

(19)



(11)

EP 2 804 941 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention of the grant of the patent:
30.03.2016 Bulletin 2016/13

(51) Int Cl.:
C11D 17/00 (2006.01) C11D 1/04 (2006.01)
C11D 3/30 (2006.01) C11D 10/04 (2006.01)
C11D 9/30 (2006.01) C11D 1/40 (2006.01)

(21) Application number: **12809727.6**

(86) International application number:
PCT/EP2012/075607

(22) Date of filing: **14.12.2012**

(87) International publication number:
WO 2013/107576 (25.07.2013 Gazette 2013/30)

(54) HARD SURFACE CLEANING COMPOSITION WITH FOAM BOOSTER

SCHAUMVERSTÄRKER ENTHALTENDE REINIGUNGSZUSAMMENSETZUNG FÜR HARTE OBERFLÄCHEN

COMPOSITION DE NETTOYAGE DE SURFACES DURES AVEC PROMOTEUR DE MOUSSE

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

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(30) Priority: **20.01.2012 EP 12151851**

(43) Date of publication of application:
26.11.2014 Bulletin 2014/48

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AL AT BE BG CH CZ DE DK EE ES FI FR GR HR HU IS IT LI LT LU LV MC MK NL NO PL PT RO RS SE SI SK SM TR

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Designated Contracting States:
CY GB IE MT

Remarks:

The file contains technical information submitted after the application was filed and not included in this specification

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Description

Field of the invention

5 [0001] The present invention relates to hard surface cleaning compositions, and their use. In particular, the invention relates to hard surface cleaning compositions in the form of a toilet block.

Background of the invention

10 [0002] Hard surface cleaning blocks, such as lavatory blocks are known in the art and are typically configured to provide an automatic and sustained release of active ingredients to a liquid passing the block and/or the release of perfume to the air. For example, they may be suspended in a container under the rim of a lavatory bowl or urinal such that, during a flushing cycle, water from the cistern flows over the block thereby dissolving a portion of the block and releasing active ingredients of the block into the lavatory bowl. They may also be used inside a dish washing machine or even for the purpose of manual dishwashing.

15 [0003] Different means of applying blocks to a toilet have been disclosed in the art. Holders for solid detergent blocks are for instance disclosed in EP-B1-586 137. An alternative to the lavatory block is a liquid dispenser device, such as the device disclosed in GB2389123.

20 [0004] Furthermore, hard surface cleaning blocks in different forms are disclosed in the art. Solid blocks in a holder are for instance disclosed in EP-B1-553 162. The hard surface cleaning composition can even be applied directly onto the surface as disclosed in EP-A1-1,086,199, where a self adhesive paste is disclosed. Alternatively, WO-2008/058853 discloses a detergent composition comprising an adhesive phase.

In these and other hard surface cleaning blocks, the delivery of perfume to a room is the main objective.

25 On the other hand, many known hard surface cleaning blocks have the effective cleaning of the lavatory appliance, in particular the toilet bowl, as their main characteristic.

[0005] WO 2008/125407 A1 discloses a toilet cleaning block which is at least partially transparent or translucent and comprises soap, humectant, solvent and biocide material.

[0006] In this connection, it is desirable that not only effective cleaning is obtained but also a significant amount of foam is produced when the toilet is flushed and water flows around the toilet block.

30 Rea-son is that formation of foam supports the cleaning performance of the toilet block. Furthermore, said foam formation is aesthetically pleasing for the user and gives the impression of effective cleaning.

[0007] However, it has been found that the foaming behavior of toilet blocks of the prior art often leaves to be desired. In particular, toilet blocks containing fatty acid soap often hardly show any foaming behavior.

35 [0008] In this connection, an object of the present invention is to provide a hard surface cleaning composition in the form of a toilet block that comprises fatty acid soap and has, in use, favorable foaming behavior.

It is a further object that said hard surface cleaning composition rinses away in a number of flushes, and releases a hygiene agent at a rate sufficient to provide adequate hygiene throughout the operating life of the toilet block.

It is another object that said toilet block can be produced in a simple way and is aesthetically pleasing.

40 [0009] We have surprisingly found that at least one of these objects is achieved when using a hard surface cleaning composition in the form of a toilet block, comprising fatty acid soap, a co-surfactant and a long chain alkyl triamine according to the present invention.

Definition of the invention

45 [0010] Accordingly, in one aspect the present invention provides a hard surface cleaning composition in the form of a toilet block, according to claim 1.

Detailed description of the invention

50 [0011] At least one triamine compound which is covered by the definition of the foam boosting and stabilizing ingredient of the present invention is known and registered as a biocide. However, it has been found in the context of the present invention that such compound can be favorably used as a foam boosting and stabilizing ingredient in a cleaning composition of the invention which is in the form of a toilet block.

55 It was also found that the foam boosting action by the foam boosting and stabilizing ingredient of the invention generally more than compensates the de-foaming action by the fatty acid soap which is also present in the composition of the invention. As a result, when said cleaning composition is used for cleaning a toilet, a significant amount of foam is produced at every flush of the toilet.

[0012] The foam booster and stabilizing ingredient of the invention is selected from the group consisting of C₈-C₂₀

alkyl triamines, C₈-C₂₀ alkyl dipropylene triamines, C₈-C₂₀ alkyl diethylene triamine and mixtures thereof.

[0013] Most preferred types of said foam booster and stabilizing ingredient are selected from C₁₀ alkyl dipropylene triamine, C₁₂ alkyl dipropylene triamine and mixtures thereof. It was found that these types of long chain triamine provide the best results in terms of stable foam.

[0014] Said foam booster and stabilizing ingredient is present at a concentration of from 1 to 30 % by weight, and is preferably present in the cleaning composition of the invention at a concentration of from 1 to 20%, more preferably from 2 to 8%, by weight.

The fatty acid soap

[0015] The fatty acid soap is present in the cleaning composition of the invention as a surfactant. It is also present for providing the desired transparency of the cleaning composition of the invention.

[0016] The fatty acid soap is preferably selected from long chain fatty acid soaps having a C₁₀-C₂₀ alkyl group.

[0017] The most preferred type of said fatty acid soap for use in the composition of the invention is selected from sodium laurate, sodium stearate, sodium oleate, sodium palmate and mixtures thereof.

[0018] Preferably, the level of the fatty acid soap in the cleaning composition of the invention is in the range of from 10 to 70%, more preferably from 20 to 70%, by weight.

The co-surfactant

[0019] The co-surfactant is preferably present in the composition of the invention at a concentration of from 5 to 50% by weight. Said co-surfactant may generally be chosen from anionic, nonionic, cationic, amphoteric/zwitterionic surfactants and mixtures thereof.

[0020] Preferably, the co-surfactant is selected from the group consisting of anionic surfactants, nonionic surfactants, amphoteric surfactants and mixtures thereof. In this connection, the term "anionic surfactants" is meant to be an indication of synthetic anionic surfactants other than soap.

[0021] Suitable synthetic (non-soap) anionic surfactants are water-soluble salts of organic sulphuric acid mono-esters and sulphonic acids which have in the molecular structure a branched or straight chain alkyl group containing from 6 to 22 carbon atoms in the alkyl part.

[0022] Examples of such anionic surfactants are water soluble salts of:

- (primary) long chain (e.g. 6-22 C-atoms) alcohol sulphates (hereinafter referred to as PAS), especially those obtained by sulphating the fatty alcohols produced by reducing the glycerides of tallow or coconut oil;
- alkyl benzene sulphonates, such as those in which the alkyl group contains from 6 to 20 carbon atoms;
- secondary alkanesulphonates;

and mixtures thereof.

[0023] Also suitable are the salts of:

- alkylglyceryl ether sulphates, especially of the ethers of fatty alcohols derived from tallow and coconut oil;
- fatty acid monoglyceride sulphates;
- sulphates of ethoxylated aliphatic alcohols containing 1-12 ethyleneoxy groups;
- alkylphenol ethyleneoxy-ether sulphates with from 1 to 8 ethyleneoxy units per molecule and in which the alkyl groups contain from 4 to 14 carbon atoms;
- the reaction product of fatty acids esterified with isethionic acid and neutralised with alkali,

and mixtures thereof.

[0024] The preferred water-soluble synthetic anionic surfactants are the alkali metal (such as sodium and potassium) salts of alkyl-benzenesulphonates, olefin sulphonates, alkyl sulphates, and the fatty acid mono-glyceride sulphates. Because of their favorable foaming behavior in the presence of the long chain triamine used in the present invention, olefin sulfonates represent the most preferred type of anionic surfactants.

[0025] When present in the cleaning composition of the invention, the concentration of the anionic surfactant is preferably from 5 to 15% by weight.

[0026] A suitable class of nonionic surfactants can be broadly described as compounds produced by the condensation of simple alkylene oxides, which are hydrophilic in nature, with an aliphatic or alkyl-aromatic hydrophobic compound having a reactive hydrogen atom. The length of the hydrophilic or polyoxyalkylene chain which is attached to any particular hydrophobic group can be readily adjusted to yield a compound having the desired balance between hydrophilic and hydrophobic elements. This enables the choice of nonionic surfactants with the right HLB. Particular examples include:

- the condensation products of aliphatic alcohols having from 8 to 22 carbon atoms in either straight or branched chain configuration with ethylene oxide, such as a coconut alcohol/ethylene oxide condensates having from 2 to 15 moles of ethylene oxide per mole of coconut alcohol;
- condensates of alkylphenols having C6-C15 alkyl groups with 5 to 25 moles of ethylene oxide per mole of alkylphenol;
- condensates of the reaction product of ethylene-diamine and propylene oxide with ethylene oxide, the condensates containing from 40 to 80% of ethyleneoxy groups by weight and having a molecular weight of from 5,000 to 11,000.

[0027] In view of their favourable foaming behavior, ethoxylated alcohols having 5-8 moles of ethylene oxide per mole of alcohol and an a C9-C11 alkyl chain are the most preferred type of nonionic surfactants.

[0028] Alternatively or additionally, the following class of amphoteric surfactant can be used:

- tertiary amine oxides of structure $R^1R^2R^3N-O$, where R^1 is an alkyl group of 8 to 20 carbon atoms and R^2 and R^3 are each alkyl or hydroxyalkyl groups of 1 to 3 carbon atoms, e.g. C12-C18-alkyldimethyl amineoxides.

[0029] When present in the cleaning composition of the invention, the concentration of the nonionic surfactant is preferably from 5 to 15% by weight.

Biocide material

[0030] The cleaning composition of the invention may optionally contain biocide material other than the foam booster and stabilizing ingredient of the invention.

[0031] Said biocide material is preferably selected from CTAC (cetyl trimethyl ammonium chloride), and BAC (benzalkonium chloride) and didecyldimethylammonium chloride, dodecyldipropylene triamine and poly (hexamethylenbiguanide) hydrochloride. BAC is the most preferred type of biocide.

[0032] These quaternary ammonium biocides with different chain lengths have been found to give different hygiene properties. Surprisingly it has been observed that the hygienic properties of a quaternary ammonium biocide having at least one alkyl chain with a length of at least 14 carbon atoms (C14) show a better biocidal effect than the quaternary ammonium biocides having a shorter chain. The preferred chain length is C14-C16, more preferably a mixture of C14-C16, with 80-98%w of C14. When present, the concentration of the biocide in the composition of the invention is preferably 1 to 30%, more preferably 5 to 25%, by weight.

Optional ingredients

[0033] The hard surface cleaning composition according to the invention may further comprise builders, dyes, perfume, hygiene agents, antioxidants, radical scavengers, chelating agents, hydrotropes, anticorrosion agents, opacifiers, brighteners, preservatives and/or abrasives such as silica, kaolin, talc etc.

Perfume is preferably present in the cleaning composition of the invention, in a preferred concentration of 2 to 15% by weight.

[0034] The composition may preferably comprise humectant. Humectants maintain both structure and clarity. When present, said humectants will enable retention of water within the toilet block formulation of the invention. Preferred humectants are polyhydroxylated organic compounds, such as sorbitol and sucrose. In this connection, it is noted that the solvents glycerol and polyethylene glycol (PEG) are also suitable as humectants.

[0035] The humectant may be present in a concentration of 0 to 50% by weight of the composition. The humectant is preferably present in a concentration of at least 5%, but preferably not more than 40%, more preferably not more than 30%.

[0036] Solvents may also be present in the composition. Preferred solvents include poly alkylene glycols (e.g. PEG, PPG) and short chain organic solvents (e.g. ethanol or isopropanol). The solvent may be present in the composition in a concentration of 0 to 20%, preferably 1-15% by weight of the composition.

Composition size and shape

[0037] The shape of the hard surface cleaning composition of the invention is preferably hydrodynamic, as this will help in better control of the erosion properties of the block.

Such hydrodynamic shape will also assist in the foaming behaviour of the block. Thus, round, smooth shapes are preferred over square/rectangular blocks with sharp edges, due to superior hydrodynamic behaviour.

[0038] The composition life is directly related to its formulation and the size. A normal size toilet block is between about 4 and 50 grams, preferably about 4 to 35 g.

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[0039] It is preferred to provide a toilet block that is at least partially transparent or translucent. By at least partially transparent or translucent is meant that a 1 cm thick sample of the material transmits at least 5% of visible light, preferably at least 20% of visible light, more preferably at least 50% of visible light. More preferably the block is transparent. By transparent is meant that a 1 cm thick sample of the block transmits at least 70% of visible light, preferably at least 90%. Due to the presence of a dye, and almost inevitable absorption and/or scattering of some of the light, the transmission is generally below 95% of visible light.

[0040] The cleaning composition is preferably in the form of a cast toilet block.

[0041] Furthermore, in a preferred aspect the toilet block of the invention is present in a cage-less lavatory cleansing device, comprising -in addition to said toilet block- a support member having a hook and adapted to be suspended from the rim of a toilet bowl, whereby the block enrobes or encases part of the hook, preferably the lower part thereof.

[0042] The present invention is illustrated by way of the following non-limiting examples.

Example 1

[0043] Toilet blocks having various formulations according to the present invention were prepared.

[0044] In Table 1, these formulations are shown

It can be noticed that the foam booster and stabilizing ingredient according to the present invention in these formulations is a mixture of N,N-Bis(3-aminopropyl) dodecylamine.

Table 1

Solid composition	1	2	3
	%wt	%wt	%wt
Premix 1*	71.9	67.9	72.9
Alpha olefine sulfonate	7.6	7.6	7.6
N,N-Bis(3-aminopropyl) dodecylamine	5.0	5.0	10.0
Amines, C12-18-alkyldimethyl, N-oxides	4.0	4.0	4.0
Fragrance	3.5	3.5	3.5
C9-C11, 8 EO Nonionic Surfactant	8.0	12.0	2.0
Dye	0.01	0.01	0.01
Premix 1* composition	Raw Material	Range	
		%wt	
Soap Base 1	Sorbitol	10-25	
	Aqua	10-25	
	Propylene Glycol	10-25	
	Fatty Acid Soaps	10-35	
	Glycerin	5-10	
	Sodium Chloride	1-5	
	Tetrasodium Etidronate	0,1-1	
	Tetrasodium EDTA	0,1-1	
Co-surfactants	Anionic Surfactants	10-25	

[0045] Toilet blocks having these formulations showed good performance and favorable foaming behavior when used for cleaning a toilet bowl.

Example 2

[0046] In this example the foaming behaviour of 3 different toilet blocks was investigated. The formulations of toilet blocks A and B are outside of the scope of the present invention whereas the formulation of toilet block C is according

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to the present invention.

[0047] In Table 2, these toilet block formulations are shown.

Table 2

Composition of block	A	B	C
	%wt	%wt	%wt
Soap base 2*	100	76.9	71.9
Bioterge AS90	0	7.6	7.6
Perfume	0	3.5	3.5
Neodol 91-8	0	8.0	8.0
Empigen OD	0	4.0	4.0
Minors (dyes)	0	0.01	0.01
Triameen Y12D	0	0	5.0

[0048] Wherein:

Bioterge AS90 : Alpha olefin sulfonate (C₁₉-C₁₆), ex Stepan Company.

Neodol 91-8 : ethoxylated alcohol (C9-11), ex Shell.

Empigen OD : C₁₂-C₁₈ alkyl dimethylamine oxide, ex Akzo Nobel.

Triameen : C₁₂ alkyl dipropylenetriamine, ex Huntsman.

[0049] The composition of the soap base 2* is shown in Table 3.

Table 3

**Soap Base 2 composition	Raw Material	Range
		%wt
Soap Base	Fatty Acid Soaps	10-35
	Aqua	15-30
	Propylene Glycol	15-30
	Glycerine	5-15
	Sorbitol	5-15
	Dipropylene Glycol	5-15

[0050] When considering these compositions, it is clear that block C is the only toilet block that is according to the invention. Block A only contains a soap base whereas block B contains a soap base, some co-surfactants, perfume and minors.

[0051] Using these blocks A, B and C, a cylinder test was carried having the following method steps:

- a transparent graduated cylinder was filled with 200 ml water having a temperature of 18°C and a water hardness of 8-9 °F;
- one of the toilet blocks A, B or C (having a weight of 5 grams) was sunk into the thus-filled cylinder;
- after a time period of 30 seconds the cylinder was rotated with a speed of 28 rpm.
- after 10 full rotations, the rotation of the cylinder was stopped , the foaming performance was evaluated by measuring the foam height.
- said foam height was measured at 0 seconds (i.e. immediately after stopping the rotation), at 60 seconds, and at 120 seconds.

[0052] This cylinder test was carried out for each of these blocks A, B and C. All evaluations were repeated twice.

[0053] In Table 4 the results in terms of the average foam height obtained for each of the tested blocks are shown.

Table 4

	Foam height (in cm), after		
	0 sec	60 sec	120 sec
Block A	0	0	0
Block B	1.5	0	0
Block C	5	5	5

5

[0054] These results clearly show that only when using block C (the only tested block which is according to the

invention) a stable foam could be obtained.

10

Claims

- 15 1. A hard surface cleaning composition in the form of a toilet block, wherein the composition comprises fatty acid soap, a co-surfactant; and from 1 to 30% by weight of a foam boosting and stabilizing ingredient selected from the group consisting of C₈-C₂₀ alkyl triamines, C₈-C₂₀ alkyl dipropylene triamines, C₈-C₂₀ alkyl diethylene triamines and mixtures thereof.
- 20 2. Cleaning composition according to claim 1, wherein the foam boosting and stabilizing ingredient is selected from C₁₀ alkyl dipropylene triamine, C₁₂ alkyl dipropylene triamine and mixtures thereof.
3. Cleaning composition according to claim 1 or claim 2, wherein the co-surfactant is selected from the group consisting of nonionic surfactants, anionic surfactants, amphoteric surfactants and mixtures thereof.
- 25 4. Cleaning composition according to any of claims 1-3, wherein the co-surfactant is present in a concentration of from 5 to 50 % by weight.
5. Cleaning composition according to any of claims 1-4, wherein the fatty acid soap is selected from long chain soaps having a C₁₀-C₂₀ alkyl group.
- 30 6. Cleaning composition according to claim 5, wherein the fatty acid soap is selected from sodium laurate, sodium stearate, sodium oleate, sodium palmate and mixtures thereof.
- 35 7. Cleaning composition according to any of claims 1-6, wherein said composition is transparent as defined herein.
8. Cleaning composition according to any of claims 1-7, wherein said composition is in the form of a cast toilet block.

Patentansprüche

- 40 1. Reinigungszusammensetzung für harte Oberflächen in Form eines Toilettenblocks, wobei die Zusammensetzung Fettsäureseife, ein Co-Tensid und von 1 bis 30 Gewichts-% eines schaumverstärkenden und stabilisierenden Bestandteils enthält, ausgewählt aus der aus C₈-C₂₀-Alkyltriaminen, C₈-C₂₀-Alkyldipropylentriaminen, C₈-C₂₀-Alkyldiethylentriaminen und Mischungen davon bestehenden Gruppe.
- 45 2. Reinigungszusammensetzung nach Anspruch 1, wobei der schaumverstärkende und stabilisierende Bestandteil aus C₁₀-Alkyldipropylentriamin, C₁₂-Alkyldipropylentriamin und Mischungen davon ausgewählt ist.
- 50 3. Reinigungszusammensetzung nach Anspruch 1 oder 2, wobei das Co-Tensid aus der aus nichtionischen Tensiden, anionischen Tensiden, amphoteren Tensiden und Mischungen davon bestehenden Gruppe ausgewählt ist.
4. Reinigungszusammensetzung nach irgendeinem der Ansprüche 1-3, wobei das Co-Tensid in einer Konzentration von 5 bis 50 Gewichts-% vorliegt.
- 55 5. Reinigungszusammensetzung nach irgendeinem der Ansprüche 1-4, wobei die Fettsäureseife aus langkettigen Seifen mit einer C₁₀-C₂₀-Alkylgruppe ausgewählt ist.

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6. Reinigungszusammensetzung nach Anspruch 5, wobei die Fettsäureseife aus Natriumlaurat, Natriumstearat, Natriumoleat, Natriumpalmitat und Mischungen davon ausgewählt ist.
7. Reinigungszusammensetzung nach irgendeinem der Ansprüche 1-6, wobei die Zusammensetzung transparent ist, wie hier definiert.
8. Reinigungszusammensetzung nach irgendeinem der Ansprüche 1-7, wobei die Zusammensetzung in Form eines gegossenen Toilettenblocks vorliegt.

Revendications

1. Composition de nettoyage de surface dure dans la forme d'un bloc pour toilettes, dans laquelle la composition comprend un savon d'acide gras, un co-tensioactif ; et de 1 à 30 % en masse d'un ingrédient stabilisant et favorisant la mousse choisi dans le groupe constitué d'alkyltrialamines en C₈-C₂₀, d'alkyldipropylènetriamines en C₈-C₂₀, d'alkyldiéthylènetriamines en C₈-C₂₀, et de mélanges de celles-ci.
2. Composition de nettoyage selon la revendication 1, dans laquelle l'ingrédient stabilisant et favorisant la mousse est choisi parmi une alkyldipropylènetriamine en C₁₀, une alkyldipropylènetriamine en C₁₂ et des mélanges de celles-ci.
3. Composition de nettoyage selon la revendication 1 ou la revendication 2, dans laquelle le co-tensioactif est choisi dans le groupe constitué de tensioactifs non ioniques, de tensioactifs anioniques, de tensioactifs amphotères et de mélanges de ceux-ci.
4. Composition de nettoyage selon l'une quelconque des revendications 1-3, dans laquelle le co-tensioactif est présent dans une concentration de 5 à 50 % en masse.
5. Composition de nettoyage selon l'une quelconque des revendications 1-4, dans laquelle le savon d'acide gras est choisi parmi des savons à chaîne longue présentant un groupe alkyle en C₁₀-C₂₀.
6. Composition de nettoyage selon la revendication 5, dans laquelle le savon d'acide gras est choisi parmi le laurate de sodium, le stéarate de sodium, l'oléate de sodium, le palmate de sodium et des mélanges de ceux-ci.
7. Composition de nettoyage selon l'une quelconque des revendications 1-6, dans laquelle ladite composition est transparente comme définie ici.
8. Composition de nettoyage selon l'une quelconque des revendications 1-7, dans laquelle ladite composition est dans la forme d'un bloc coulé pour toilettes.

REFERENCES CITED IN THE DESCRIPTION

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