 1, wherein the chamber is partitioned into a first and a second chamber, said first chamber containing the float operated valve and said second chamber co-operating with the container-dispenser, the arrangement of the chambers being such that flooding water may pass freely between the two chambers.
3. A dispensing device for administering a pre-determined amount of treatment liquid into water closets, comprising a casing within which is a container-dispenser, co-operating with a chamber containing a float-operated valve, the container dispenser having a siphon valve through which can be dispersed a predetermined amount of treatment liquid into the chamber when the chamber is flooded by a flow of flushing water, the amount of flushing water being controlled by the float operated valve.
4. A dispensing device as claimed in claim 3, wherein the chamber is partitioned into a first and a second chamber, said first chamber containing the float-operated valve, and said second chamber co-operating with the container-dispenser, the arrangement of chambers being such that flooding water may pass freely between the two chambers.
5. A dispensing device as claimed in either of claims 3 or 4 which comprises, in addition, a hydrodynamic unit provided in the flushing-water pipe which is adapted to supply flooding water to said chambers.



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6. A method for administering a metered amount of deodorant into the atmosphere, which comprises a dispensing device as claimed in any of claims 3,4 or 5, an aperture fitted to the casing, and an enviromental deodorant dispenser impregnated with a volatile liquid or solid, the components being arranged such that during a flushing cycle air is displaced through said aperture, and a metered amount of deodorant is expelled into the atmosphere.
7. A dispensing device for treatment liquid for water closets substantially as illustrated and described by reference to the appended diagrams.
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