



(19) **United States**

(12) **Patent Application Publication**  
**Zuechner et al.**

(10) **Pub. No.: US 2016/0251840 A1**

(43) **Pub. Date: Sep. 1, 2016**

(54) **DEVICE FOR DISPENSING AN ACTIVE-SUBSTANCE PREPARATION INTO A TOILET BOWL**

**Publication Classification**

(71) Applicant: **Henkel AG & Co. KGaA**, Duesseldorf (DE)

(51) **Int. Cl.**  
*E03D 9/03* (2006.01)  
(52) **U.S. Cl.**  
CPC ..... *E03D 9/032* (2013.01); *E03D 2009/024* (2013.01)

(72) Inventors: **Lars Zuechner**, Langenfeld (DE); **Jens Leffler**, Kaarst (DE); **Anke Klemmstein**, Leichlingen (DE); **Katja Gerhards**, Duesseldorf (DE); **Marc-Steffen Schiedel**, Monheim (DE)

(57) **ABSTRACT**

The invention relates to a device (1) for dispensing water-soluble active-substance preparations (5, 6) into a toilet bowl, having an accommodating container (2) which is to be arranged in the toilet bowl, wherein the accommodating container (2) can be fastened on the toilet bowl, wherein the accommodating container (2) comprises at least a first chamber (3) and a second chamber (4), wherein the first chamber (3), when flushing water flows over into it, dispenses a first active-substance preparation (5) into the toilet bowl, and the second chamber (4), when flushing water flows over into it, dispenses a second active-substance preparation (6) into the toilet bowl, and wherein the chambers (3, 4) are configured such that the first active-substance preparation (5) and the second active-substance preparation (6) are dispensed into the toilet bowl at staggered intervals.

(21) Appl. No.: **14/959,145**

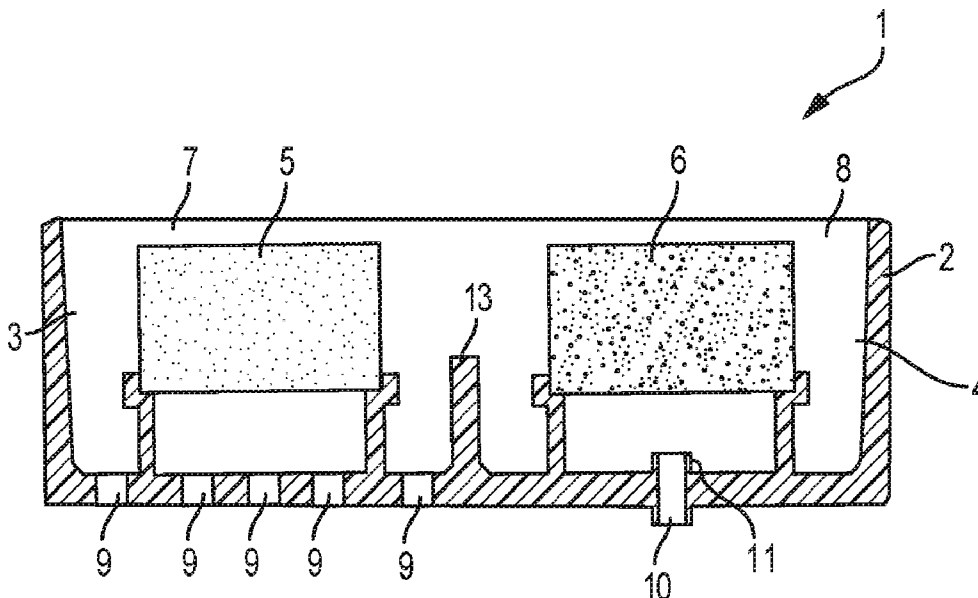
(22) Filed: **Dec. 4, 2015**

**Related U.S. Application Data**

(63) Continuation of application No. PCT/EP2014/056887, filed on Apr. 7, 2014.

**Foreign Application Priority Data**

(30) Jun. 5, 2013 (DE) ..... 10 2013 210 435.9



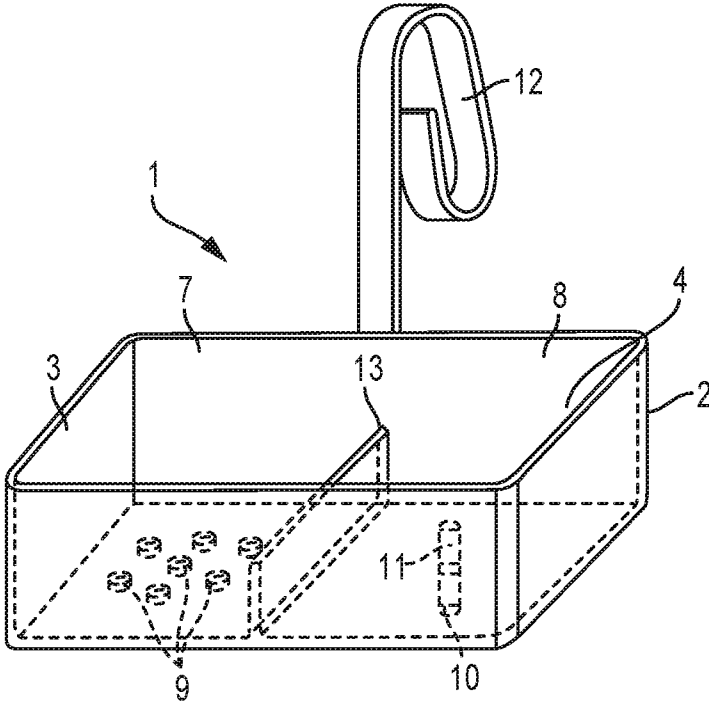


FIG. 1A

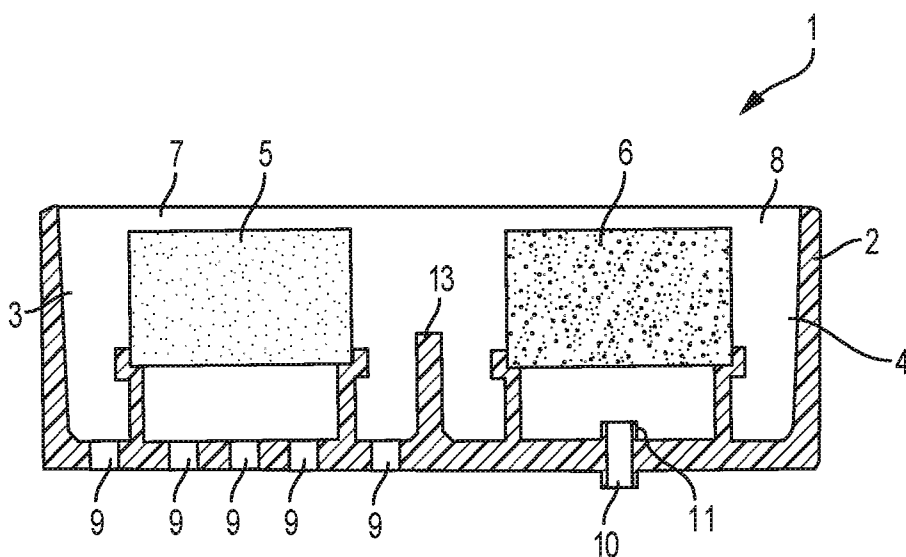


FIG. 1B

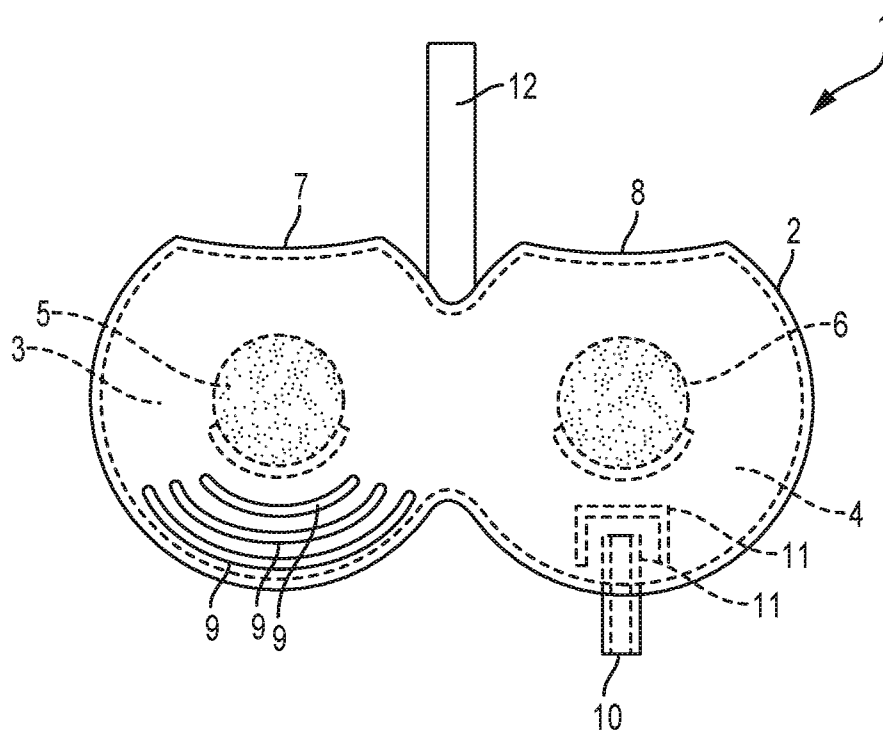


FIG. 2

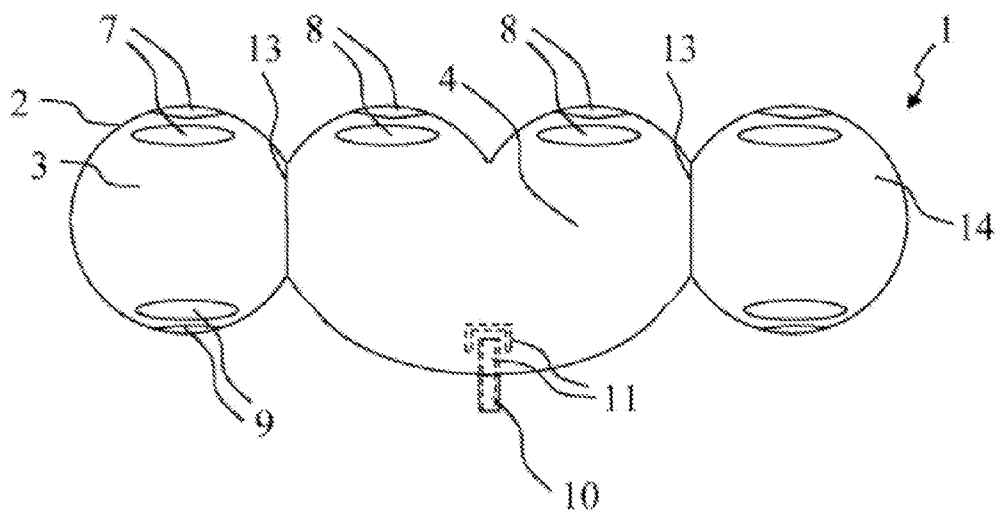


FIG. 3

**DEVICE FOR DISPENSING AN ACTIVE-SUBSTANCE PREPARATION INTO A TOILET BOWL**

**FIELD OF THE INVENTION**

[0001] The present invention generally relates to a multi-chamber device for dispensing active ingredient preparations into a toilet bowl, having an accommodating container for the active ingredient preparation, to be arranged in a toilet bowl, typically beneath its rim, and has water flowing over it when flushing.

**BACKGROUND OF THE INVENTION**

[0002] For automatic cleaning of toilet bowls, it is known that active ingredient preparations in block form and/or essentially in solid form (“toilet bowl blocks”) in a cage-type accommodating container on the inside rim of the toilet bowl. With each flushing operation, a portion of the active ingredient preparation of a toilet block dissolves in the flush water and is distributed in the toilet bowl together with the flush water. Such a device is known from EP 2310582 (A1), for example. In addition, a smaller portion of the dissolved active ingredient preparation remains in the residual water in the toilet bowl and also ensures cleaning there. However, the amount of active ingredient preparation remaining in the toilet bowl after the flushing operation is quite small.

[0003] The same problem also exists for devices (toilet baskets) for dispensing liquid active ingredient preparations. Such a device is known from EP 1334239 B1, for example.

[0004] One important disadvantage of all these toilet baskets is thus that the dosing of all active ingredient preparations, which are present in the accommodating container and are optionally different, takes place essentially simultaneously and during the flushing operation. As a result, active ingredient preparations, which should manifest their effect after the start of or at least partially at the end of the flushing operation, cannot function optimally.

[0005] The object of the invention is therefore to improve upon a device for dispensing active ingredient preparations into a toilet bowl, so that dispensing of the active ingredient preparations into a toilet bowl takes place at the optimum point in time.

[0006] Furthermore, other desirable features and characteristics of the present invention will become apparent from the subsequent detailed description of the invention and the appended claims, taken in conjunction with the accompanying drawings and this background of the invention.

**BRIEF SUMMARY OF THE INVENTION**

[0007] Device (1) for dispensing active ingredient preparations (5, 6) into a toilet bowl, with an accommodating container (2) to be arranged in the toilet bowl, wherein the accommodating container (2) can be fastened on the toilet bowl, wherein the accommodating container (2) comprises at least one first chamber (3) and one second chamber (4) wherein the first chamber (3) dispenses a first active ingredient preparation (5) into the toilet bowl when overflowed by flush water, and the second chamber (4) dispenses a second active ingredient preparation (6) into the toilet bowl on being overflowed by flush water, characterized in that the chambers (3, 4) are designed so that the first active ingredient preparation (5) and

the second active ingredient preparation (6) are dispensed into the toilet bowl at staggered intervals between them with the same overflow.

**BRIEF DESCRIPTION OF THE DRAWINGS**

[0008] The present invention will hereinafter be described in conjunction with the following drawing figures, wherein like numerals denote like elements, and

[0009] FIG. 1A shows a perspective view of the device wherein the device is shown as open and without active ingredient preparations;

[0010] FIG. 1B shows a section through a device according to the invention along the sectional plane A-A from FIG. 1;

[0011] FIG. 2 shows a device according to the invention with active ingredient preparations, wherein the time delay device is a siphon; and

[0012] FIG. 3 shows another device according to the invention with active ingredient preparations, wherein the time delay device is a siphon.

**DETAILED DESCRIPTION OF THE INVENTION**

[0013] The following detailed description of the invention is merely exemplary in nature and is not intended to limit the invention or the application and uses of the invention. Furthermore, there is no intention to be bound by any theory presented in the preceding background of the invention or the following detailed description of the invention.

[0014] The device according to the invention for dispensing active ingredient preparations into a toilet bowl comprises an accommodating container to be arranged in the toilet bowl, wherein the accommodating container can be fastened on the toilet bowl. The accommodating container comprises one first chamber and at least one second chamber. The first chamber dispenses a first active ingredient preparation into the toilet bowl when flush water flows over it, and the second or additional chamber dispenses a second or additional active ingredient preparation into the toilet bowl when flush water flows over it. The chambers are designed so that at least the first active ingredient preparation and the second or additional active ingredient preparation are dispensed into the toilet bowl at staggered intervals from one another and also at least one of the active ingredient preparations is dispensed into the toilet bowl with a time lag with respect to the flushing operation. If there are more than two chambers, then the additional chambers may again contain the first, second or an additional active ingredient preparation, which is dispensed into the toilet bowl at different times or preferably at the same point in time as the corresponding preparations from the first or second chamber. However, they may also contain one or more additional active ingredient preparations, which can in turn be dispensed into the toilet bowl either simultaneously with one of the other preparations or at staggered intervals.

[0015] In the sense of this invention, an “active ingredient preparation” is understood to be a liquid, gelatinous or solid preparation, which is partially dissolved when it comes in contact with flush water and can then be dispensed into the toilet bowl as an active ingredient-containing solution, i.e., mixture of flush water and active ingredient. Such an active ingredient-containing solution can also be formed in the accommodating container when flush water flows over a solid or gelatinous toilet cleaning block, for example, and then can be dispensed into the toilet bowl.

**[0016]** The staggered intervals permit a targeted dispensing of the same or different active ingredient preparations into the toilet bowl at different times. An ordinary flushing process within a conventional toilet bowl has two characteristic points in time, namely the start of flushing and the end of flushing. These points in time define the time windows: before the flushing operation, during the flushing operation and after the flushing operation. The first and second active ingredient preparations are preferably different. Since different active ingredient preparations can have different functions, it is often advisable to dispense different active ingredient preparations at different points in time in the course of the flushing process in order to optimally fulfill these functions. Such an optimized dispensing saves on the active ingredient preparation and achieves the best performance.

**[0017]** The device according to the invention, which does not have an additional mechanism, for example, an electric mechanism for independent dispensing of the active ingredient, can dispense the active ingredient preparation out of the first chamber and into the flush water and thus into the toilet bowl at the start of the flushing operation at the earliest. The flush water then flows over the first chamber, among others, and penetrates through an inlet into the first chamber, where, as an active ingredient-containing solution, enriched with the first active ingredient, it flows over the first active ingredient preparation and then out of the first chamber, through an outlet and in the direction of the toilet bowl. Similarly, the second active ingredient preparation flows out of the second chamber into the toilet bowl but it is dispensed at staggered intervals.

**[0018]** The first and second chambers are designed so that, with the same overflow, the first active ingredient preparation and the second active ingredient preparation are dispensed into the toilet bowl at staggered intervals from one another. The staggered dispensing of active ingredient preparation into the toilet bowl in the sense of the invention means that:

- i) the dispensing of the at least two different active ingredient preparations starts at least at two different times with respect to the flushing operation and/or
- ii) the dispensing of the at least two different active ingredient preparations ends at least at two different time with respect to the flushing operation.

**[0019]** Thus, for example, the dispensing of the second active ingredient preparation may begin at least 1 s, preferably at least 2 s, after the start of the dispensing of the first active ingredient preparation and/or it lasts, for example, at least 1 s, preferably at least 2 s longer than the dispensing of the first active ingredient preparation.

**[0020]** There are different types of toilets with different flushing ratios and flushing times. The device according to the invention is designed for toilet bowls with flushing operations, in which the flush water flows over at least one location on the inside wall of the toilet bowl. The device according to the invention is therefore suitable for, among other things, toilet bowls according to the standard EN 997 (2003+A1: 2006) class 1.

**[0021]** The concept of “equal overflow” in the sense of the invention presupposes in particular also a simultaneous start of overflow. The device preferably includes a flush water distributing element, for example, a distributor plate, such as that known from EP 2310582, which is arranged and configured so that the flush water distributing element is acted upon by flush water during flushing and causes a uniform dispensing of the flush water into all chambers.

**[0022]** The time lag is preferably achieved by a time delay device. The time delay device is arranged inside the flush water stream, which can flow through one of the chambers to influence the flow.

**[0023]** In a preferred variant of the invention, the time delay device is arranged, so that the current outflow out of the chamber is influenced. Examples of the time delay device inside a chamber include:

(i) outlet holes in a smaller number and/or with a smaller diameter in comparison with the other chambers not having a time delay device, so that the outflow out of the chamber begins at a measurably later point in time and/or proceeds more slowly;

(ii) a lower outlet opening, which is arranged above a bottom plate of the chamber, so that the chamber can first run full up to the height of this lower outlet opening before it empties;

(iii) a standing pipe into the chamber as the outlet, so that the chamber can first run full up to the height of the inner end of the pipe before it empties;

(iv) a siphon through which a triggering threshold level and a termination threshold level for flush water with solution containing active ingredient in the receiving chamber are defined and by means of which an outflow of flush water with active ingredient-containing solution through the siphon can begin and/or stop. The preferred variants for the time delay device are explained in greater detail below.

**[0024]** In one embodiment of the invention, at least one of the first and second chambers, preferably the second chamber, includes a time delay device.

**[0025]** In another embodiment of the invention, the second chamber includes a time delay device, and the first chamber includes another time delay device, which has a different time delay than that of the time delay device of the second chamber. In another embodiment of the invention, the second chamber includes a time delay device, while the first chamber does not have a time delay device. The first active ingredient preparation from the first chamber is thus dispensed out of the first chamber and into the toilet bowl immediately after the start of the overflow of the accommodating container. In this case, the time interval between the start of the overflow of the accommodating container and the dispensing out of the first chamber is much shorter than 1 s, preferably shorter than 0.2 s. Fundamentally, in the sense of the invention, a chamber does not have a time delay device if a defined quantity of flush water can flow out of one chamber essentially at the same speed as or faster than it can flow into the respective chamber.

**[0026]** In a preferred embodiment of the invention, the outlet opening(s) of the second chamber has (have) a smaller total cross section with respect to the first outlet opening(s) of the first chamber. For example, with the same number of outlet openings in the individual chambers, the individual outlet openings of the first chamber have a larger individual diameter than the outlet openings of the second chamber. Although the first and second chambers with the same overflow receive flush water at the same time, the flush water with the active ingredient-containing solution flows out of the second chamber more slowly because of the smaller total cross section of the outlet openings and thus causes the dispensing of active ingredient preparation from the second chamber to take place over a longer period of time. Due to this variant, a time lag can be achieved in the dispensing of the active ingredient with respect to the actual flushing operation in a very favorable manner.

[0027] In another advantageous embodiment of the invention, the second chamber with the time delay device has a smaller number of outlet openings in comparison with the other chambers without a time delay device. Optionally only one single outlet opening is present in the second chamber. Due to this lower number, only a smaller volume of flush water can flow out in the same period of time, so that a time lag is achieved with respect to the first chamber having more outlet openings.

[0028] In another embodiment of the invention, the time delay device is designed as a pipe, which is preferably arranged on the bottom of the second chamber and also preferably protrudes into the second chamber.

[0029] In a particularly preferred embodiment of the invention, the time delay device is a siphon. It has been found that chambers with smaller volumes fill up with flush water quite rapidly during the flushing operation and leave less opportunity for adjusting the setting of the time delay of the start of the outflow. On the other hand, it has been found that a siphon can be designed in a very flexible manner, so that the outflow can be delayed for a few seconds in comparison with the start of flushing, even in smaller chambers. Therefore, a siphon is a preferred time delay device. A siphon is also preferred for chambers with a water collecting volume of less than or equal to 50 cm<sup>3</sup>, even more preferably less than or equal to 30 cm<sup>3</sup>. In a preferred variant with a siphon, the siphon includes a pipe and a lid, which is placed on the pipe.

[0030] Due to time-staggered dispensing of active ingredient preparations at staggered intervals, a targeted dispensing of active ingredient preparations, in particular different active ingredient preparations, in the various intervals of time during the flushing operation is possible. Therefore, a particularly effective and targeted dispensing of individual active ingredients at the best possible point in time is ensured without using a complicated regulating unit.

[0031] In one embodiment of the invention, the first and second active ingredient preparations contain ingredients that are incompatible with one another. If these ingredients are present in a preparation at the same time, they could enter into unwanted chemical reactions with one another, for example, or could lead to phase separation. However, these may also be different colorants, a mixture of which in a single phase would lead to an altered and undesirable color impression. Examples of ingredients that may be incompatible with one another include, for example, bleaching agents and colorants or fragrances or proteases and other enzymes. Those skilled in the art are well aware of other examples. Due to the time-staggered dispensing, the two active ingredient preparations can manifest their effects at least partially independently of one another.

[0032] In another embodiment of the invention, the first active ingredient preparation and the second active ingredient preparation are compatible with one another but they should manifest their effects at different times, so that they are stored in different chambers of the device. In a preferred refinement, the first and second active ingredient preparations contain different active ingredients of the same active ingredient class, which, however, are different chemically. Thus, for example, different surfactants or different enzymes may be used. In addition, the first and second active ingredient preparations may contain the same ingredients in different concentration.

[0033] In one embodiment of the invention, the second active ingredient preparation includes at least one active

ingredient, which should manifest its effect mainly after a flushing operation. One example of such an active ingredient is a water-soluble colorant, which colors the flush water, wherein a blue color is preferred. Due to definite running on, even after the end of the flushing operation, this colorant is not flushed away but instead remains in the toilet sump in a sufficient concentration, i.e., it is still present in the residual flush water remaining in the toilet bowl in order to impart a color, preferably blue, to this water. Additional examples of active ingredients that manifest their effect even or mainly after the end of the flushing operation include fragrances and ingredients that dissolve lime and urine deposits, clear rinses or substances to increase the gloss, surface treatment agents, for example, soil-repellant active ingredients or active ingredients for controlling bad odors, disinfectants and/or bleaching agents, foam boosters.

[0034] In another embodiment of the invention, one of the active ingredient preparations includes an active ingredient, which manifests its effect mainly during a flushing operation, for example, a surfactant for producing foam. The flushing operation is used to produce foam by mixing air and flush water enriched with surfactant. This surfactant should be dispensed into the flush water essentially during the flushing operation to prevent excessive dispensing of the surfactant active ingredient.

[0035] Another example is an active ingredient preparation, which should clean the toilet bowl by a chemical mechanical cleaning. This can be dispensed during the flushing operation, preferably starting immediately at the start of the flushing operation. The flow of enriched flush water ensures the mechanical part of the toilet cleaning.

#### Perfume

[0036] Preferably at least one of the active ingredient preparations contains one or more fragrances. These are presented in the solid, gelatinous or liquid active ingredient preparation, i.e., in the toilet block or toilet cleaner preferably in an amount of 0.01 to 10% by weight, in particular 0.05 to 8% by weight, especially preferably 0.1 to 5% by weight. One perfume component that may be present is d-limonene. In an especially preferred embodiment, the active ingredient preparation contains adherent scents, in particular ethereal oils (known as essential oils). These include, for example, pine oil, citrus oil, jasmine oil, patchouli oil, rose oil or ylang-ylang oil, which can be used in the sense of this invention. Also suitable are clary sage oil, chamomile oil, lavender oil, *chrysanthemum* oil, melissa oil, mint oil, cinnamon leaf oil, lime blossom oil, juniper berry oil, vetiver oil, olibanum oil, *galbanum* oil and labdanum oil as well as orange blossom oil, neroli oil, orange peel oil and sandalwood oil. However, other adherent scents, such as the higher-boiling and/or solid scents of natural or synthetic origin, and also more volatile scents, in particular the lower-boiling scents of natural or synthetic origin, which may be used alone or in mixtures, are also advantageous for use in the perfume oil within the scope of the present invention. It may also be preferable for the agent used in the different chambers to contain different fragrances, so that the fragrance impression changes after conclusion of the flushing operation. In addition, it may also be preferable for the agents used in the different chambers to contain the same fragrances, but in different concentrations, so that after conclusion of the flushing operation, the fragrance is perceived in a different intensity.

## Surfactants

**[0037]** At least one of the active ingredient preparations contains at least one surfactant, which is selected from the group of anionic surfactants, nonionic surfactants, amphoteric or zwitterionic surfactants, cationic surfactants as well as mixtures thereof. Preferably at least one anionic surfactant is present.

**[0038]** Within the scope of the present invention, fatty acids and/or fatty alcohols and/or derivatives thereof—unless otherwise indicated—represent branched or unbranched carboxylic acids and/or alcohols and/or derivatives thereof, preferably with 6 to 22 carbon atoms, in particular 8 to 20 carbon atoms, especially preferably 10 to 18 carbon atoms, most preferably 12 to 16 carbon atoms, for example, 12 to 14 carbon atoms. Because of their plant basis, the former are preferred in particular for ecological reasons as being based on renewable raw materials, but the teaching according to the invention is not limited to these. In particular the oxo alcohols and/or derivatives thereof that can be obtained according to Roelen's oxo synthesis, preferably with 7 to 19 carbon atoms, in particular 9 to 19 carbon atoms, especially preferably 9 to 17 carbon atoms, most preferably 11 to 15 carbon atoms, for example, 9 to 11, 12 to 15 or 13 to 15 carbon atoms, can be used accordingly.

**[0039]** Solid toilet blocks preferably contain at least one alkylbenzene sulfonate and at least one olefin sulfonate. In addition, other surfactants may also be present, in particular those from the group of anionic and/or nonionic surfactants.

**[0040]** Of the alkylbenzene sulfonates, in particular those with approximately 12 carbon atoms in the alkyl part are preferred, such as linear sodium C<sub>10-13</sub> alkylbenzene sulfonate. Preferred olefin sulfonates have a carbon chain length of 14 to 16. The toilet cleaning block preferably contains 10 to 70% by weight, preferably 20 to 65% by weight, especially preferably 20 to 30% by weight alkylbenzene sulfonate and preferably 10 to 30% by weight, especially 15 to 30% by weight, especially preferably 15 to 25% by weight olefin sulfonate.

**[0041]** As additional anionic surfactants, the toilet cleaning block may contain aliphatic sulfates such as fatty alcohol sulfates, fatty alcohol ether sulfates, dialkyl ether sulfates, monoglyceride sulfates and aliphatic sulfonates such as alkane sulfonates, ether sulfonates, n-alkyl ether sulfonates, ester sulfonates and lignin sulfonates. Also usable within the scope of the present invention are fatty acid cyanamides, sulfosuccinates (sulfosuccinic acid esters), in particular sulfosuccinic acid mono- and di-C<sub>8</sub>-C<sub>18</sub> alkyl esters, sulfosuccinamates, sulfosuccinamides, fatty acid isethionates, acylaminoalkane sulfonates (fatty acid taurides), fatty acid sarcosinates, ether carboxylic acids and alkyl (ether) phosphates as well as  $\alpha$ -sulfo fatty acid salts, acyl glutamates, monoglyceride disulfates and alkyl ethers of glycerin disulfate.

**[0042]** The fatty alcohol sulfates and/or fatty alcohol ether sulfates, in particular the fatty alcohol sulfates are preferred. Fatty alcohol sulfates are products of sulfation reactions on corresponding alcohols, whereas fatty alcohol ether sulfates are products of sulfation reactions on alkoxyated alcohols. Those skilled in the art understand alkoxyated alcohols in general to be the reaction products of alkylene oxide, preferably ethylene oxide, with alcohols, preferably with longer chain alcohols in the sense of the present invention. Usually n mols of ethylene oxide and one mol of alcohol will yield a complex mixture of addition products of different degrees of

ethoxylation, depending on the reaction conditions. Another embodiment of alkoxylation consists of the use of mixtures of alkylene oxides, preferably the mixture of ethylene oxide and propylene oxide. Preferred fatty alcohol ether sulfates are the sulfates of lower ethoxyated fatty alcohols with 1 to 4 ethylene oxide units (EO), in particular 1 to 2 EO, for example, 1.3 EO.

**[0043]** The anionic surfactants are preferably used as sodium salts but may also be used as other alkali or alkaline earth metal salts, for example, magnesium salts, and in the form of ammonium salts or mono-, di-, tri- and/or tetraalkylammonium salts, or in the case of sulfonates, also in the form of their corresponding acid, e.g., dodecylbenzene sulfonic acid.

## Nonionic Surfactants

**[0044]** Nonionic surfactants within the scope of the invention may be alkoxyates such as polyglycol ethers, fatty alcohol polyglycol ethers, alkyl phenol polyglycol ethers, end group capped polyglycol ethers, mixed ethers and hydroxymixed ethers and fatty acid polyglycol esters. Ethylene oxide/propylene oxide block copolymers, fatty acid alkanolamides and fatty acid polyglycol ethers can also be used. The polyol surfactants are another important class of nonionic surfactants that can be used according to the invention, and here in particular the glycosurfactants, such as alkyl polyglycosides and fatty acid glucamides. Especially preferred are the alkyl polyglycosides, in particular the alkyl polyglucosides, as well as the fatty alcohol alkoxyates (fatty alcohol polyglycol ethers) in particular.

**[0045]** Preferred fatty alcohol alkoxyates are branched or unbranched, saturated or unsaturated C<sub>8-22</sub> alcohols alkoxyated with ethylene oxide (EO) and/or propylene oxide (PO) with a degree of alkoxylation of up to 30, preferably ethoxyated C<sub>12-22</sub> fatty alcohols fatty alcohols with a degree of ethoxylation of less than 30, preferably 12 to 28, in particular 20 to 28, especially preferably 25, for example, C<sub>16-18</sub> fatty alcohol ethoxyates with 25 EO.

**[0046]** Alkyl polyglycosides are surfactants that can be obtained by reacting sugars and alcohols according to the relevant methods of preparative organic chemistry, resulting in a mixture of monoalkylated, oligomeric or polymeric sugars, depending on the method of preparation. Preferred alkyl polyglycosides are the alkyl polyglucosides, where the alcohol is especially preferably a long-chain fatty alcohol or a mixture of long-chain fatty alcohols with branched or unbranched C<sub>8</sub> to C<sub>18</sub> alkyl chains, and the degree of oligomerization (DP) of the sugar is between 1 and 10, preferably 1 to 6, in particular 1.1 to 3, most preferably 1.1 to 1.7, for example, C<sub>8-10</sub> alkyl 1,5-glucoside (DP of 1.5).

**[0047]** The alcohol ethoxyates are preferably used in amounts of up to 20% by weight, especially preferably 4 to 12% by weight, especially preferably 7 to 9% by weight. Moreover, additional nonionic surfactants such as fatty acid monoalkanolamides and/or alkyl polyglycosides may also be present in amounts of up to 10% by weight.

**[0048]** In addition to the types of surfactants mentioned above, the active ingredient preparation according to the invention may also contain cationic surfactants and/or amphoteric surfactants and/or zwitterionic surfactants.

**[0049]** Suitable amphoteric surfactants include, for example, betaines of the formula (R<sup>iii</sup>)(R<sup>iv</sup>)(R<sup>v</sup>)N<sup>+</sup>CH<sub>2</sub>COO<sup>-</sup>, in which R<sup>iii</sup> denotes an alkyl radical with 8 to 25 carbon atoms, preferably 10 to 21 carbon atoms, optionally

interrupted by heteroatoms or heteroatom groups, and  $R^{iv}$  and  $R^v$  denote similar or different alkyl radicals with 1 to 3 carbon atoms, in particular  $C_{10}$ - $C_{18}$  alkyl dimethylcarboxymethyl betaine and  $C_{11}$ - $C_{17}$  alkylamidopropyl dimethylcarboxymethyl betaine.

**[0050]** Suitable cationic surfactants include among others the quaternary ammonium compounds of the formula  $(R^{vi})(R^{vii})(R^{ix})N^+X^-$ , in which  $R^{vi}$  to  $R^{ix}$  stand for four similar or different alkyl radical, in particular two long-chain alkyl radicals and two short-chain alkyl radicals, and  $X^-$  stands for an anion, in particular a halide ion, for example, didecyl dimethylammonium chloride, alkylbenzyl didecylammonium chloride and mixtures thereof. Quaternary ammonium compounds with an antimicrobial action are preferred.

**[0051]** In addition to the components mentioned so far, additional ingredients that are typically used in toilet cleaning agents may also be present, preferably those selected from the group consisting of acids, bases, salts, thickeners, antimicrobial active ingredients, preservatives, chelating agents, polymers, colorants, active ingredients for reducing bad odors, perfumes boosters, fillers, builders, bleaching agents, corrosion inhibitors, rinse regulators, enzymes, microorganisms, active ingredients for biofilm removal, active ingredients for inhibiting lime deposition, active ingredient for reducing dirt adhesion, active ingredients for improving processability, active ingredients for reducing stickiness as well as mixtures thereof. On the whole, no more than 60% by weight of the additional ingredients should be present, preferably 0.01 to 60% by weight, in particular 0.2 to 15% by weight.

#### Acids

**[0052]** To reinforce the cleaning power with respect to lime and urine deposits, at least one of the active ingredient preparations may contain one or more acids and/or the salts thereof. The acids are preferably produced from renewable raw materials. Suitable acids therefore include in particular organic acids such as formic acid, acetic acid, citric acid, glycolic acid, lactic acid, succinic acid, adipic acid, malic acid, tartaric acid, and gluconic acid as well as mixtures thereof. In addition, however, the inorganic acids used may also be hydrochloric acid, sulfuric acid, phosphoric acid and nitric acid or amidosulfonic acid and/or mixtures thereof. The acids and/or their salts are especially preferably selected from the group consisting of citric acid, lactic acid, formic acid, salts thereof as well as mixtures thereof. They are preferably used in amounts of 0.01 to 10% by weight, especially preferably 0.2 to 5% by weight. This active ingredient is suitable in particular for the agent to be used in the chamber with the time delay device because the lime and urine deposit-dissolving effect of the acids should if possible persist even after the conclusion of the flushing operation.

**[0053]** In addition, the agents that can be used according to the invention contain in a preferred embodiment inorganic salts, preferably alkali or alkaline earth metal salts, in particular carbonates, sulfates, halides or phosphates as well as mixtures thereof. Sodium sulfate and/or sodium carbonate are especially preferably used here. Sodium sulfate may be used in an amount of up to 60% by weight, preferably 0.01 to 60% by weight, especially preferably 20 to 60% by weight, in particular 35 to 55% by weight. Sodium carbonate and additional salts may be present in an amount of up to 30% by weight, preferably up to 10% by weight, especially preferably up to 5% by weight.

#### Bases

**[0054]** In addition, alkalis may also be present in the agents that can be used according to the invention. The bases used are preferably those from the group alkali and alkaline earth metal hydroxide and carbonates, in particular sodium carbonate or sodium hydroxide. In addition, however, ammonia and/or alkanolamines with up to 9 carbon atoms in the molecule may also be used, preferably the ethanolamines, in particular monoethanolamine.

#### Antimicrobial Active Ingredients

**[0055]** Disinfection and sanitation are a special form of cleaning. In a corresponding special embodiment of the invention, the agent that can be used according to the invention contains one or more antimicrobial active ingredients, preferably in an amount of 0.01 to 5% by weight, preferably 0.02 to 4% by weight, in particular 0.1 to 3.5% by weight, especially preferably 0.5 to 3% by weight.

**[0056]** The terms disinfection, sanitation, antimicrobial effect and antimicrobial active ingredient have the usual meanings within the scope of the teaching according to the invention. Though disinfection in the narrower sense of medical practice is understood to refer to the destruction of infectious microorganisms (theoretically all of them), the term sanitation is understood to include extensive elimination of all microorganisms as much as possible (including the saprophytic microorganisms that are normally harmless for humans). The extent of disinfection and/or sanitation here depends on the antimicrobial effect of the agent used, which decreases with a decline in the amount of antimicrobial active ingredient and/or with increasing dilution of the agent for use.

**[0057]** For example, suitable antimicrobial active ingredients according to the invention are those from the groups of alcohols, aldehydes, antimicrobial acids and/or the salts thereof, carboxylic acid esters, acid amides, phenols, phenol derivatives, diphenyls, diphenylalkanes, urea derivatives, oxygen, nitrogen acetals and formals, benzamidines, isothiazoles and their derivatives such as isothiazolines and isothiazolinones, phthalimide derivatives, pyridine derivatives, antimicrobial surface-active compounds, guanidines, antimicrobial amphoteric compounds, quinolines, 1,2-dibromo-2,4-dicyanobutane, iodo-2-propylbutylcarbamate, iodide, iodophore, compounds that split off active carbon and peroxides. Preferred antimicrobial active ingredients are preferably selected from the group consisting of ethanol, n-propanol, isopropanol, 1,3-butanediol, phenoxyethanol, 1,2-propylene glycol, glycerol, undecylenic acid, citric acid, lactic acid, benzoic acid, salicylic acid, thymol, 2-benzyl-4-chlorophenol, 2,2'-methylene-bis-(6-bromo-4-chlorophenol), 2,4,4'-trichloro-2'-hydroxydiphenyl ether, N-(4-chlorophenyl)-N-(3,4-dichlorophenyl)urea, N,N'-(1,10-decanediyl-di-1-pyridinyl-4-ylidene)-bis-(1-octanamine) dihydrochloride, N,N'-bis-(4-chlorophenyl)-3,12-diimino-2,4,11,13-tetraazatetradecane diimide amide, antimicrobial quaternary surface-active compounds, guanidines and sodium dichloroisocyanurate (DCI, 1,3-dichloro-5H-1,3,5-triazine-2,4,6-trione sodium salt). Preferred surface-active quaternary compounds with an antimicrobial action contain an ammonium, sulfonium, phosphonium, iodonium or arsonium group. In addition, essential oils with an antimicrobial action that can also be used also provide a fragrance for the cleaning agent at the same time. However, especially preferred antimicrobial active ingredients are selected from the

group comprising salicylic acid, quaternary surfactants, in particular benzalkonium chloride, peroxy compounds, in particular sodium percarbonate, phthalimidoperoxyhexanoic acid or hydrogen peroxide, alkali metal hypochlorite, trichloroisocyanuric acid, sodium dichloroisocyanurate as well as mixtures thereof. Sodium dichloroisocyanurate is most especially preferred here.

#### Preservatives

**[0058]** Preservatives may also be present in the active ingredient preparations according to the invention. Essentially the substances already mentioned for the antimicrobial active ingredients may also be used as preservatives.

#### Chelating Agents

**[0059]** Complexing agents (INCI: chelating agents) are also known as sequestrants. These are ingredients capable of chelating and inactivating metal ions to prevent their negative effects on the stability or appearance of the agents, such as turbidity. On the one hand, it is important here to chelate calcium and magnesium ions which cause water hardness and are incompatible with numerous ingredients. On the other hand, chelating the ions of heavy metals such as iron or copper delays the oxidative decomposition of the finished agents. Furthermore, chelating agents support the cleaning effect.

**[0060]** For example, the following chelating agents, identified according to their INCI designations, are suitable: aminotrimethylene phosphonic acid, beta-alanine diacetic acid, calcium disodium EDTA, citric acid, cyclodextrin, cyclohexanediamine tetraacetic acid, diammonium citrate, diammonium EDTA, diethylenetriamine pentamethylene phosphonic acid, dipotassium EDTA, disodium azacycloheptane diphosphonate, disodium EDTA, disodium pyrophosphate, EDTA, etidronic acid, galactaric acid, gluconic acid, glucuronic acid, HEDTA, hydroxypropyl cyclodextrin, methyl cyclodextrin, pentapotassium triphosphate, pentasodium aminotrimethylene phosphonate, pentasodium ethylenediamine tetramethylene phosphonate, pentasodium pentetate, pentasodium triphosphate, pentetic acid, phytic acid, potassium citrate, potassium EDTMP, potassium gluconate, potassium polyphosphate, potassium trisphosphonemethylamine oxide, ribonic acid, sodium chitosan methylene phosphonate, sodium citrate, sodium diethylenetriamine pentamethylene phosphonate, sodium dihydroxyethyl glycinate, sodium EDTMP, sodium gluceptate, sodium gluconate, sodium glycereth-1 polyphosphate, sodium hexametaphosphate, sodium metaphosphate, sodium metasilicate, sodium phytate, sodium polydimethylglycinophenol sulfonate, sodium trimetaphosphate, TEA-EDTA, TEA polyphosphate, tetrahydroxyethyl ethylenediamine, tetrahydroxypropyl ethylenediamine, tetrapotassium etidronate, tetrapotassium pyrophosphate, tetrasodium EDTA, tetrasodium etidronate, tetrasodium pyrophosphate, tripotassium EDTA, trisodium dicarboxymethyl alaninate, trisodium EDTA, trisodium HEDTA, trisodium NTA and trisodium phosphate.

#### Polymers

**[0061]** At least one of the active ingredient preparations according to the invention may also contain polymers, which may serve to reduce the lime buildup as well as the redeposition of soiling (so-called soil-repellant polymers).

**[0062]** Preferred polymers are acrylic polymers such as those available commercially from the company Rhodia under the brand name Mirapol.

#### Colorants

**[0063]** The agent that can be used according to the invention contains one or more dyes (INCI: colorants) as additional ingredients. Both water-soluble and oil-soluble colorants may be used but, on the one hand, their compatibility with other ingredients, for example, bleaching agents, should be taken into account, while, on the other hand, the colorant used should not have a substantive effect with respect to toilet ceramics, even with lengthy exposure. It is preferable if the second active ingredient preparation comprises a water-soluble colorant that imparts color to the flush water, where a blue color is preferred. The flush water colored with this colorant remains present in a sufficient concentration in the toilet sump due to the after-running after the end of the actual flushing operation, i.e., it remains in the residual flush water standing in the toilet bowl to impart a color to it, preferably blue. The colorants are preferably present in an amount of 0.0001 to 0.1% by weight, in particular 0.0005 to 0.05% by weight, especially preferably 0.001 to 0.01% by weight.

**[0064]** In addition, active ingredients may be used to reduce or prevent bad odors, so-called malodor repellants. These are usually substances that adsorb, chelate, oxidize or form inclusion compounds with the volatile substances responsible for the bad odor, so that these substances are inactivated as odors (so-called deodorants), or they be may scents that mask the problematical bad odor with their own odor and thereby neutralize it (so-called odor improvers).

#### Builders

**[0065]** Water-soluble and/or water-insoluble builders may optionally be used in the agents that can be used according to the invention. Water-soluble builders are preferred because they usually have a lower tendency to leave insoluble residues on hard surfaces. Conventional builders, which might be present within the scope of the invention, include the low-molecular polycarboxylic acids and their salts, homopolymeric and copolymer polycarboxylic acids and their salts, citric acid and its salts, carbonates, phosphates and silicates. The water-insoluble builders include zeolites, which may also be used, as well as mixtures of the aforementioned builder substances.

#### Bleaching Agents

**[0066]** According to the invention, bleaching agents may be added to at least one of the active ingredient preparations. Suitable bleaching agents include peroxy compounds, in particular peroxides, per acids, percarbonates and/or perborates. Sodium percarbonate, phthalimidoperoxyhexanoic acid and hydrogen peroxide are especially preferred. Alkali metal hypochlorites such as sodium hypochlorite, however, are less suitable for cleaning agents having an acidic formulation because of the release of toxic chlorine gas vapors but they can be used in cleaning agents formulated to be alkaline. Trichloroisocyanuric acid and in particular sodium dichloroisocyanurate are also suitable. Under some circumstances, a bleach activator may also be necessary in addition to the bleaching agent.

### Corrosion Inhibitors

[0067] Suitable corrosion inhibitors (INCI: corrosion inhibitors) are, for example, the following substances according to the INCI names: cyclohexylamine, diammonium phosphate, dilithium oxalate, dimethylaminomethyl propanol, dipotassium oxalate, dipotassium phosphate, disodium phosphate, disodium pyrophosphate, disodium tetrapropenyl succinate, hexoxyethyl diethylammonium, phosphate, nitromethane, potassium silicate, sodium aluminate, sodium hexametaphosphate, sodium metasilicate, sodium molybdate, sodium nitrite, sodium oxalate, sodium silicate, stearamidopropyl dimethicone, tetrapotassium pyrophosphate, tetrasodium pyrophosphate, triisopropanolamine.

### Flush Regulators

[0068] The substances known as rinse regulators serve primarily to control the consumption of the agents during use, so that the intended lifetime is maintained. Suitable regulators preferably include solid long-chain fatty acids, such as stearic acid, but also the salts of such fatty acids, fatty acid ethanol amides, like coconut fatty acid monoethanolamide or solid polyethylene glycols, such as those with molecular weight between 10,000 and 50,000.

### Active Ingredients to Reduce Stickiness

[0069] To improve processability in production of solid toilet cleaning blocks that can be used according to the invention, in particular those in a spherical shape, an active ingredient may be added to reduce the stickiness. Thus, the addition of dolomite powder or titanium dioxide powder with a fine particle size distribution improves the processing behavior in the case of spherical shapes and greatly reduces abrasion and/or stickiness. The results with such active ingredients are better than those with other conventional measures, for example, coating the spheres with a lubricant, powdering or coating the forming rolls with Teflon.

### Enzymes

[0070] The agent may also contain enzymes, preferably proteases, lipases, amylases, hydrolases and/or cellulases. They may be added to the agent that can be used according to the invention in any form established in the prior art. These include solutions of the enzymes, advantageously in the highest possible concentration, with a low water content and/or mixed with stabilizers. Alternatively, the enzymes may be encapsulated, for example, by spray drying or extrusion of the enzyme solution together with a polymer, preferably a natural polymer, or in the form of capsules, for example, those in which the enzymes are enclosed in a solidified gel or in those of the core-shell type in which a core containing enzyme is coated with a protective layer impermeable to water, air and/or chemicals. In addition, other active ingredients, for example, stabilizers, emulsifiers, pigments, bleaches or colorants may be applied in supported layers. Such capsules are applied by known methods, for example, by shake or roll granulation or in fluid bed processes. Such granules advantageously have a low tendency to form dust, for example, due to the application of polymeric film-forming agents, and are stable in storage because of the coating.

[0071] In addition, enzyme stabilizers may also be present in enzyme-containing agents to protect an enzyme that is present in an agent according to the invention from damage,

such as inactivation, denaturing or decomposition, e.g., due to physical influences, oxidation or proteolytic cleavage. Depending on the enzyme used, suitable enzyme stabilizers include in particular benzamidine hydrochloride, borax, boric acids, boronic acids or salts thereof or esters, especially derivatives with aromatic groups such as substituted phenyl boronic acids and/or their salts or esters; peptide aldehydes (oligopeptides with reduced C terminus), amino alcohols such as mono-, di-, triethanol- and propanolamine and mixtures thereof, aliphatic carboxylic acids up to C<sub>12</sub> such as succinic acid, other dicarboxylic acids or salts of the aforementioned acids; end group-capped fatty acid amide alkoxyates; low aliphatic alcohols and in particular polyols, for example, glycerol, ethylene glycol, propylene glycol or sorbitol, as well as reducing agents and antioxidants such as sodium sulfite and reducing sugars. Other suitable stabilizers are known from the prior art. Combinations of stabilizers are preferably used, for example, the combination of polyols, boric acid and/or borax, the combination of boric acid or borate, reducing salts and succinic acid or other dicarboxylic acids or the combination of boric acid or borate with polyols or polyamino compounds and with reducing salts.

### Multilayer Toilet Cleaning Blocks

[0072] It is known from the prior art, for example, EP 791047 B1, that essentially solid toilet cleaning blocks can be produced from masses having various compositions, wherein one of the masses is partially or entirely enclosed by the other mass(es). Thus, for example, the interior mass may have a higher perfume concentration than the exterior compound in order to ensure a uniform fragrance impression with a decline in the mass of the ball during the duration of use, or the interior mass may contain a different fragrance than the exterior mass. In addition, other active ingredients may also be incorporated into different layers to be released at different times, depending on the degree of rinsing. Such a layered structure is also possible with the toilet cleaning block that can be used according to the invention.

[0073] In one embodiment of the invention, the second active ingredient preparation includes a surface treatment agent, preferably a soil-repellant active ingredient.

[0074] In another embodiment of the invention, the second active substance preparation includes an ingredient that dissolves lime and urine deposits, preferably one or more acids or salts. These can thus manifest their effect even after the end of the flushing operation.

[0075] In another embodiment of the invention, the second active ingredient preparation includes a bleaching agent. This is especially preferred when an active ingredient that is incompatible with bleach is present in the first active ingredient preparation, for example, an enzyme, a special fragrance, a color or other organic or polymeric active ingredients.

[0076] In a preferred embodiment of the invention, the second active ingredient preparation includes a water-soluble colorant for coloring the flush water. This is preferably a blue colorant, which remains in the toilet sump, i.e., in the residual flush water left standing in the toilet bowl in a sufficient concentration after the end of the actual flushing operation and imparts a blue color to the water. In this case, it is also preferable if additional active ingredients that are incompatible with the colorant, for example, bleaching agent or additional water-soluble colorants, are not present in this active

ingredient preparation but instead are present in the agent reserved in the first chamber (or in an additional chamber that may optionally be present).

**[0077]** In other embodiments of the invention, the second active ingredient preparation includes fragrances, clear rinses, substances to increase gloss, active ingredients to combat bad odors or foam boosters.

**[0078]** In a preferred embodiment of the invention, the first and second active ingredient preparations are present as solids in the accommodating container, as toilet blocks of any desired geometric shape (also referred to as toilet bricks). The preferred shape of the toilet blocks is rotationally symmetrical, in particular spherical, to also adjust a particularly favorable ratio of volume to surface area for the toilet block. This is especially favorable in a chamber with a time delay device. For example, if the second chamber has a time delay device, in particular a siphon, then the chamber remains filled with flush water at a certain level for a longer period of time. Consequently, a spherical toilet block has a low contact with the flush water in the chamber in the lower region and thus is not dissolved unnecessary.

**[0079]** In one embodiment of the invention, the accommodating container includes at least one wall, which separates the first chamber from the second chamber and optionally additional chambers. This ensures that the active ingredient preparations, which are in the at least one first chamber and the at least one second chamber and are optionally incompatible, do not come in contact, so that, for example, unwanted reactions between the individual active ingredient preparations are also a transfer of color between the chambers can be prevented.

**[0080]** In a special embodiment of the invention, the second chamber is designed centrally inside the accommodating container. For example, the second chamber is enclosed by the first chamber on one side and by an additional chamber on the other side. It is of course also possible to design additional chambers as needed.

**[0081]** It is particularly preferred for the first chamber and the second chamber, which form the accommodating container, to be linked to one another, more preferably to be designed in one piece.

**[0082]** The accommodating container is held by the holder on the toilet bowl, so that in the use position it is situated with the chambers beneath the holder. The holder is preferably designed as a bow-shaped hanging holder, for example.

**[0083]** In addition, the accommodating container is preferably made of plastic such as, for example, PET or PP. It is also preferable for the accommodating container to have a transparent design in order to ensure insight into the chambers that are filled with active ingredient preparation at one glance. In a refinement of the invention, the accommodating container is transparent or translucent and has a color, preferably blue.

**[0084]** The first, second and additional chambers, if any, are preferably not subdivided further. This is especially preferable when the chambers are each designed to adapt to the geometry of a toilet block. A very compact design is achieved in this way.

**[0085]** The invention is explained in greater detail below on the basis of the drawings as examples. These examples do not exhaustively describe all possible devices that would conform to the invention, which the skilled person can carry out with the help of the description. It is important that the chambers are designed, so that the first active ingredient prepara-

tion and the second active ingredient preparation are dispensed into the toilet bowl at staggered intervals. In the figures:

**[0086]** FIG. 1A shows a perspective view of the device wherein the device is shown as open and without active ingredient preparations.

**[0087]** FIG. 1B shows a section through a device according to the invention along the sectional plane A-A from FIG. 1.

**[0088]** FIG. 2 shows a device according to the invention with active ingredient preparations, wherein the time delay device is a siphon.

**[0089]** FIG. 3 shows another device according to the invention with active ingredient preparations, wherein the time delay device is a siphon.

**[0090]** FIG. 1A shows a perspective view of the device 1 according to the invention, wherein the device 1 is shown as open and without active ingredient preparations. FIG. 1B shows a section of the same device 1 with toilet blocks, which include the active ingredient preparations 5 and 6, which need not necessarily be rectangular and are preferably spherical. The device 1 is expediently hung on the toilet bowl by a hanger 12. However, other known fastening variants are also possible. The device 1 comprises an accommodating container with a first chamber 3 and a second chamber 4. The first chamber 3 comprises inlet openings 7 and outlet openings 9. The outlet openings 9 are designed so that overflowing flush water which flows through the inlet can flow out into the toilet bowl through the outlet openings 9 essentially without any time delay. The second chamber 4 comprises at least one inlet opening 8 and a time delay with an outlet opening 10. The time delay device 11 is a pipe, which protrudes into the second chamber 4. When flush water runs into the second chamber 4, it fills up to the inner end of the pipe before it can run out through the pipe 11. After the flushing operation, residual water remaining inside the second chamber evaporates slowly.

**[0091]** Although the device 1 is shown as angular inside of FIGS. 1A-B, other shapes are also possible for the accommodating container 2. Additional chambers may also be provided as needed. The wall 13 is preferably present, but it is more preferable for the accommodating container 2 to have a lid for the wall 13 to extend from the bottom to the lid thus separate the first chamber 3 from the second chamber 4.

**[0092]** FIG. 2 shows a perspective view of a device 1 according to the invention. The device 1 is expediently hung by a hanger 12 on the toilet bowl. Other known fastening variants are also possible as an alternative. The device 1 comprises an accommodating container 2 with a first chamber 3 and a second chamber 4. The first and second chambers are preferably rotationally symmetrical, in particular spherical, and comprise toilet blocks which contain the active ingredient preparations 5 and 6. These toilet blocks are also preferably rotationally symmetrical, in particular spherical. The first chamber 3 comprises inlet openings 7 and outlet openings 9. The outlet openings 9 are designed so that overflowing flushing which flows through the inlet openings 7 can flow out into the toilet bowl through the outlet opens 9 essentially without any time delay. The second chamber 4 comprises at least one inlet opening 8 and a time delay device 11 with an outlet opening 10. The time delay device 11 is designed here as a siphon 11 which protrudes into the second chamber 4. When flush water flows into the second chamber, it flows until the outlet threshold level is full. Then the flush water begins to flow out through the siphon until reaching the cutoff threshold

level. It is especially preferred that the siphon is designed so that the second chamber 4 essentially runs empty. Other chambers may also be present as needed. A wall is preferably present, separating the first chamber 3 from the second chamber 4.

[0093] FIG. 3 shows perspective view of a device 1 according to the invention. This device is preferably made of a transparent plastic, except for the siphon 11 and outlet 10, only the external contour is shown for the sake of simplicity of the illustration. The device is preferably fastened to the toilet bowl in the manner already described above (fastening not shown). The device 1 comprises an accommodating container 2 with a first chamber 3, a second chamber 4, and another chamber 14. The first, second and additional chambers 3, 4, 14 are preferably rotationally symmetrical, especially spherical and comprise suitably shaped toilet blocks containing the active ingredient preparations (not shown in the figures). These toilet blocks are also preferably rotationally symmetrical, especially spherical. The first chamber 3 comprises inlet openings 7 and outlet openings 9. The outlet openings 9 are preferably designed so that overflowing flush water which flows through the inlet openings 7 can flow out through the outlet openings 9 into the toilet bowl essentially without a time lag. The second chamber 4 comprises at least one inlet opening 8 and a time delay device 11 with one outlet 10. The time delay device 11 is designed here as a siphon 11 which protrudes into the second chamber 4. When flush water flows into the second chamber 4, it fills up to the deployment threshold level. Then the flush water begins to flow out through the siphon 11 until the termination threshold level has been reached. It is especially preferable for the siphon 11 to be designed so that the second chamber 4 essentially runs empty. Additional chambers may also be present as needed. Walls 13 are preferably present, separating the chambers 3, 4, 14 from one another.

#### Exemplary Embodiment

[0094] Solid water-soluble toilet active ingredient preparations (so-called toilet cleaning blocks or toilet bricks) were formulated according to the skeleton formulations given in the following table. E1 and E2 each comprise two different compositions, one of which should release its active ingredient at staggered intervals. The quantitative amounts are given in percent by weight of the active ingredient, based on the respective toilet block.

	E1		E2	
	Blue	Yellow	Blue	White
Linear alkylbenzene sulfonate	10-30	10-30	10-30	10-30
$\alpha$ -Olefin sulfonate	10-25	10-25	10-25	10-25
Fatty alcohol ethoxylate	5-15	5-15	5-15	1-15
Trisodium citrate dihydrate	0.1-3	0.1-3	0.1-3	0.1-3
Perfume	0.1-8	0.1-8	0.1-8	0.1-8
Water-soluble colorant, blue	0.5-8	—	0.5-8	—
Colorant, yellow	—	0.001-1	—	—
Titanium dioxide	—	—	—	0.1-1
Sodium dichloroisocyanurate	—	—	—	0.1-5
Sodium lauryl sulfate	—	—	—	1-8
Paraffin oil	0-2	0.2	0-2	0-2
Dipropylene glycol	0-2	0.2	0-2	0-2
Water	0-2	0.2	0-2	0-2
Sodium sulfate	20-60	20-60	20-60	20-60

[0095] In a device according to FIG. 2, the block characterized as “blue” from E1 and/or E2 was placed in the second chamber and the block labeled as “yellow” or “white” was placed in the first chamber. The “blue” block contained a water-soluble blue colorant. In E1 the yellow block contained foaming surfactants. In E2 the white block also contained the bleaching agent sodium isocyanurate. The devices according to E1 and E2 were each fastened in a toilet bowl according to the standard EN 997 (2003+A1:2006) class 1 with a flushing volume of 8-10 L. When flushing, it was observed that foam would form in the toilet bowl at the start of the flushing operation and 1 s to the start of flushing blue-colored flush water with an active ingredient-containing solution began to flow out of the second chamber. At the end of flushing, the dispensing of flush water with the active ingredient-containing solution from the first chamber also stopped, but the dispensing of flush water with solution containing the active ingredient from the second chamber persisted for approximately 4-6 s and thus colored the remaining water in the toilet bowl blue.

[0096] While at least one exemplary embodiment has been presented in the foregoing detailed description of the invention, it should be appreciated that a vast number of variations exist. It should also be appreciated that the exemplary embodiment or exemplary embodiments are only examples, and are not intended to limit the scope, applicability, or configuration of the invention in any way. Rather, the foregoing detailed description will provide those skilled in the art with a convenient road map for implementing an exemplary embodiment of the invention, it being understood that various changes may be made in the function and arrangement of elements described in an exemplary embodiment without departing from the scope of the invention as set forth in the appended claims and their legal equivalents.

What is claimed is:

1. A device (1) for dispensing active ingredient preparations (5, 6) into a toilet bowl, with an accommodating container (2) to be arranged in the toilet bowl, wherein the accommodating container (2) can be fastened on the toilet bowl, wherein the accommodating container (2) comprises at least one first chamber (3) and one second chamber (4) wherein the first chamber (3) dispenses a first active ingredient preparation (5) into the toilet bowl when overflowed by flush water, and the second chamber (4) dispenses a second active ingredient preparation (6) into the toilet bowl on being overflowed by flush water, wherein the chambers first chamber (3) and second chamber (4) are designed so that the first active ingredient preparation (5) and the second active ingredient preparation (6) are dispensed into the toilet bowl at staggered intervals between them with the same overflow.

2. The device according to claim 1, wherein the device includes a time delay device for dispensing at least one active ingredient preparation into the toilet bowl with a time lag in comparison with a flushing operation.

3. The device according to claim 1, wherein the accommodating container (2) comprises a wall (13) which separates the first chamber (3) from the second chamber (4).

4. The device according to claim 1, wherein the second chamber (4) is disposed centrally in the accommodating container (2).

5. The device according to claim 1, wherein the first chamber (3), the second chamber (4) and, if present, additional chambers (14) are linked to one another.

6. The device according to claim 1, wherein at least one chamber of the first chamber (3) and the second chamber (4) comprises a time delay device (11).

7. The device according to claim 6, wherein the second chamber comprises a time delay device.

8. The device according to claim 6, wherein the at least one chamber of the first chamber (3) and the second chamber (4) having the time delay device (11) has at least one outlet opening which has a smaller total cross section in comparison with outlet opening(s) in chambers without a time delay device (11).

9. The device according to claim 6, wherein the time delay device (11) is a pipe, which is preferably arranged on the bottom of the chamber (4) and also preferably protrudes into the chamber (4).

10. The device according to claim 6, wherein the time delay device (11) is a siphon.

11. The device according to claim 1, wherein the second active ingredient preparation (6) comprises an active ingredient, which manifests its effect mainly after the flushing operation and is dosed.

12. The device according to claim 1, wherein the second active ingredient preparation (6) comprises an active ingredient which manifests its effect mainly during a flushing operation.

13. The device according to claim 1, wherein the second active ingredient preparation (5) comprises a surface treatment agent.

14. The device according to claim 13, wherein the surface treatment agent is a soil-repellant active ingredient.

15. The device according to claim 1, wherein the second active ingredient preparation (6) comprises a bleaching agent or an antimicrobial active ingredient.

16. The device according to claim 1, wherein the second active ingredient preparation (6) comprises a water-soluble colorant.

17. The device according to claim 1, wherein first active ingredient preparation and the second active ingredient preparation are present as solids in the accommodating container (2).

\* \* \* \* \*