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(72) Inventors:

• **Papadaki, Maria**

**1860 Meise (BE)**

• **Tomarchio, Vincenzo**

**1050 Brussel (DE)**

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(74) Representative: **Kellenberger, Jakob et al**

**Procter & Gamble Services Company NV,**

**Temselaan 100**

**1853 Strombeek-Bever (BE)**

(71) Applicant: **THE PROCTER & GAMBLE COMPANY**  
**Cincinnati, Ohio 45202 (US)**

(54) **A lavatory bowl rim-block**

(57) The present invention encompasses a lavatory bowl rim-block dispensing a solution comprising gellan gum onto a lavatory bowl surface, and a process of cleaning a lavatory bowl surface with said lavatory bowl rim-block.

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**Description**Technical field

5 **[0001]** The present invention relates to lavatory bowl rim-blocks.

Background

10 **[0002]** A great variety of ways to clean lavatory bowls, such as toilet bowls, has been described in the art. One particular way of cleaning lavatory bowls, such as toilet bowls, are so called rim-blocks. Indeed, rim-blocks are devices that dispense liquid or solid compositions directly into a lavatory bowl from under the rim of said bowl. Such rim-blocks are usually attached by various means, such as hooks and the like, to the rim of the lavatory bowl. Every time a toilet equipped with a rim-block is flushed, an amount of composition is dispensed into the lavatory bowl. Liquid and solid rim-blocks are already known in the art.

15 **[0003]** The present invention relates to so-called liquid rim-blocks, this means the composition to be released into the lavatory bowl are in liquid form.

**[0004]** Examples of liquid rim-blocks known in the art include a liquid rim-block device having a suspension means and at least two compartments for active substances (WO 02/40792), or a lavatory cleaning system comprising a dispenser for dispensing a liquid composition from under the rim of a lavatory bowl, wherein the composition has a viscosity of greater than 2500 mPa s (WO 02/04951). Other similar systems are described in EP 775741 or WO 01/94520.

**[0005]** Even though, the currently known lavatory bowl rim-blocks according to the above cited art provide a good performance with regard to cleaning performance, it has been found by consumer research that the currently known lavatory bowl rim-blocks tend to show a leakage problem upon use.

25 **[0006]** Indeed, it is highly desirable, that the active composition of a lavatory bowl rim-block is only dispensed upon flushing of the lavatory bowl. Once, the lavatory bowl is flushed, the active composition should be retained in the lavatory rim-block until the next flushing operation. However, existing lavatory bowl rim-blocks tend to leak the active compositions in-between the flushing of the lavatory bowls. This leakage leads to an increased consumption of the active composition as well as to unsightly staining of the lavatory bowl.

30 **[0007]** Prevention of leakage, e.g., by increasing the viscosity of the active composition of a lavatory bowl rim-block, may lead to a reduced dispensing of the active composition upon flushing of the lavatory bowl, which is not desirable. Indeed, this would reduce the cleaning performance of the lavatory rim-block.

**[0008]** It is therefore an objective of the present invention to provide a lavatory bowl rim-block comprising at least one liquid composition, wherein leakage upon use (i.e., while suspended from a lavatory bowl) is reduced or even prevented, whilst maintaining the delivery performance upon flushing of the lavatory bowl (i.e., good product release upon flushing). By "leakage" it is meant herein, unwanted delivery of said at least one liquid composition in-between flushing of the lavatory bowl.

**[0009]** It has now been found that the above objective can be met by a lavatory bowl rim-block according to the present invention.

40 **[0010]** Advantageously, the lavatory bowl rim-blocks as described herein may be used to clean surfaces made of a variety of materials like glazed and non-glazed ceramic tiles, enamel, stainless steel, Inox®, Formica®, vinyl, no-wax vinyl, linoleum, melamine, glass, plastics and plastified wood.

**[0011]** A further advantage of the present invention is that the compositions according to the present invention have the ability to provide long lasting shine to the surface they have cleaned.

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Summary of the invention

**[0012]** The present invention encompasses a lavatory bowl rim-block comprising : at least one liquid composition; and a dispenser, said dispenser comprising at least one container and a dispensing means connected to said containers) for dispensing said liquid composition onto a lavatory bowl surface; wherein said liquid composition comprises gellan gum.

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Detailed description of the inventionSurfaces to be cleaned

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**[0013]** The lavatory bowl rim-block herein is used to clean the surface or at least parts thereof of a lavatory bowl, such as a toilet bowl, urinals and the like. Preferably, the lavatory bowl rim-block herein is used to clean the surface

or at least parts thereof of the inside portion of a lavatory bowl, such as a toilet bowl, urinals and the like. More preferably, the lavatory bowl rim-block herein is used to clean at least parts of the inside portion of a toilet bowl or a urinal, preferably a toilet bowl.

**[0014]** The lavatory bowl rim-block herein may be used to clean lavatory bowl surfaces made of different materials like ceramic, enamel, vinyl, no-wax vinyl, linoleum, melamine, glass, Inox®, Formica®, any plastics, plastified wood, metal or any painted or varnished or sealed surface and the like.

#### Lavatory bowl rim-block

**[0015]** The lavatory bowl rim-block herein comprises : at least one liquid composition; and a dispenser, said dispenser comprising at least one container and a dispensing means connected to at least one of said container(s) for dispensing a liquid composition onto a lavatory bowl surface.

**[0016]** In a preferred embodiment herein, the lavatory bowl rim-block herein dispenses a single liquid composition or a combination of liquid compositions onto a lavatory bowl surface. Preferably, the lavatory bowl rim-block herein dispenses at least one liquid composition from the rim portion of a lavatory bowl onto the lavatory bowl surface.

**[0017]** The lavatory bowl rim-block herein is preferably designed such that a sufficient amount of the liquid composition herein is transferred to the lavatory bowl upon flushing of the lavatory bowl with water.

**[0018]** In a preferred embodiment, the lavatory bowl rim-block herein is a toilet rim-block.

#### The dispenser

**[0019]** The lavatory bowl rim-block of the present invention is preferably made of two main parts : a) at least one liquid composition; and b) a dispenser. Said dispenser of the lavatory bowl rim-block comprises at least one container and a dispensing means connected to at least one of said container(s) for dispensing a liquid composition (or a combination of liquid compositions) onto a lavatory bowl surface. The at least one liquid composition is contained in the at least one container of the dispenser.

**[0020]** The container herein may be any suitable container to hold a liquid composition. Indeed, suitable containers herein include, but are not limited to bottles, jars, pouches, boxes, sachets and the like. Preferably, said container has at least one opening. The container is preferably made by blow molding of thermoplastic material, more preferably a material selected from group consisting of Polyethylene Terephthalate (PET), Polyethylene Terephthalate-G (PETG), Polyvinyl Chloride (PVC), Polypropylene (PP), Polystyrene (PS), High Impact Polystyrene (HIPS), Polyvinylidene Chloride (PVDC), and mixtures thereof.

**[0021]** In a preferred embodiment herein, the container of the lavatory bowl rim-block is refillable and/or replaceable. Indeed, the container as a whole may be replaced once it is empty (replaceable) or the composition may be refilled into the existing container. The container may be refilled through an aperture in the container with the composition provided in a separate container, such as a bottle.

**[0022]** The dispensing means herein may be any suitable means to dispense the liquid composition herein onto a lavatory bowl surface. The lavatory bowl rim-block may comprise one or a multitude of dispensing means. Suitable means to dispense at least one liquid composition onto a lavatory surface are apertures, spray heads, trays, pads with or without capillary channels, plates with or without capillary channels, blotter type dispensing means such as described in EP 775 741, and the like. In the preferred embodiment wherein the lavatory bowl rim-block herein is used to clean the inside portion of a lavatory bowl or at least parts thereof, the dispensing means herein comes into contact with water used to flush said lavatory bowl. In this preferred embodiment, the water used to flush said lavatory bowl mixes with at least one liquid composition of the lavatory bowl rim-block herein and thereby delivers the composition(s) onto the lavatory bowl surface. The dispensing means herein is connected to at least one of said container(s) by any suitable means, such as pipes, tubes, and the like, and may further contain valves, mixing chambers, shutters, and the like.

**[0023]** The dispenser as described above may comprise other elements such as : an attachment means; a supporting structure, holding the different elements of the dispenser together; blinds, used for aesthetics or to regulated water flow; wings, used to regulated water flow; etc. In a preferred embodiment herein, the lavatory bowl rim-block, preferably said dispenser, additionally comprises an attachment means. Said attachment means is used to connect the lavatory bowl rim-block, preferably the dispenser, to said lavatory bowl and hold it in place over its lifetime. Suitable attachment means are selected from the group consisting of : hooks, a suction cup or a set thereof, an adhesive, and mixtures thereof. Preferably said attachment means attaches the dispenser to the rim or suspends the dispenser from said rim. In a preferred embodiment said attachment means is a hook to suspend the dispenser from the rim of a lavatory bowl.

**[0024]** Preferably, the dispenser herein additionally comprises an attachment means. More preferably, the dispenser herein additionally comprises an attachment means and a supporting structure.

**[0025]** In a preferred embodiment of the present invention, wherein the lavatory bowl rim-block comprises one container, the lavatory bowl rim-block comprises one liquid composition comprising all the essential ingredients of said

composition ("single compartment liquid rim-block" or "single compartment dispenser").

**[0026]** In another preferred embodiment herein, wherein the lavatory bowl rim-block comprises more than one container, preferably two to four, more preferably two to three, most preferably two containers, the essential ingredients of the liquid composition(s) (hereinafter "essential ingredients") of the lavatory bowl rim-block, may be present together in one and the same liquid composition contained in one of the container or these essential ingredients of the composition(s) of the lavatory bowl rim-block, may be in separate compositions contained in different containers, wherein preferably one of said separate compositions is a liquid composition and the other composition(s) are liquid, fluid gel, gel or solid compositions more preferably the other composition(s) are liquid compositions.

**[0027]** In the case where the essential ingredients of the composition(s) of the lavatory bowl rim-block, are in separate compositions contained in different containers, the compositions containing the essential ingredients are dispensed as a combination of compositions. By "combination of compositions" it is meant that the various compositions comprising the essential ingredients are mixed or at least combined : prior to being dispensed, e.g., in a mixing chamber, if any, or the dispensing means; during the dispensing, e.g., on the dispensing means; or after being dispensed, on the lavatory surface itself (this means in the flushed water). Indeed, at least the containers containing essential ingredients are connected to the dispensing means or a multitude thereof in way that the compositions containing the essential ingredients are dispensed onto said lavatory bowl surface.

**[0028]** In the embodiment of the present invention, wherein the lavatory bowl rim-block comprises at least one solid and/or gel composition(s), it may be necessary for the flush water to dissolve or wash away said solid and/or gel composition(s). This can be achieved by, e.g., providing a container containing said solid and/or gel composition(s) that is water permeable using openings, slits, and the like, or even water soluble.

**[0029]** In the preferred embodiment, wherein the lavatory bowl rim-block comprises more than one container, as described above, the container(s) not comprising essential ingredients are not necessarily used to dispense compositions onto said lavatory bowl surface, however it is in the scope of the present invention that such a container(s) also dispense compositions onto the lavatory bowl surface. Indeed, such a container(s) may contain compositions, such as perfumes and the like, that are dispensed into the air. Furthermore, such containers may contain liquid and/or solid compositions.

**[0030]** Suitable dispensers for use in the lavatory bowl rim-block as described herein are for example described in WO 01/44591, WO 99/66140, GB 2345494, WO 99/15375, WO 00/49238, GB 2358028, WO 95/38637, WO 01/77451, WO 00/42261, WO 01/06067, EP 538957, US 6,230,334, EP 1046756 and WO 01/02653.

#### Composition(s)

**[0031]** At least one of the compositions of the lavatory bowl rim-block as described herein is formulated as liquid compositions). The term liquid composition encompasses aqueous, thickened, fluid gel, gel and pasteous composition.

**[0032]** In a preferred embodiment herein, the composition herein is a thickened composition. The thickened composition herein may be in the form of a fluid gel, gel or a pasteous composition.

**[0033]** If more than one composition is present in the lavatory bowl rim-block herein, said compositions may have different rheologies and/or pH. Indeed, preferably one of said separate compositions is a liquid composition and the other composition(s) are liquid, fluid gel, gel or solid compositions more preferably the other composition(s) are liquid compositions.

**[0034]** Preferably, the thickened composition herein is a fluid gel. By a "fluid gel" it is meant herein a weak gel structure that exhibits an apparent yield stress, this means that a finite stress must be exceeded before the system will flow.

**[0035]** Without being bound by theory, it is believed that these fluid gel properties, preferably provided by the gellan gum present in the composition, contribute to the reduction or prevention of leakage and helps maintain the excellent product release from the dispenser. Provided the stress exerted by the action of gravity on the composition present in the container of the lavatory rim-block herein is less than the yield stress, leakage of the composition is reduced or even prevented, due to the fact that the composition does not flow. Upon flushing of the lavatory bowl equipped with a lavatory rim-block according to the present invention, the flush-water enters through the dispensing means into the dispenser and exert sufficient yield stress onto the composition to release said composition from the container (i.e., the composition flows). In addition, fluid gels are also highly pseudoplastic, which means low viscosity at higher levels of shear. The pseudoplastic properties of the composition herein contribute to maintain excellent product release from the dispenser. Furthermore, the fluid gel makes compositions very good for suspending particulate matter. It is the weak gel structure that gives gellan gum fluid-gels excellent prevention of leakage as well as suspending ability. It is possible to quantify this structure using Dynamic Mechanical Spectroscopy. This method gently oscillates the sample and from the response measures the degree of structure (storage modulus  $G'$  in Pa).

**[0036]** The preferred thickened composition of the present invention has a viscosity from 100 to 50000 cps at 50  $\text{sec}^{-1}$  and a viscosity of from 5000 to 50000 at 0.01  $\text{sec}^{-1}$ , more preferably of from 100 to 1000 cps at 50  $\text{sec}^{-1}$ , and still more preferably of from 100 to 600 cps at 50  $\text{sec}^{-1}$  and a viscosity of 6000-30000 cps at 0.01  $\text{sec}^{-1}$  at 20°C when

measured with a Carri-Med Rheometer model CSL<sup>2</sup> 100® (Supplied by TA Instruments) with a 4 cm conic spindle in stainless steel (linear increment from 0.01 to 100 sec<sup>-1</sup> in max. 8 minutes).

**[0037]** An alternative means to express the rheological properties of the composition herein is done by performing a creep test, wherein yield stress (at 0.05 Pa) is applied to a sample and deformation or strain on the sample is measured. Preferred thickened composition of the present invention has a viscosity after 10 min of creep of more than 20000 cps.

**[0038]** It is at these preferred viscosities where the thickened composition herein shows a good distribution of the composition over the surface to be cleaned as well as an adherence to said surface sufficient to stick to the surface during the cleaning operation itself.

**[0039]** The preferred liquid composition herein comprises water in an amount of from 0.01% to 90%, even more preferably of from 2% to 70% and most preferably 5% to 60% by weight of the total composition.

**[0040]** In another preferred embodiment, the liquid composition herein is substantially free of water, preferably free of water. By "substantially free of water" it is meant that no water as such is added to the liquid composition(s). However, said liquid composition(s) may comprise traces of water added into the composition(s) through the raw-materials used to produce the liquid composition(s). The level of water added into the composition(s) through the raw-materials used to produce the liquid composition(s) is preferably below 10%, more preferably below 5%, even more preferably below 3% by weight of the total composition.

**[0041]** The pH of the liquid composition according to the present invention may typically be from 0 to 14.

**[0042]** Preferably, the pH of the liquid composition herein, as is measured at 25°C, is at least, with increasing preference in the order given, 2, 3, 4, 5, or 5.9. Independently, the pH of the liquid composition herein, as is measured at 25°C, preferably is no more than, with increasing preference in the order given, 14, 13, 12, 11, 10, 9, 8, 7 or 6.1. Accordingly, the compositions herein may further comprise an acid or base to adjust pH as appropriate.

**[0043]** Acidity, if present, may further contribute to formulate the composition herein that exhibits good limescale removing performance whilst exhibiting also good disinfecting properties.

**[0044]** Suitable acids herein may be organic and/or inorganic acids. Particularly suitable organic acids to be used herein are aryl and/or alkyl sulfonate, such as methane sulphonic acids, citric acid, succinic acid, sulphamic acid, maleic acid and the like. Particularly suitable inorganic acids are sulfuric, phosphoric, nitric acids and the like.

**[0045]** A typical level of acid, when present, is of from 0.0001% to 15%, preferably from 0.001% to 10% and more preferably from 0.01% to 7% by weight of the total composition.

**[0046]** Suitable bases for use herein are the caustic alkalis, such as sodium hydroxide, potassium hydroxide and/or lithium hydroxide, and/or the alkali metal oxides such, as sodium and/or potassium oxide or mixtures thereof. A preferred base is a caustic alkali, more preferably sodium hydroxide and/or potassium hydroxide.

**[0047]** Other suitable bases include ammonia, ammonium carbonate and hydrogen carbonate.

**[0048]** Typical levels of a base, when present, are of from 0.001% to 5% by weight, preferably from 0.01% to 3% and more preferably from 0.1% to 2% by weight of the composition.

#### Gellan Gum

**[0049]** The liquid composition herein comprises gellan gum as an essential ingredient.

**[0050]** Gellan gum is a polysaccharide manufactured by microbial fermentation of the *Sphingomonas Elodea* Micro-organism and has a mol. wt. of between 400'000 and 1'000'000. Gellan gum is used to preferably form a fluid gel structure of the liquid composition according to the present invention.

**[0051]** The liquid composition herein may comprise from 0.001% to 1%, preferably from 0.005% to 0.5%, more preferably from 0.001% to 0.2% by weight of the total composition of gellan gum.

**[0052]** Gellan gum is for example commercially available under the trade name Kelcogel from CPKelco.

**[0053]** In a preferred embodiment herein, the gellan gum herein is a low acyl gellan gum, preferably the acyl content of the gellan gum herein is below 5%, more preferably below 3%, still more preferably below 2%, yet still more preferably below 1.5% and most preferably below 1%.

**[0054]** It has been found the use of gellan gum prevents leaking of the liquid composition from the dispenser onto the lavatory bowl surface. This leakage would be observable by consumers during the in-between flushes intervals due to the coloring, if any, of the liquid composition. Gellan gum prevents leakage on the lavatory bowl without negatively affecting product release from the dispenser by providing a yield value on the fluid (e.g., the fluid behaves as a solid at very low stresses). This may be due to the fluid gel properties (as discussed herein above), of gellan gum-containing compositions.

#### Processes

**[0055]** The present invention encompasses a process of cleaning a lavatory bowl surface with a lavatory bowl rim-

block according to the present invention, wherein said process comprises the step of applying a liquid composition (or a combination of liquid compositions) onto a lavatory bowl surface.

**[0056]** Preferably, said application of a liquid composition (or a combination of liquid compositions) onto a lavatory bowl surface is done upon flushing said lavatory bowl surface with water.

**[0057]** In said process of cleaning a lavatory bowl surface with a lavatory bowl rim-block according to the present invention the liquid composition is applied onto said lavatory bowl surface in diluted form.

**[0058]** By "in its diluted form" it is meant herein that said composition may be diluted with water up to 120.000x dilution level, preferably between 50.000x to 80.000x, more preferably 10.000x to 60.000x, even more preferably 10.000x to 55.000x, and most preferably 20.000x to 50.000x dilution level. Said dilution occurs upon application of the liquid composition herein or the combination of the liquid compositions herein to said surface.

**[0059]** The concentrations and levels (in %) of the different compounds present in the composition herein are given prior to any dilution of said composition upon dispensing of the composition.

**[0060]** Furthermore, the present invention encompasses the manufacture of a composition for use in one of the processes as described herein above.

#### Optional ingredients in the compositions herein

##### Chelant

**[0061]** The liquid composition according to the present invention may further comprise a chelant as an optional but highly preferred ingredient.

**[0062]** Chelants are preferred optional ingredients of the present invention, as it has been found that the presence of a chelant herein significantly reduces the mineral deposition on the lavatory bowl surface by chelating ions of the mineral deposition.

**[0063]** Suitable chelants may be any of those known to those skilled in the art, such as the ones selected from the group comprising phosphonate chelants, amino carboxylate chelants, other carboxylate chelants, polyfunctionally-substituted aromatic chelants, ethylenediamine N,N'-disuccinic acids, or mixtures thereof.

**[0064]** Suitable phosphonate chelants to be used herein may include ethane 1-hydroxy diphosphonates (HEDP) or salts thereof, alkylene poly (alkylene phosphonate), as well as amino phosphonate compounds, including amino aminotri(methylene phosphonic acid) (ATMP), nitrilo trimethylene phosphonates (NTP), ethylene diamine tetra methylene phosphonates, and diethylene triamine penta methylene phosphonates (DTPMP). The phosphonate compounds may be present either in their acid form or as salts of different cations on some or all of their acid functionalities. Preferred phosphonate chelants to be used herein are diethylene triamine penta methylene phosphonate (DTPMP) and ethane 1-hydroxy diphosphonate (HEDP). Such phosphonate chelants are commercially available from Monsanto under the trade name DEQUEST®.

**[0065]** Preferably, the chelant herein is a phosphonate chelant or a mixture thereof. More preferably, the chelant herein is selected from the group consisting of ethane 1-hydroxy diphosphonates (HEDP) or salts thereof, alkylene poly (alkylene phosphonate), as well as amino phosphonate compounds, including amino aminotri(methylene phosphonic acid) (ATMP), nitrilo trimethylene phosphonates (NTP), ethylene diamine tetra methylene phosphonates, and diethylene triamine penta methylene phosphonates (DTPMP) and mixtures thereof. Most preferably, the chelant herein is ethane 1-hydroxy diphosphonate (HEDP) or a salt thereof.

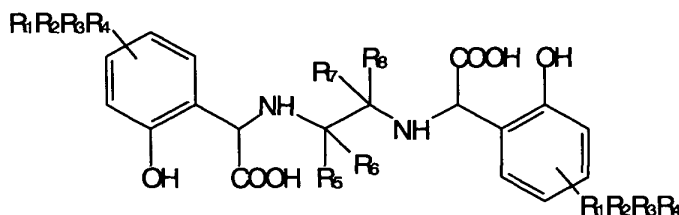
**[0066]** Polyfunctionally-substituted aromatic chelants may also be useful in the compositions herein. See U.S. patent 3,812,044, issued May 21, 1974, to Connor et al. Preferred chelants of this type in acid form are dihydroxydisulfobenzenes such as 1,2-dihydroxy -3,5-disulfobenzene.

**[0067]** A preferred biodegradable chelant for use herein is ethylene diamine N,N'- disuccinic acid, or alkali metal, or alkaline earth, ammonium or substitutes ammonium salts thereof or mixtures thereof. Ethylenediamine N,N'- disuccinic acids, especially the (S,S) isomer, have been extensively described in US patent 4, 704, 233, November 3, 1987, to Hartman and Perkins. Ethylenediamine N,N- disuccinic acid is, for instance, commercially available under the trade-name ssEDDS® from Palmer Research Laboratories.

**[0068]** Suitable amino carboxylates to be used herein as chelants include ethylene diamine tetra acetates, diethylene triamine pentaacetates, diethylene triamine pentaacetate (DTPA), N-hydroxyethylethylenediamine triacetates, nitrilotriacetates, ethylenediamine tetrapropionates, triethylenetetraaminehexa-acetates, ethanol-diglycines, propylene diamine tetracetic acid (PDTA) and methyl glycine di-acetic acid (MGDA), both in their acid form, or in their alkali metal, ammonium, and substituted ammonium salt forms. Particularly suitable amino carboxylates to be used herein are diethylene triamine penta acetic acid, propylene diamine tetracetic acid (PDTA) which is, for instance, commercially available from BASF under the trade name Trilon FS® and methyl glycine di-acetic acid (MGDA).

**[0069]** Further carboxylate chelants to be used herein include salicylic acid, aspartic acid, glutamic acid, glycine, malonic acid or mixtures thereof.

[0070] Another chelant for use herein is of the formula:



wherein  $R_1$ ,  $R_2$ ,  $R_3$ , and  $R_4$  are independently selected from the group consisting of -H, alkyl, alkoxy, aryl, aryloxy, -Cl, -Br, -NO<sub>2</sub>, -C(O)R', and -SO<sub>2</sub>R"; wherein R' is selected from the group consisting of -H, -OH, alkyl, alkoxy, aryl, and aryloxy; R" is selected from the group consisting of alkyl, alkoxy, aryl, and aryloxy; and  $R_5$ ,  $R_6$ ,  $R_7$ , and  $R_8$  are independently selected from the group consisting of -H and alkyl.

[0071] Typically, the composition herein may comprise up to about 5%, preferably from about 0.1% to about 3% by weight and more preferably from about 0.5% to about 2% by weight of the total composition of a chelant.

#### Silicone polymer

[0072] The liquid composition according to the present invention may further comprise a silicone polymer as an optional but highly preferred ingredient.

[0073] Silicon polymers are preferred optional ingredients herein as they deposit onto the surfaces cleaned with a composition according to the present invention. Thereby, soil adherence, limescale and/or mineral encrustation build-up, is prevented. Indeed, it has been found, that the optional silicone polymers herein, deposit onto the lavatory bowl surface, which is thereby rendered less prone the adherence and/or the build-up of limescale and mineral encrustation, etc. ("mineral deposition").

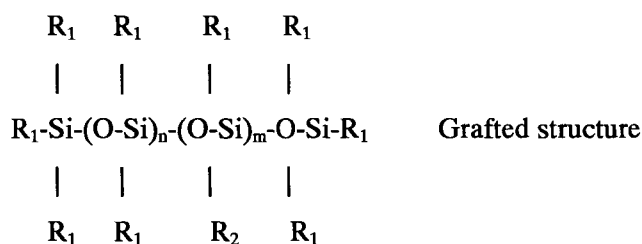
[0074] The composition herein may comprise up to 50%, more preferably of from 0.01% to 30%, even more preferably of from 0.01% to 20%, and most preferably of from 0.01% to 10%, by weight of the total composition of said silicone polymer.

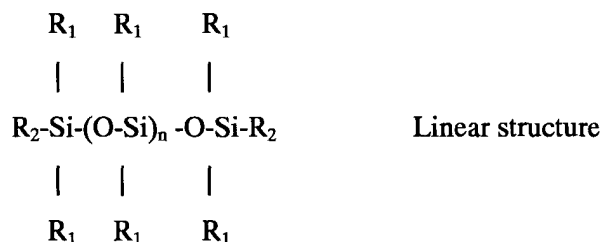
[0075] Suitable silicone polymers are selected from the group consisting of silicone glycol polymers and mixtures thereof.

[0076] In a preferred embodiment according to the present invention, the silicone polymer herein is a silicone glycol polymer.

[0077] Depending on the relative position of the silicone-polyether chains, the silicone glycol polymer can be either linear or grafted.

[0078] Preferably, said silicone glycol polymer is according to the following formulae :





wherein : each  $\text{R}_1$  independently is H or a hydrocarbon radical;  $\text{R}_2$  is a group bearing a polyether functional group;  $n$  is an integer of from 0 to 500; and for the grafted structure  $m$  is an integer of from 1 to 300, and preferably with  $n+m$  more than 1.

**[0079]** In a highly preferred embodiment herein the silicone polymer herein is a grafted silicone glycol.

**[0080]** Preferably, each  $\text{R}_1$  independently is H or a hydrocarbon chain comprising from 1 to 16, more preferably a hydrocarbon chain comprising from 1 to 12 carbon atoms, and even more preferably  $\text{R}_1$  is a  $\text{CH}_3$ -group.  $\text{R}_1$  can also contain  $\text{NH}_2$  groups and/or quaternary ammoniums.

**[0081]** Preferably,  $n$  is an integer of from 0 to 100, more preferably an integer of from 1 to 100, even more preferably  $n$  is an integer of from 1 to 50, and most preferably  $n$  is an integer of from 5 to 30.

**[0082]** Preferably,  $m$  (for the grafted structure) is an integer of from 1 to 80, more preferably  $m$  is an integer of from 1 to 30, and even more preferably  $m$  is an integer of from 2 to 10. Preferably,  $n+m$  is more than 2.

**[0083]** Preferably,  $\text{R}_2$  is an alkoxylated hydrocarbon chain. More preferably,  $\text{R}_2$  is according to the general formulae :



wherein :  $\text{R}_3$  is a hydrocarbon chain; A is an alkoxy group or a mixture thereof;  $p$  is an integer of from 1 to 50; and  $\text{R}_4$  is H or a hydrocarbon chain, or  $-\text{COOH}$ .

**[0084]** Preferably,  $\text{R}_3$  is a hydrocarbon chain comprising from 1 to 12, more preferably 3 to 10, even more preferably from 3 to 6, and most preferably 3 carbon atoms.

**[0085]** Preferably, A is an ethoxy or propoxy or butoxy unit or a mixture thereof, more preferably A is an ethoxy group.

**[0086]** Preferably,  $p$  is an integer of from 1 to 50, more preferably  $p$  is an integer of from 1 to 30, and even more preferably  $p$  is an integer of from 5 to 20.

**[0087]** Preferably,  $\text{R}_4$  is H or a hydrocarbon chain comprising from 1 to 12, more preferably 1 to 6, even more preferably from 3 to 6, and still even preferably 3 carbon atoms, most preferably  $\text{R}_4$  is H.

**[0088]** Preferably, the silicone glycol polymers suitable herein have an average molecular weight of from 500 to 100,000, preferably from 600 to 50,000, more preferably from 1000 to 40,000, and most preferably from 2,000 to 20,000.

**[0089]** Suitable, silicone glycol polymers are commercially available from General electric, Dow Coming, and Witco (see Applicant's co-pending European Patent Applications 03 447 099.7 and 03 447 098.9 for an extensive list of trade names of silicone glycol polymers).

**[0090]** In a highly preferred embodiment according to the present invention, the polymer herein is a Silicones-Polyethers copolymer, commercially available under the trade name SF 1288® from GE Bayer Silicones.

#### Nonionic Surfactants

**[0091]** The liquid composition according to the present invention may comprise, as an optional ingredient but highly preferred ingredient a nonionic surfactant, or mixtures thereof.

**[0092]** Accordingly, the composition herein may comprise up to 70%, preferably of from 1% to 30%, more preferably of from 1% to 20%, and most preferably of from 1% to 10% by weight of the total composition of a nonionic surfactant or mixtures thereof.

**[0093]** The presence of nonionic surfactants in the composition of the present invention allows to provide good cleaning performance. The presence of nonionic surfactants in the composition herein may also allow to provide compositions with further improved shine benefit. Indeed, it has been found that the presence of a nonionic surfactant further contributes to the reduction or even prevention of mineral deposits as described herein above.



**[0094]** Suitable nonionic surfactants to be used herein are alkoxyated fatty alcohol nonionic surfactants that can be readily made by condensation processes that are well known in the art. Indeed, a great variety of such alkoxyated fatty alcohols are commercially available which have very different HLB values. The HLB values of such alkoxyated nonionic surfactants depend essentially on the chain length of the fatty alcohol, the nature of the alkoxylation and the degree of alkoxylation. Hydrophilic nonionic surfactants tend to have a high degree of alkoxylation and a short chain fatty alcohol, while hydrophobic surfactants tend to have a low degree of alkoxylation and a long chain fatty alcohol. Surfactants catalogues are available which list a number of surfactants including nonionics, together with their respective HLB values.

**[0095]** Accordingly, preferred alkoxyated alcohols for use herein are nonionic surfactants according to the formula  $RO(E)_e(P)_pH$  where R is a hydrocarbon chain of from 2 to 24 carbon atoms, E is ethylene oxide and P is propylene oxide, and e and p which represent the average degree of, respectively ethoxylation and propoxylation, are of from 0 to 24. The hydrophobic moiety of the nonionic compound can be a primary or secondary, straight or branched alcohol having from 8 to 24 carbon atoms. Preferred nonionic surfactants for use in the compositions according to the invention are the condensation products of ethylene oxide with alcohols having a straight alkyl chain, having from 6 to 22 carbon atoms, wherein the degree of ethoxylation is from 1 to 15, preferably from 5 to 12. Such suitable nonionic surfactants are commercially available from Shell, for instance, under the trade name Dobanol® or from Shell under the trade name Lutensol®. These nonionics are preferred because they have been found to allow the formulation of a stable product without requiring the addition of stabilisers or hydrotropes. When using other nonionics, it may be necessary to add hydrotropes such as cumene sulphonate or solvents such as butyldiglycolether.

#### Other surfactants

**[0096]** The liquid composition according to the present invention may further comprise a surfactant other than the nonionic surfactant, if any, as described above.

**[0097]** All types of surfactants may be used in the present invention including anionic, cationic, amphoteric or zwitterionic surfactants. It is also possible to use mixtures of such surfactants without departing from the spirit of the present invention.

**[0098]** The presence of surfactants other than the nonionic surfactants in the composition(s) of the present invention allows to provide good cleaning performance.

**[0099]** Accordingly, the liquid composition herein may comprise up to 70%, preferably of from 0.1% to 60%, more preferably of from 1% to 50%, and most preferably of from 5% to 40% by weight of the total composition of a surfactant, or mixtures there.

**[0100]** Suitable amphoteric surfactants to be used in the compositions according to the present invention include amine oxides. Preferred long chain amine oxides for use herein are for instance natural blend C<sub>8</sub>-C<sub>10</sub> amine oxides as well as C<sub>12</sub>-C<sub>16</sub> amine oxides commercially available from Hoechst. Preferred short chain amine oxides for use herein are for instance natural blend C<sub>8</sub>-C<sub>10</sub> amine oxides available from Hoechst.

**[0101]** In a highly preferred embodiment according to the present invention, the liquid composition (or combination of liquid compositions) according to the present invention may further comprise an alkyl alkoxyated sulphate surfactant. Suitable alkyl alkoxyated sulphate surfactants for use herein are according to the formula  $RO(A)_mSO_3M$  wherein : R is a substituted or unsubstituted, linear or branched C<sub>6</sub>-C<sub>24</sub>, preferably a C<sub>8</sub>-C<sub>20</sub>, more preferably a C<sub>12</sub>-C<sub>20</sub>, even more preferably a C<sub>12</sub>-C<sub>18</sub>, and most preferably a C<sub>12</sub>-C<sub>14</sub> alkyl group; A is an ethoxy or propoxy or butoxy unit; m is greater than zero, preferably at least 0.1, more preferably between 0.1 and 15, even more preferably between 0.5 and 6, and most preferably between 0.5 and 4; and M is H or a cation which can be, for example, a metal cation (e.g., sodium, potassium, lithium, calcium, magnesium, etc.), ammonium or substituted-ammonium cation. Alkyl ethoxyated sulfates as well as alkyl propoxyated sulfates and alkyl butoxyated sulfates are contemplated herein. Highly preferred herein as alkyl alkoxyated sulphate surfactants are alkyl ethoxyated sulfates, i.e., A is an ethoxy group. Specific examples of substituted ammonium cations include methyl-, dimethyl-, trimethyl-ammonium and quaternary ammonium cations, such as tetramethyl-ammonium, dimethyl piperdinium and cations derived from alkanolamines such as ethylamine, diethylamine, triethylamine isopropanolamine, mixtures thereof, and the like. Exemplary surfactants are C<sub>12</sub>-C<sub>18</sub> alkyl polyethoxylate (1.0) sulfate (C<sub>12</sub>-C<sub>18</sub>E(1.0)SM), C<sub>12</sub>-C<sub>18</sub> alkyl polyethoxylate (2.25) sulfate (C<sub>12</sub>-C<sub>18</sub>E(2.25)SM), C<sub>12</sub>-C<sub>18</sub> alkyl polyethoxylate (3.0) sulfate (C<sub>12</sub>-C<sub>18</sub>E(3.0)SM), C<sub>12</sub>-C<sub>14</sub> alkyl polyethoxylate (3.0) sulfate (C<sub>12</sub>-C<sub>14</sub>E(3.0)SM) and C<sub>12</sub>-C<sub>18</sub> alkyl polyethoxylate (4.0) sulfate (C<sub>12</sub>-C<sub>18</sub>E(4.0)SM), wherein M is conveniently selected from sodium and potassium. Of particular importance herein is an alkyl ethoxyated sulfate with a degree of ethoxylation of 2.4 or between 2-3. Sodium C<sub>12</sub>/C<sub>14</sub> E3 sulphate may be for example commercially available from Albright & Wilson under the name EMPICOL ESC3®.

**[0102]** When present, alkyl alkoxyated sulphate surfactants contribute to suds stability, and volume and also contribute to product viscosity.

Solvent

[0103] The liquid composition according to the present invention may further comprise a solvent.

[0104] Accordingly, the composition herein may comprise up to 30%, preferably of from 0.1% to 30%, more preferably of from 1% to 20%, and most preferably of from 1% to 15% by weight of the total composition of a solvent, or mixtures there.

[0105] Suitable solvents for use herein include ethers and diethers having from 4 to 14 carbon atoms, preferably from 6 to 12 carbon atoms, and more preferably from 8 to 10 carbon atoms, glycols or alkoxyated glycols, glycol ethers and/or derivatives, polyols, alkoxyated aromatic alcohols, aromatic alcohols, aliphatic branched or linear alcohols, alkoxyated aliphatic branched or linear alcohols, terpenes, and mixtures thereof.

[0106] Suitable glycols for use herein are according to the formula  $\text{HO-CR}_1\text{R}_2\text{-OH}$  wherein  $\text{R}_1$  and  $\text{R}_2$  are independently H or a  $\text{C}_2\text{-C}_{12}$  saturated or unsaturated aliphatic hydrocarbon chain and/or cyclic. Suitable glycols to be used herein are dodecaneglycol, 1,2-hexanediol and/or propanediol.

[0107] Suitable alkoxyated glycols for use herein are according to the formula  $\text{R-(A)}_n\text{R}_1\text{-OH}$

wherein R is H, OH, a linear saturated or unsaturated alkyl of from 1 to 20 carbon atoms, preferably from 2 to 15 and more preferably from 2 to 10, wherein  $\text{R}_1$  is H or a linear saturated or unsaturated alkyl of from 1 to 20 carbon atoms, preferably from 2 to 15 and more preferably from 2 to 10, and A is an alkoxy group preferably ethoxy, methoxy, and/or propoxy and n is from 1 to 5, preferably 1 to 2. Suitable alkoxyated glycols to be used herein are methoxy octadecanol and/or ethoxyethoxyethanol.

[0108] Suitable glycol ethers and/or derivatives thereof for use herein include monoglycol ethers and/or derivatives thereof, di-, tri- and poly-glycol ethers and/or derivatives thereof and mixtures thereof.

[0109] Suitable monoglycol ethers and derivatives thereof for use herein include propylene glycol butyl ether, and water-soluble CELLOSOLVE® solvents or mixtures thereof. Preferred Cellosolve® solvents include 2-(Hexyloxy)ethanol (i.e., 2-hexyl Cellosolve®), ethylene glycol ethyl ether (i.e., 2-ethyl Cellosolve®), ethylene glycol butyl ether (i.e., 2-butyl Cellosolve®) or mixtures thereof.

[0110] Suitable polyglycol ethers and derivatives thereof for use herein include n-butoxypropoxypropanol (n-BPP), butyl triglycol ether (BTGE), butyl diglycol ether (BDGE), diethylene glycol butyl ether, water-soluble CARBITOL® solvents or mixtures thereof.

[0111] Preferred water-soluble CARBITOL® solvents are compounds of the 2-(2-alkoxy ethoxy)ethanol class, 2-(2-alkoxy ethoxy)propanol class and/or 2-(2-alkoxy ethoxy)butanol class wherein the alkoxy group is derived from ethyl, propyl, butyl and tert-butyl. A preferred water-soluble carbitol is 2-(2-butoxyethoxy)ethanol also known as butyl carbitol®.

[0112] Suitable polyols for use herein are aliphatic linear or branched saturated or unsaturated hydrocarbons having from 2 to 12 carbon atoms, preferably 4 to 10, and comprising at least 2 hydroxyl groups, preferably from 2 to 4. Suitable polyols herein are diols such as 2-ethyl-1,3-hexanediol, 2,2,4-trimethyl-1,3-pentanediol, methyl-2,4 pentanediol, 1,6-hexanediol or mixture thereof.

[0113] Suitable alkoxyated aromatic alcohols for use herein are according to the formula  $\text{R-(A)}_n\text{-OH}$  wherein R is an alkyl substituted or non-alkyl substituted aryl group of from 1 to 20 carbon atoms, preferably from 2 to 15 and more preferably from 2 to 10, wherein A is an alkoxy group preferably butoxy, propoxy and/or ethoxy, and n is an integer of from 1 to 5, preferably 1 to 2. Suitable alkoxyated aromatic alcohols are benzoxyethanol and/or benzoxypropanol.

[0114] Suitable aromatic alcohols for use herein are according to the formula  $\text{R-OH}$  wherein R is an alkyl substituted or non-alkyl substituted aryl group of from 1 to 20 carbon atoms, preferably from 1 to 15 and more preferably from 1 to 10. For example a suitable aromatic alcohol to be used herein is benzyl alcohol.

[0115] Suitable aliphatic linear or branched alcohols for use herein are according to the formula  $\text{R-OH}$  wherein R is a branched or linear saturated or unsaturated alkyl group of from 1 to 20 carbon atoms, preferably from 2 to 15 and more preferably from 2 to 12. Particularly suitable aliphatic branched alcohols to be used herein include 2-ethylbutanol and/or 2-methylbutanol. Particularly suitable aliphatic linear alcohols to be used herein include decanol, ethanol and/or 1- or 2-propanol.

[0116] Suitable alkoxyated aliphatic linear or branched alcohols for use herein are according to the formula  $\text{R-(A)}_n\text{-OH}$  wherein R is a branched or linear saturated or unsaturated alkyl group of from 1 to 20 carbon atoms, preferably from 2 to 15 and more preferably from 5 to 12, wherein A is an alkoxy group preferably butoxy, propoxy and/or ethoxy, and n is an integer of from 1 to 5, preferably 1 to 2. Suitable alkoxyated aliphatic branched alcohols include 1-methylpropoxyethanol and/or 2-methylbutoxyethanol. Suitable alkoxyated aliphatic linear alcohols include ethoxy propanol and/or propoxy propanol.

[0117] Other suitable solvents include ter amilic alcohol, terpene solvents and the like.

[0118] Suitable terpenes for use herein are mono-and bicyclic terpenes, especially those of the hydrocarbon class, which include the terpinenes, terpinolenes and pinenes and mixtures thereof. Highly preferred materials of this type are dipentene, alpha-pinene and/or beta-pinene. For example, pinene is commercially available from SCM Glidco

(Jacksonville) under the name Alpha Pinene P&F®.

**[0119]** Particularly preferred solvents for use herein are ethylene glycol butyl ether, propylene glycol butyl ether, diethylene glycol butyl ether, butoxy propoxy propanol, butyl diglycol ether, benzyl alcohol, butoxypropanol, 2-(2-butoxyethoxy) ethanol, ethanol, methanol, benzyl alcohol, isopropanol, 1-propanol and mixtures thereof.

#### Thickening system

**[0120]** The composition herein may comprise a thickener or a thickening system as a highly preferred optional ingredient, in addition to the Gellan gum

**[0121]** Suitable thickeners herein are selected from the group consisting of organic thickeners, and inorganic thickeners and mixtures thereof.

**[0122]** Preferably the thickener herein when present, is an organic thickeners, more preferably a polyacrylate; a gum, which can be derived from marine sources (agar, alginates, carrageenan, furcellaran), terrestrial plants (guar gum, gum Arabic, gum tragacanth, karaya gum, locust bean gum and pectin), animal sources (gelatin), microbial polysaccharides other than Gellan gum (such as dextran, rhamnsam gum, welan gum, Xanthan gum); a polysaccharide derivative (carboxymethylcellulose, methylhydroxypropyl cellulose, hydroxy propyl cellulose, hydroxyethyl cellulose, propylene glycol alginate, hydroxy propyl guar and modified starters); or a mixture thereof.

**[0123]** Other Suitable thickening systems are selected from the group consisting of a cationic/anionic surfactant system self-thickening systems.

**[0124]** Preferably, the compositions herein comprise a polyacrylate or a gum or a combination thereof.

**[0125]** The composition herein may comprise from 0.005% to 15%, preferably from 0.01% to 10%, more preferably from 0.02% to 5% by weight of the total composition of a thickener or a thickening system.

#### Perfumes

**[0126]** The composition herein may comprise, as an optional ingredient, a perfume ingredient. The composition herein may comprise from 0.01% to 40%, preferably from 0.01% to 35%, more preferably from 0.1% to 30%, and most preferably from 0.1% to 25% by weight of the total composition of said perfume ingredient.

**[0127]** Depending on the end use envisioned, the compositions according to the present invention may further comprise a variety of other ingredients including dyes, optical brighteners, builders, pigments, solvents, buffering agents, radical scavengers, polymers, stabilizers and the like.

#### Examples

**[0128]** The following examples will further illustrate the present invention. The compositions are made by combining the listed ingredients in the listed proportions (weight % unless otherwise specified). Furthermore, the compositions comprise water and minors up to 100%. The following Examples are meant to exemplify compositions according to the present invention but are not necessarily used to limit or otherwise define the scope of the present invention.

**[0129]** The compositions are present in the container of a lavatory bowl rim-block comprising : at least one container; at least one liquid composition; and a dispensing means connected to at least one of said container(s) for dispensing a single liquid composition or a combination of liquid compositions onto a lavatory bowl surface.

I)

Ingredients	Weight %
Kelcogel F®	0.05
Dobanol 91.8®	15
HLAS	1
Na HEDP	0.5
SF 1288®	5.0
Perfume	12

pH of 6 adjusted with NaOH / H<sub>2</sub>SO<sub>4</sub>

II)

Ingredients	Weight %
Kelcogel F®	0.02%
Perfume	7%
Marlinat 242/90®	12
Dobanol 91.8®	2%
Kelzan T®	0.3%

pH of 6 adjusted with NaOH / H<sub>2</sub>SO<sub>4</sub>

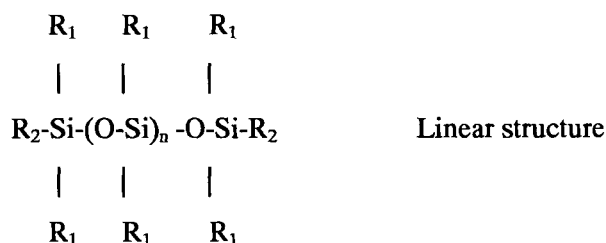
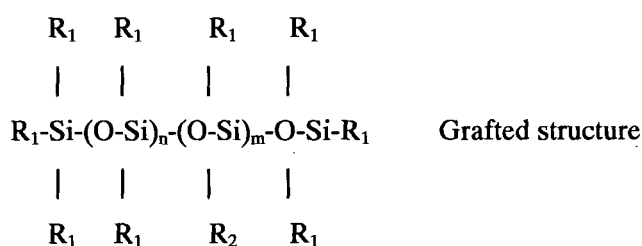
Kelzan T® is Xanthan Gum and Kelcogel F® is gellan gum, both commercially available from CP-Kelco.  
 Dobanol® 23-3 is a C<sub>12</sub>-C<sub>13</sub> EO3 nonionic surfactant, and Dobanol® 91-8 is a C<sub>9</sub>-C<sub>11</sub> EO8 nonionic surfactant, all commercially available from SHELL.  
 Na HEDP is Sodium ethane 1-hydroxy diphosphonate.  
 SF 1288® is a Silicones-Polyether copolymer, commercially available from GE Bayer Silicones.  
**[0130]** HLAS is a linear alkylbenzene sulphonic acid anionic surfactant.  
 Marlinat 242/90® is an alkyl ethoxylated sulfate commercially available from Sasol.

## Claims

1. A lavatory bowl rim-block comprising : at least one liquid composition; and a dispenser, said dispenser comprising at least one container and a dispensing means connected to said container(s) for dispensing said liquid composition onto a lavatory bowl surface; wherein said liquid composition comprises gellan gum.
2. A lavatory bowl rim-block according to claim 1, wherein said dispenser additionally comprises an attachment means, preferably said dispenser additionally comprises an attachment means and a supporting structure.
3. A lavatory bowl rim-block according to claim 2, wherein said attachment means attaches said dispenser to the rim of a lavatory bowl or suspends said dispenser from said rim, preferably said attachment means is a hook to suspend said dispenser from the rim of a lavatory bowl.
4. A lavatory bowl rim-block according to any of the preceding claims, wherein said liquid composition comprises

from 0.001% to 1%, preferably from 0.005% to 0.5%, more preferably from 0.001% to 0.2% by weight of the total composition of gellan gum.

5. A lavatory bowl rim-block according to any of the preceding claims, wherein said liquid composition is a thickened composition, preferably a fluid gel.
6. A lavatory bowl rim-block according to any of the preceding claims, wherein said liquid composition additionally comprises a chelant.
7. A lavatory bowl rim-block according to claim 6, wherein said chelant is selected from the group comprising phosphonate chelants, amino carboxylate chelants, other carboxylate chelants, polyfunctionally-substituted aromatic chelants, ethylenediamine N,N'-disuccinic acids, or mixtures thereof; preferably a phosphonate chelant or a mixture thereof, more preferably selected from the group consisting of ethane 1-hydroxy diphosphonates (HEDP) or salts thereof, alkylene poly (alkylene phosphonate), amino phosphonate compounds, including amino aminotri (methylene phosphonic acid) (ATMP), nitrilo trimethylene phosphonates (NTP), ethylene diamine tetra methylene phosphonates, and diethylene triamine penta methylene phosphonates (DTPMP) and mixtures thereof.
8. A lavatory bowl rim-block according to any of claims 6 or 7, wherein said chelant is ethane 1-hydroxy diphosphonate (HEDP) or a salt thereof.
9. A lavatory bowl rim-block according to any of claims 6 to 8, wherein said liquid composition comprises up to 5% by weight of the total composition of a chelant.
10. A lavatory bowl rim-block according to any of the preceding claims, wherein said liquid composition additionally comprises a silicone polymer.
11. A lavatory bowl rim-block according to claim 10, wherein said silicone polymer is a silicone glycol polymer.
12. A lavatory bowl rim-block according to any of claims 10 or 11, wherein said silicone polymer is a linear or grafted silicone glycol polymer according to the following formulae :



wherein : each  $R_1$  independently is a hydrocarbon radical;  $R_2$  is a group bearing a polyether functional group;  $n$  is an integer of from 0 to 500; and for the grafted structure  $m$  is an integer of from 1 to 300, and preferably with  $n+m$  more than 1.

13. A lavatory bowl rim-block according to any of claims 10 to 12, wherein said liquid composition comprises up to

50% by weight of the total composition of said silicone glycol polymer.

14. A lavatory bowl rim-block according to any of the preceding claims, wherein said liquid composition additionally comprises a nonionic surfactant or mixtures thereof.

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15. A lavatory bowl rim-block according to claim 14, wherein said liquid composition comprises up to 50% by weight of the total composition of a nonionic surfactant or mixtures thereof.

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16. A process of cleaning a lavatory bowl surface with a lavatory bowl rim-block, wherein said process comprises the step of applying a liquid composition according to any of the preceding claims onto a lavatory bowl surface.

17. A process of cleaning a lavatory bowl surface according to claim 16, wherein said application of said liquid composition onto a lavatory bowl surface is done upon flushing said lavatory bowl surface with water.

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European Patent  
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# EUROPEAN SEARCH REPORT

Application Number  
EP 04 44 7081

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	GB 2 288 186 A (KELCO INT LTD) 11 October 1995 (1995-10-11) * page 1, line 26 - line 32 * * page 2, line 23 - page 3, line 14 * * page 6, line 19 - line 23 * * claims 1,3,7,9,10; examples 1,3 * -----	1-7,9, 14-17	C11D17/00 C11D17/04 E03D9/00 E03D9/02 E03D9/03 C11D3/22
A	EP 1 245 666 A (THE PROCTER & GAMBLE COMPANY (US)) 2 October 2002 (2002-10-02) * page 2, line 5 - line 7 * * page 5, line 35 - line 40 * * page 6, line 30 - page 8, line 36 * * page 12, line 8 - line 22 * * claims 1,7-12; examples I,II,IV,VI,VII,VIII * -----	1-17	
A	EP 1 245 667 A (THE PROCTER & GAMBLE COMPANY (US)) 2 October 2002 (2002-10-02) * page 2, line 5 - line 7 * * page 3, line 22 - line 27 * * page 5, line 17 - page 7, line 15 * * page 10, line 51 - page 11, line 7 * * examples I,III,V * -----	1-17	TECHNICAL FIELDS SEARCHED (Int.Cl.7)
A,D	EP 0 775 741 A (SARA LEE/DE N.V. (NL)) 28 May 1997 (1997-05-28) * column 1, line 3 - line 9 * * column 1, line 53 - line 57 * * column 3, line 32 - line 59 * * column 4, line 48 - line 50 * * claims 1,2,4,12,13; examples 1,2 * -----	1-17	C11D E03D
A	GB 2 338 496 A (S.C. JOHNSON & SON INC (US)) 22 December 1999 (1999-12-22) * the whole document * -----	1-3	
A	US 2002/148036 A1 (BALLS STEVE NICOL ET AL) 17 October 2002 (2002-10-17) * the whole document * -----	1-3	
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 3 August 2004	Examiner Diebold, A
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons &amp; : member of the same patent family, corresponding document</p>			

EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 04 44 7081

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
The members are as contained in the European Patent Office EDP file on  
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03-08-2004

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
GB 2288186	A	11-10-1995	NONE	
EP 1245666	A	02-10-2002	EP 1245666 A1	02-10-2002
			CA 2440410 A1	03-10-2002
			EG 23128 A	28-04-2004
			WO 02077142 A1	03-10-2002
			US 2002193278 A1	19-12-2002
EP 1245667	A	02-10-2002	EP 1245667 A1	02-10-2002
			CA 2440516 A1	03-10-2002
			EG 23089 A	31-03-2004
			WO 02077146 A1	03-10-2002
			US 2002193270 A1	19-12-2002
EP 0775741	A	28-05-1997	EP 0775741 A1	28-05-1997
			DE 775741 T1	20-05-1999
			ES 2124204 T1	01-02-1999
GB 2338496	A	22-12-1999	GB 2338495 A	22-12-1999
			AU 760724 B2	22-05-2003
			AU 4379299 A	05-01-2000
			AU 8745698 A	05-01-2000
			AU 753432 B2	17-10-2002
			AU 9700598 A	23-12-1999
			BR 9911290 A	06-03-2001
			CA 2334793 A1	23-12-1999
			CN 1310776 T	29-08-2001
			EP 1336693 A2	20-08-2003
			EP 1435415 A1	07-07-2004
			EP 1433905 A1	30-06-2004
			EP 1088139 A1	04-04-2001
			GB 2345494 A	12-07-2000
			GB 2361250 A ,B	17-10-2001
			GB 2370288 A ,B	26-06-2002
			GB 2371815 A	07-08-2002
			GB 2370289 A ,B	26-06-2002
			GB 2370290 A ,B	26-06-2002
			WO 9966139 A1	23-12-1999
			WO 9966140 A1	23-12-1999
			JP 2002518611 T	25-06-2002
			NZ 508836 A	29-08-2003
			PL 344992 A1	19-11-2001
			US 6505356 B1	14-01-2003
			ZA 200007402 A	12-12-2001
US 2002148036	A1	17-10-2002	GB 2372046 A	14-08-2002

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82



**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 04 44 7081

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on  
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

03-08-2004

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2002148036 A1		BR 0207496 A	09-03-2004
		CA 2440340 A1	22-08-2002
		EP 1366244 A1	03-12-2003
		WO 02064898 A1	22-08-2002
-----			

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82