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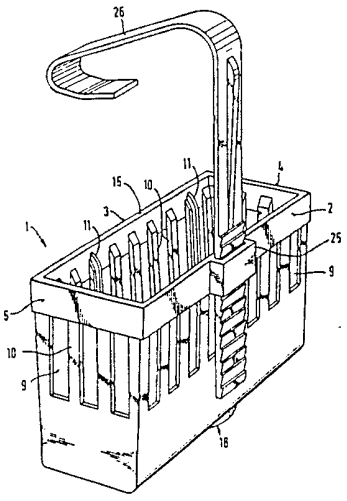
(54) **Toilet flush water coloriser dispenser**

(57) A toilet flush water coloriser dispenser comprises a container adapted for receiving therein a flush water coloring block and having at least one entry opening 9 for admitting flush water thereinto, and outlet means 18 for the discharge of coloured flush water from the container, the coloriser further comprising suspending means 25, 26 for suspending the container on the inside of a toilet bowl, and a diluting chamber 7 in the interior of the container adapted for collecting drops of colour concentrate dripping off a block after each flushing, the outlet means 18 being located in the bottom of the diluting chamber, and preferably comprising a siphoning device which after each flush, siphons off flush water from the diluting chamber down to a minimum sump level.

Fig.1



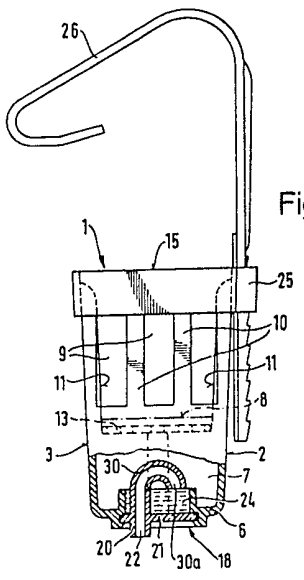


Fig.5

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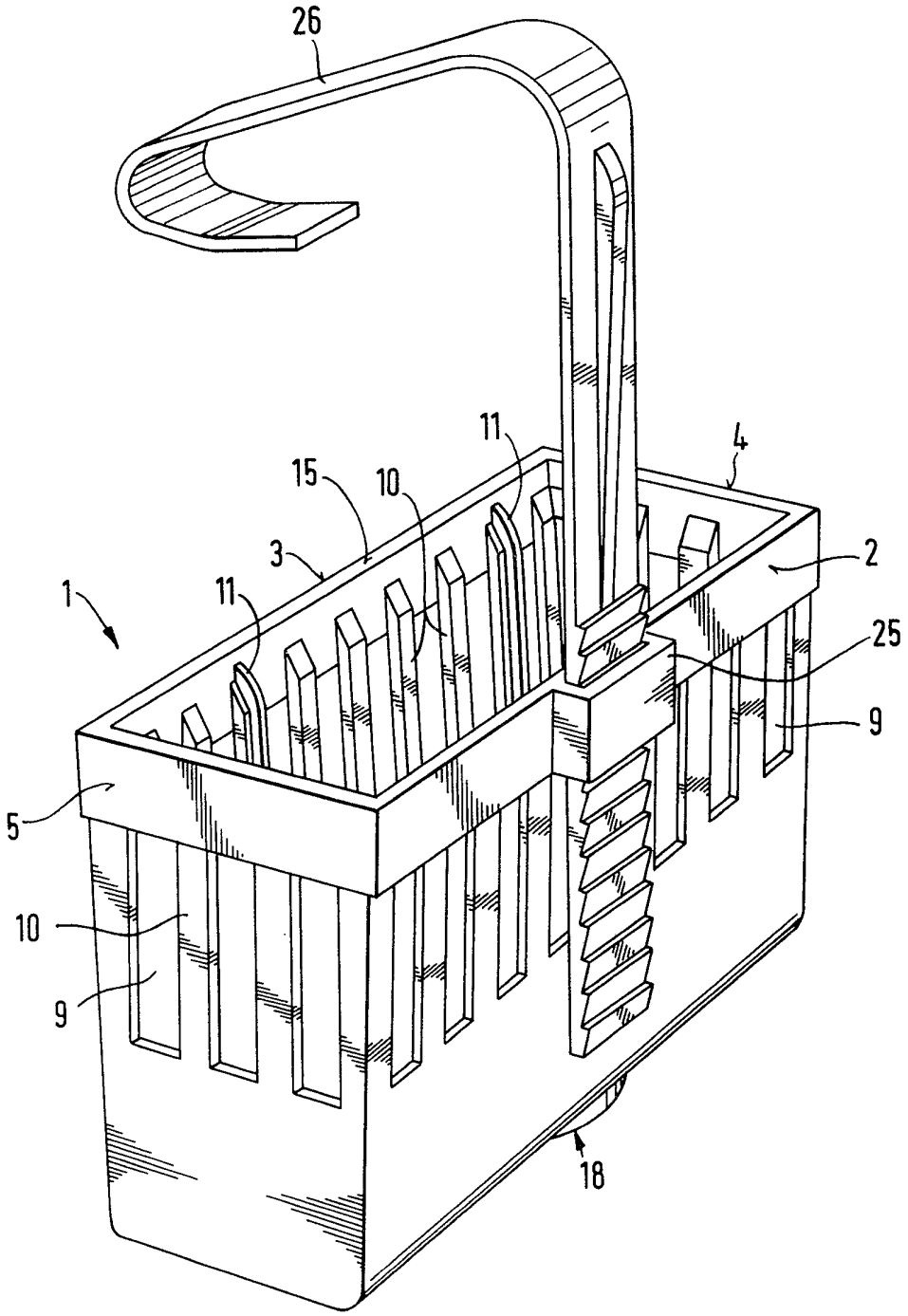
Fig.1



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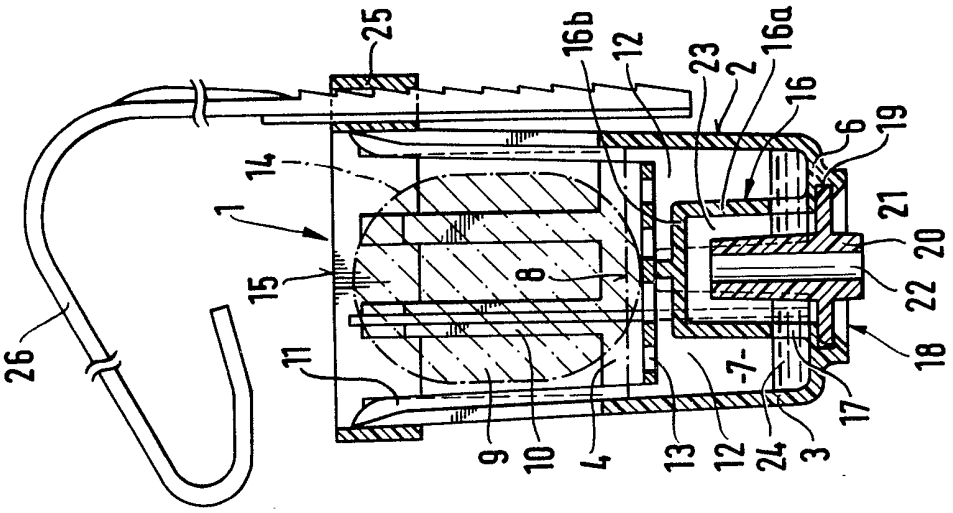

Fig.3

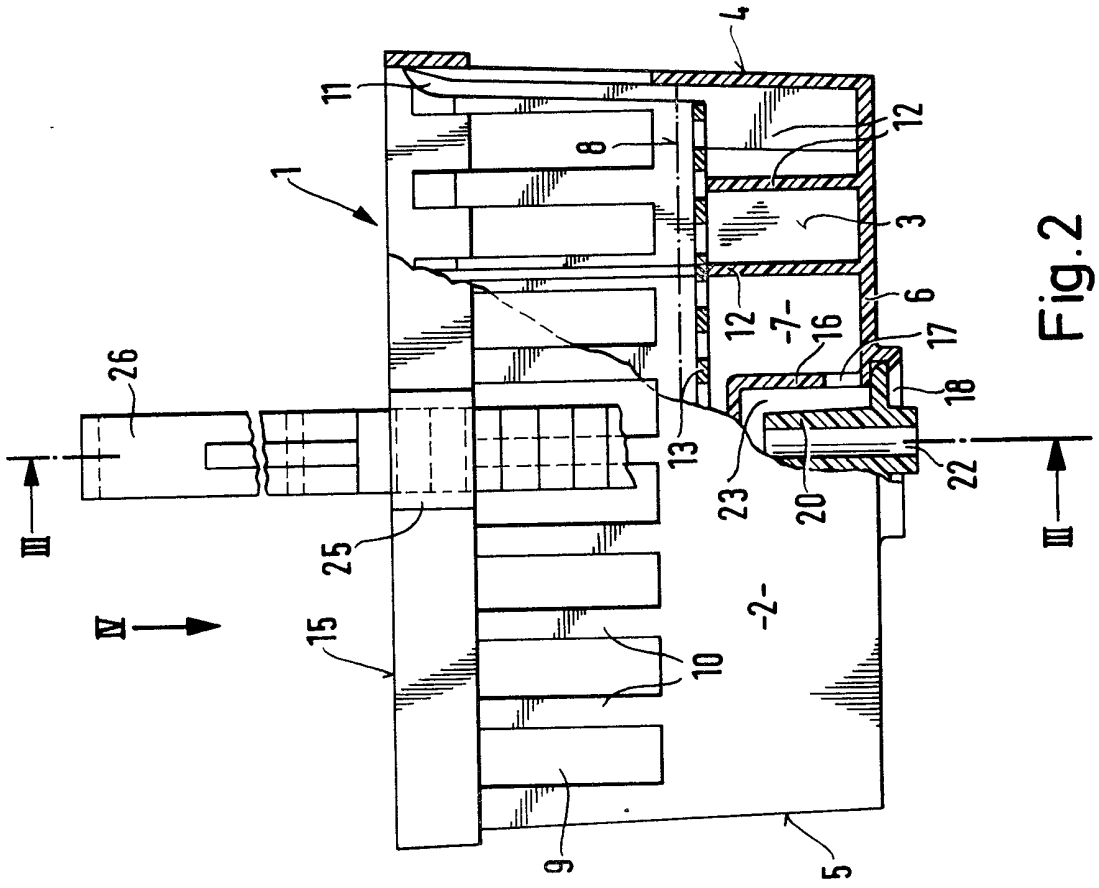

Fig.2

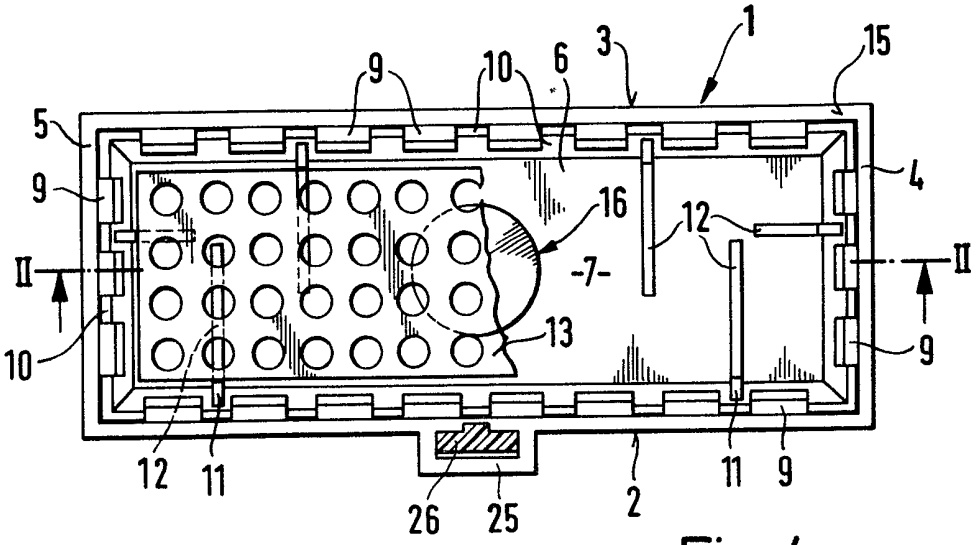
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Fig. 4

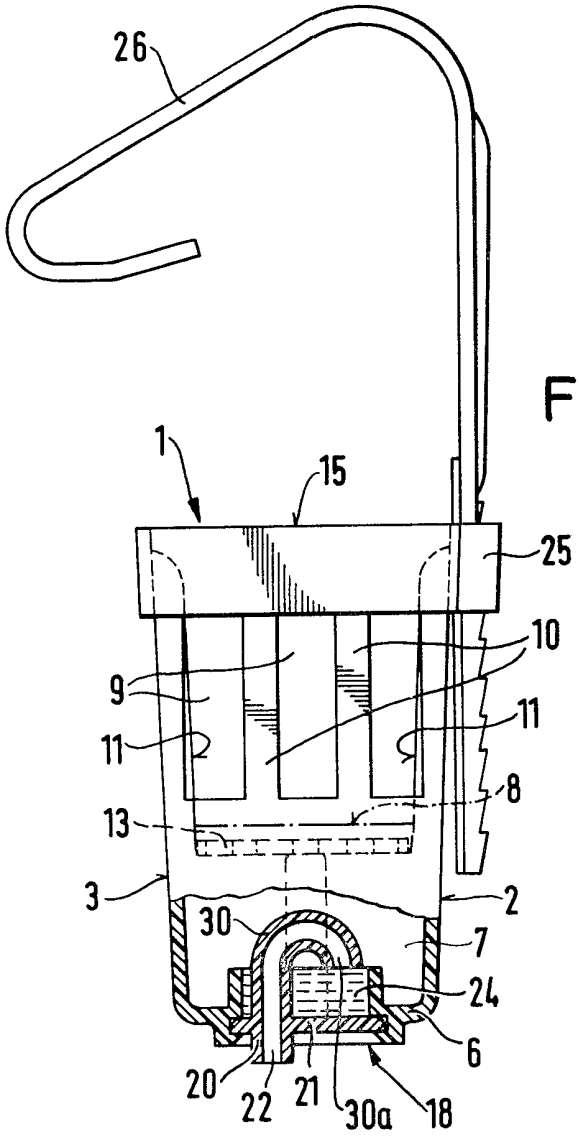
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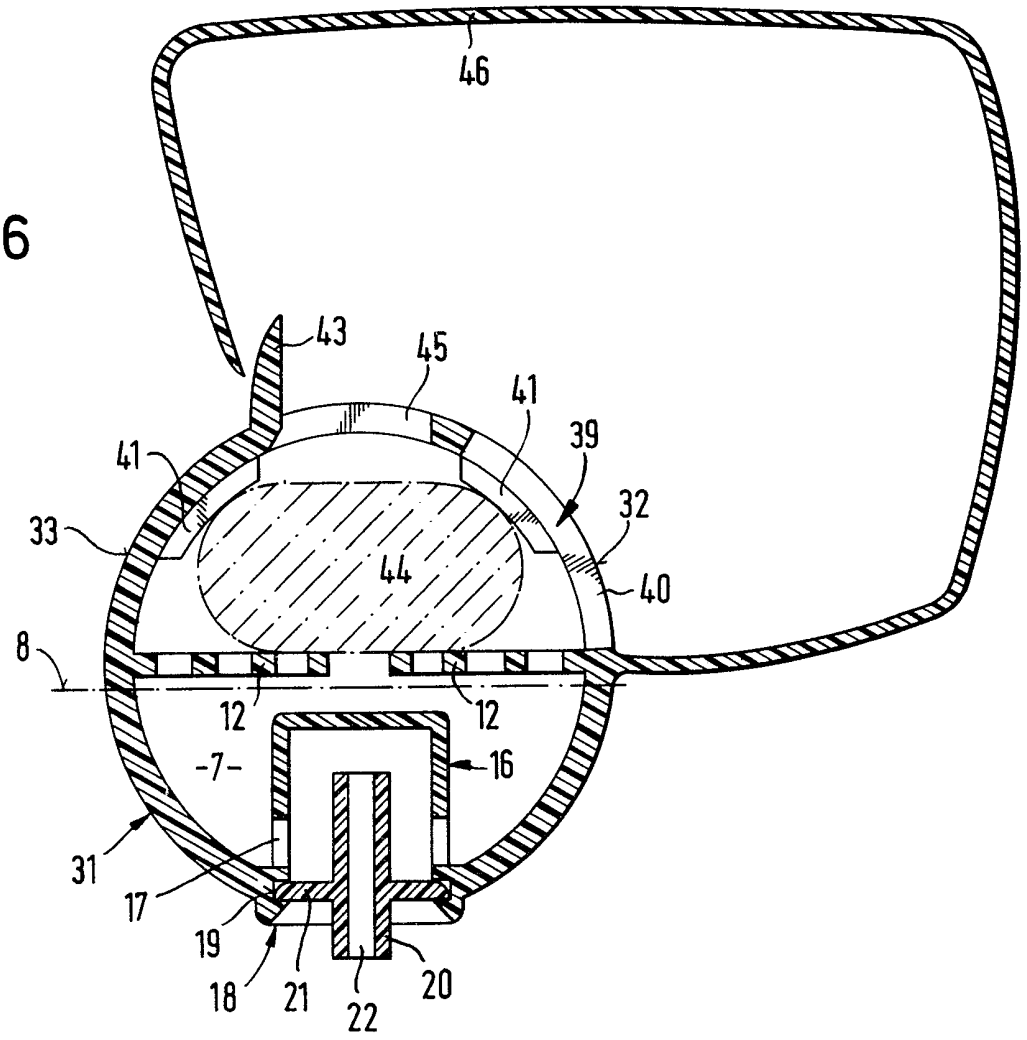
Fig. 5

Fig.6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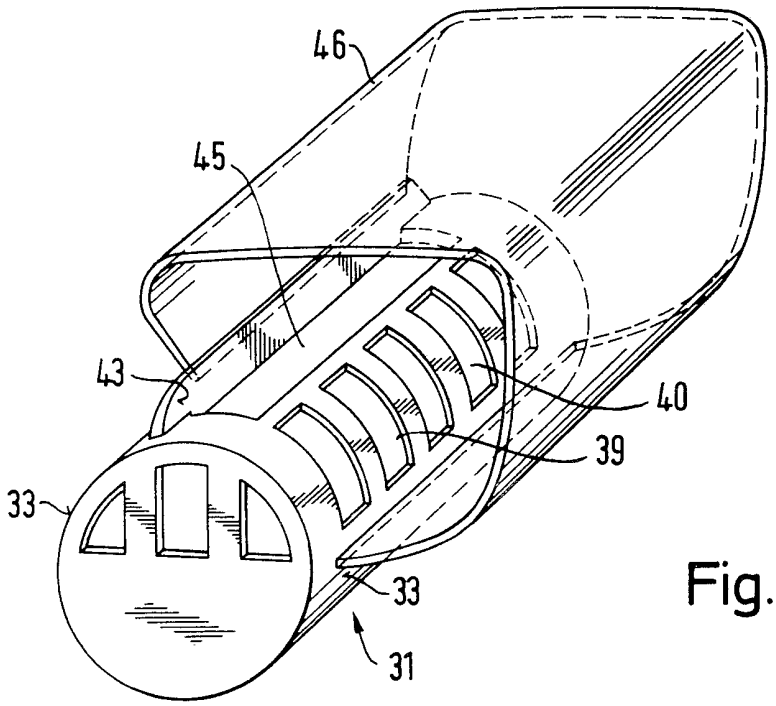
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Fig.7

SPECIFICATION

Toilet flush water coloriser

This invention relates to a toilet flush water coloriser which comprises a container adapted for receiving therein a flush water-coloring block and having at least one entry opening for admitting flush water therein-to, and outlet means for the discharge of colored flush water from the container.

Toilet flush water colorizers of the above-described type are known, for instance, from British patent specification No. 1,057,865 to J. Goddard & Sons Limited, wherein a receptacle containing an erodable coloring block, i.e. a block which is slowly dissolved and/or disintergrated from the outside inwardly by the flush water, is placed or hung into the cistern for the flush water of a toilet.

The coloring block contains as primary ingredient a soluble coloring material such as a dyestuff or pigment, a blue coloring of the flush water in the toilet bowl being preferred. Of course, such blocks or sticks are also known to contain disinfectants or deodorants, as well as cleaning agents. When, after actuation of the flushing device of the toilet repeatedly over a prolonged period of time, e.g. for a month or more, the flush water leaves the cistern uncolored, this will indicate that the coloring block has been consumed, its coloring agent being exhausted. Replacement of the exhausted block by a new one requires that the user can take off the lid of the cistern, put in the new block and then fasten the lid back in place. However, increasingly, such cisterns are being manufactured of thermoplastic resin material and after mounting the discharge valve means therein, the lid is fastened on the cistern by means of glueing or thermic welding, thus making replacement impossible.

As the effectiveness of active ingredients, in particular of deodorants, contained in such blocks which have been discharged from the block into the flush water in a toilet cistern in only very weak and hence unsatisfactory, blocks or sticks containing such ingredients have for some time been suspended in a small slotted container, e.g. a small elongated basket, at the inner sidewall of a toilet bowl, as has been described in French Patent Specification No. 1,602,063 to Madison Chemical Corporation (see also United States Patent Specification No. 3,529,309 to Seymour Leavitt et al, in particular Figure 3).

However, if a toilet bowl cleansing block of this type would contain a coloring agent such as blue dyestuff, besides the deodorant, disinfectant and cleansing agents now conventionally present therein, in order to color the flush water in the toilet bowl, e.g. a blue colour, at each flushing of the toilet, then this would have the drawback, confirmed by the applicant in numerous tests, that after each flushing , when the flow of flush water has subsided, the block tends to keep on dripping, i.e. drops of flush water continue, for a prolonged period of time, depending on the erodibility of the block, in fact often for five to ten hours or more, to flow down the sidewall of the toilet bowl. The concentration of colorant in these drops increases with time, thus producing on the sidewall a stripe of colour, e.g. of blue, which extends from the block container downwardly causing an unclean, unaesthetic aspect to the bowl. This stripe is the more difficult to remove, the longer the block has gone on dripping after the last flush.

According to the invention, a toilet flush water coloriser of the initially described type further comprises suspending means for suspending the container at the inside of a toilet bowl and a diluting chamber in the interior of the container adapted for collecting drops of colour concentrate dripping off a block after each flushing, and wherein the outlet means are located in the bottom of the diluting chamber.

In a preferred embodiment of the toilet flush water colorizer according to the invention, the diluting chamber comprises

(a) Supporting means in the container upper end of the diluting chamber therein and adapted for supporting a flush water-coloring block in container above the diluting chamber, which supporting means have at least one opening for permitting flush water to pass from the upper part of the container into the diluting chamber, and

(b) the container has a bottom and side walls, the latter being closed up to the upper end of the diluting chamber, and wherein

(c) the outlet means are located in the bottom of the container and are siphoning means adapted for siphoning off flush water from the diluting chamber down to a minimum sump level.

The supporting means can have a plurality of openings which narrow enough to prevent larger pieces of a colorizing block being eroded by flush water from dropping into the diluting chamber. Moreover, the supporting means can comprises projections from the inner sidewall of the container into the interior of the latter. These supporting means can also comprise a grid or perforated plate adapted for supporting a colouring block.

The siphoning means can comprise a suction tube in the lower part of the diluting chamber for suctioning off the colored flush water under the hydrostatic pressure thereof which prevails in the diluting chamber.

Preferably, the suction tube is sealingly inserted in the bottom of the diluting chamber and has its upper end curved wherby its upper opening is near the bottom of the diluting chamber.

In a most preferred embodiment, the suction tube is sealingly inserted upright in the bottom of the diluting chamber, having its upper opening near the upper end of the diluting chamber and its lower opening in or underneath the said bottom, and in which embodiment the siphoning means further comprise a cover member mounted on the bottom of the diluting chamber and having a closed upper part inside which the upper end of the suction tube opens; the cover member further has ports near or at the bottom of diluting chamber for the passage of colored flush water from the latter chamber into the interior of the cover member and onward into the suction tube.

Further details of the toilet flush water colorizer

according to the invention will be explained in the following description of preferred embodiments of the same illustrated in the accompanying drawings, in which

Figure 1 is a perspective view of a preferred embodiment of the toilet flush water coloriser according to the invention;

Figure 2 is a front view, partially in section, of the same embodiment;

Figure 3 is a cross-sectional view of the same embodiment, in a plane indicated by III-III in Figure 2;

Figure 4 is a view from above of the same embodiment as shown in Figures 1 to 3, of a toilet flush water coloriser being open at the top;

Figure 5 is cross-sectional view similar to that shown in Figure 3, but having a somewhat different embodiment of the siphoning means;

Figure 6 is a cross-sectional view of another embodiment of the toilet flush water coloriser according to the invention, and

Figure 7 is a perspective view of the embodiment shown in Figure 6 seen from the front and above, and having the conventional suspending clamp partially broken away.

The preferred embodiment of the toilet flush water colorizer according to the invention shown in Figures 1 to 4 comprises a container 1 having approximately the shape of a deep trough. The front wall 2, the rear wall 3 and the lateral end walls 4 and 5 are closed in their lower region upward to about half the height of the trough, and surround, together with a bottom 6, a diluting space or chamber 7, which latter can be filled with flush water up to a level 8, when the colorizer is hung in a toilet bowl and the flushing mechanism of the toilet is actuated. In the four walls 2, 3, 4 and 5, above the level 8, windows 9 are provided which are separated from one another by ports 10. Some of these ports 10 bear on their insides distancing projections 11, and as supporting means, carrier ribs 12 project horizontally into the interior space of the container 1 at level 8. Preferably, a grid or perforated plate 13 is placed on the carrier ribs 12. A coloring block or stick 14 which is indicated by a phantom line in Figure 3 rests on the aforesaid means. When a perforated plate 13 is used, the holes therein are preferably so narrow that larger pieces of the block which become loosened by the gradual erosion of the latter can not fall through these holes into the diluting space 7. At its upper end 15, the container 1 is preferably open.

In the embodiments of Figures 1 to 4, a siphoning device is provided in the bottom 6 of the container 1 and comprises a part 16, preferably having the shape of an inverted cup, which sits on the inside face of the bottom 6 and has ports 17 provided in its sidewall 16a near the bottom 6. In the bottom 6, centrally to the cover part 16, there is provided an opening 18 having a circumferential rim in which an annular groove 19 is provided. A straight discharge tube 20 bearing a closing flange 21 transverse to the tube axis, is pressed with the latter sealingly into the groove 19. Preferably, flange 21 is integral with the tube 20. Outlet tube 20 is thus mounted coaxially with the cover part 16 and has an axial outlet duct 22. Outlet tube 20 and the interior space 23 of cover part 16, in which the outlet tube 20 projects with its upper end to near the closed roof wall 16*b* thereof, constitute together a siphoning device by means of which colored flush water, filling the diluting space 7 maximally up to level 8, is suctioned off, at each flushing of the toilet, until the level of the liquid in space 7 has dropped again to the upper end of ports 17. In the liquid sumps 24 which remain above the bottom 6, any "after-dripping" drops of flush water of increasing colorant concentration are collected and diluted. However, due to the siphoning effect of the siphoning device, the phenomenon of drops dripping from the device for a long time after flushing is strongly reduced or even completed avoided.

In the preferred embodiment, the container 1 is manufactured in one piece from synethic plastics material by injection molding techniques, whereafter the tube 20 is pressed with its flange 21 into the groove 19 of bottom opening 18, in order to assemble the colorizer.

The container is provided in a conventional manner with a clasp or eyepiece 25 in which a known elastic suspending clip 26 is inserted, by means of which the container 1 can be attached to the inner upper sidewall of a toilet bowl below the inwardly projecting rim bead of the latter, which head may also project outwardly.

When the flushing mechanism of the toilet is actuated, flush water will flow along the underside of this upper rim bead on the inside at least of the rear wall of the toilet bowl, or, in other types of such bowls also from outlets at the underside of the rim bead about the entire circumference of the toilet bowl, with more or less pressure. This causes a certain turbulence of the flush water stream whereby always a sufficient amount of flush water penetrates into the container 1, dissolving or eroding colorant as well as, if present, other ingredients such as cleansing agents or disinfectants from the coloring block or stick, whereupon the flush water laden with such ingredients passes through the openings of the grid or perforated plate 13, or when the latter is missing, between the carrier bars 12 into the diluting space 7 therebelow.

Under the hydrostatic pressure of the hydrostatic flush water, which collects in diluting space 7 at each flushing, coloured flush water will then flow through the siphoning device consituted by cover part 16 and outlet tube 20 from container 1 into the toilet bowl. Subsequently no dripping of flush water drops of increased colorant concentration, and hence no staining of the sidewall of the toilet bowl underneath the container 1 will occur.

In the embodiment shown in Figure 5, the siphoning device consists of a simple suctioning tube 30 having a curved, downwardly opening bent portion 30*a*, the opening of which is inside the diluting space 7 near and above the bottom 6 of the latter. However, the making or assembly of this embodiment is more complicated, as the suction tube 30 is more difficult to make from synthetic plastics material, while its assembly is similar to that of the embodiment of Figures 1 to 4, if it is provided with

an annular flange by which it can engage the annular groove 19 of central bottom opening 18.

The embodiments shown in Figures 6 and 7 comprise a drum-shaped container 31 which is especially suitable for being hung in such toilet bowls in which the flush water does not emerge only at the inside of the rear wall of the toilet bowl but also underneath the circumference of the upper, inwardly projecting bowl bead. Below the level 8, the diluting space 7 and the siphoning device therein are devised analogous to that of the first embodiment, and in the region of the level 8, carrier bars 12 projecting into the interior of container 1 and/or a grid or perforated plate are provided as in the first embodiment.

In the upper part of container 31, the rear wall 33 thereof which is destined to come to lie against the sidewall of the toilet bowl, is preferably closed, while the front wall 32 a number of slots or windows 39 separated from one another by ports 40. Spacing elements 41 can be provided to project from the inside of the front wall 32 and of the rear wall 33.

In its upper wall the container 31 has an elongated axially extending slot or opening 45 and bears, at the edge of the latter adjacent the rear wall 33, an upwardly protruding baffle plate 34. Also in this embodiment, a coloring stick 44 rests on the supporting bars 12 or a grid or perforated plate placed on the latter, and is held in place by the spacing elements 41 which prevent it from resting against the wall of the container with ensuing non-uniform erosion.

A fastening clip 42 is also provided, by means of which the container 31 can be hung into a toilet bowl with the upper edge of baffle plate 43 abutting against the underside of the upper inwardly projecting toilet bowl head in such a manner that flush water outler orifices in that underside are located inwardly of baffle plate 43 toward the interior of the toilet bowl. Flush water which emerges from these orifices or otherwise streams along that bead underside is deflected by the baffle plate 43 through the axial slot 45 onto the coloring block or stick 44.

In all other aspects, the effect of diluting chamber 7 and of the siphoning device of that embodiment is the same as in the embodiments of Figures 1 to 5.

CLAIMS

1. A toilet flush water coloriser comprising a container adapted for receiving therein a flush water-coloring block and having at least one entry opening for admitting flush water thereinto and outlet means for the discharge of coloured flush water from the container, which coloriser further comprises suspending means for suspending the container on the inside of a toilet bowl, a diluting chamber in the interior of the container adapted for collecting drops of colour concentrate dripping off a block after each flushing, the outlet means being located in the bottom of the diluting chamber.

2. A toilet flush water coloriser according to claim 1 and further comprising supporting means in the container across the upper end of the diluting chamber and adapted for supporting a flush water-colouring block in the container above said diluting chamber, and supporting means having at least one opening for permitting flush water to pass from the upper part of the container into said diluting chamber, the container having a bottom and sidewalls, the latter being closed up to the upper end of the diluting chamber, and wherein the outlet means are located in the bottom of the container and are constituted by siphoning means adapted for siphoning off flush water from the diluting chamber down to a minimum sump level.

3. A toilet flush water coloriser according to claim 2 wherein the supporting means have a plurality of openings which are narrow enough to prevent larger pieces of a colouring block being eroded by flush water from dropping into the diluting chamber.

4. A toilet flush water coloriser according to claim 2 or 3 wherein the supporting means comprise projections from the inner sidewall of the container into the interior of the latter.

5. A toilet flush water coloriser according to claim 2 or 3 wherein the supporting means comprise a grid or perforated plate adapted for supporting a coloring block.

6. A toilet flush water coloriser according to any one of claims 2 to 5 wherein the siphoning means comprise a suction tube in the lower part of the diluting chamber for suctioning off coloured flush water under the hydrostatic pressure thereof in the diluting chamber.

7. A toilet flush water coloriser according to claim 6, wherein the suction tube is sealingly inserted in the bottom of the diluting chamber and has its upper end curved whereby its upper opening is near the bottom of the diluting chamber.

8. A toilet flush water coloriser according to claim 6, wherein the suction tube is sealingly inserted upright in the bottom of the diluting chamber, having its upper opening near the upper end of the diluting chamber and its lower opening in or underneath the bottom, and wherein the siphoning means further comprise a cover member mounted on the bottom and having a closed upper part inside inside which the upper end of the suction tube opens, the cover member further having ports near or at the bottom of the diluting chamber for the passage of coloured flush water from the latter chamber into the interior of the cover member and into the suction tube.

9. A toilet flush water coloriser substantially as hereinbefore described with reference to Figures 1 to 4 of the accompanying drawings.

10. A toilet flush water coloriser substantially as hereinbefore described with reference to Figures 6 and 7.

New claims or amendments to claims filed on 24.8.79

Superseded claims: 1 to 10

New or amended claims:

1. A toilet flush water coloriser comprising a container adapted for receiving therein a flush water-colouring block and having at least one entry opening for admitting flush water thereinto and

outlet means for the discharge of coloured flush water from container, which coloriser further comprises means for suspending the container at the inside of a toilet bowl, a diluting chamber in the lower part of the interior of the container and adapted for collecting drops of colour concentrate dripping off a block after each flushing; supporting means in the container across the upper end of the diluting chamber and adapted for supporting a flush water-colouring block in the upper part of the container above the diluting chamber, the supporting means having at least one opening for permitting flush water to pass from the upper part of the container into the diluting chamber, the container having a bottom and side walls, the side walls being closed up to the upper end of the diluting chamber, and wherein the outlet means are located in the bottom of the container in communication with the diluting chamber and comprise siphoning means having a siphon passage the apex of which passage is below the upper end of the diluting chamber and below the level of the supporting means, the siphoning means being adapted for siphoning off flush water from the diluting chamber down to a minimum sump level.

2. A toilet flush water coloriser according to claim 1 wherein the supporting means have a plurality of openings which are narrow enough to prevent larger pieces of a colouring block being eroded by flush water from dropping into the diluting chamber.

3. A toilet flush water coloriser according to claim 1 or 2 wherein the supporting means comprise projections from the inner sidewall of the container into the interior of the latter.

4. A toilet flush water coloriser according to claim 1 or 2 wherein the supporting means comprise a grid or perforated plate adapted for supporting a colouring block.

5. A toilet flush water coloriser according to any one of claims 1 to 4 wherein the siphoning means comprise a suction tube in the lower part of the diluting chamber for suctioning off coloured flush water under the hydrostatic pressure thereof in the diluting chamber.

6. A toilet flush water coloriser according to claim 5, wherein the suction tube is sealingly inserted in the bottom of the diluting chamber and has its upper end curved whereby its upper opening is near the bottom of the diluting chamber.

7. A toilet flush water coloriser according to claim 5, wherein the suction tube is sealingly inserted upright in the bottom of the diluting chamber, having its upper opening near the upper end of the diluting chamber and its lower opening in or underneath the bottom, and wherein the siphoning means further comprise a cover member mounted on the bottom and having a closed upper part inside which the upper end of the suction tube opens, the cover member further having ports near or at the bottom of the diluting chamber for the passage of coloured flush water from the latter chamber into the interior of the cover member and into the suction tube.

8. A toilet flush water coloriser substantially as hereinbefore described with reference to Figures 1 to 4 of the accompanying drawings.

9. A toilet flush water coloriser substantially as hereinbefore described with reference to Figures 6 and 7 of the accompanying drawings.

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