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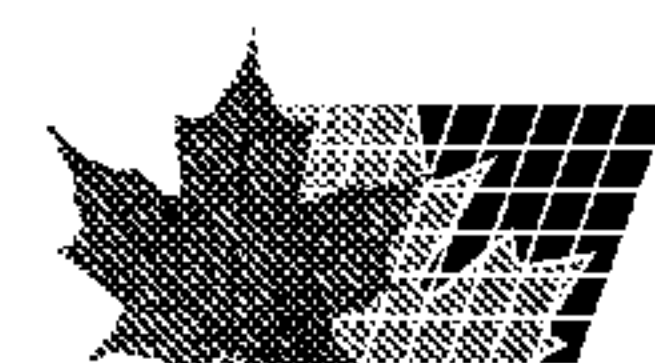
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(57) **Abrégé/Abstract:**

Improved foam behaviour and a reduction in stickiness during manufacture is shown in lavatory blocks which comprise 2-15 wt.% of oily liquid perfume, 2-30 wt.% of halogen bleaching agent, 3-15 wt.% of primary alkyl sulphate, and, 15-50 wt.% of alkyl benzene sulphonate.





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(54) Title: IMPROVEMENTS RELATING TO LAVATORY CLEANING BLOCKS (57) Abstract Improved foam behaviour and a reduction in stickiness during manufacture is shown in lavatory blocks which comprise 2-15 wt.% of oily liquid perfume, 2-30 wt.% of halogen bleaching agent, 3-15 wt.% of primary alkyl sulphate, and, 15-50 wt.% of alkyl benzene sulphonate.		

- 1 -

IMPROVEMENTS RELATING TO
LAVATORY CLEANING BLOCKS

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Technical Field

10 The present invention relates to lavatory blocks including those which are intended, in use, to be located 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. Such blocks are generally known in the art as 'rim blocks' and will be referred to as such or simply as 'blocks' herein.

15 The invention also relates to so-called 'in-cistern' blocks which sit in the cistern of a lavatory or urinal and slowly dissolve in the water contained therein.

20

Background to the Invention

Lavatory blocks produce foam, often produce a pleasing odour and can have germicidal properties. These germicidal properties can be due to the presence of

25 bleaching species such as the so-called 'chlorine release agents', other oxygen bleaches such as peroxides and non-bleaching species such as quaternary ammonium compounds or halogenated materials which do not release hypohalous acids in use.

30

WO 92/03532 (Jeyes) discloses that rim blocks generally comprise a surfactant component and a solubility retarding component or 'filler'. Typically, the surfactant component is an anionic surfactant which is present at a

35 level of 5-85% by weight of the block.

- 2 -

A number of different anionic surfactant systems are known for rim blocks. These comprise mixtures of two or more of primary alkyl sulphate (PAS), alkyl sulphates (AS) which may be branched, secondary alkyl sulphates (SAS) alkyl ether sulphates (AES) and alkyl benzene sulphonates (LAS) or the essentially pure surfactant materials. US 4874536 discloses that AS/LAS mixtures can be used in blocks which are free of oxygen bleaching species. WO 95/11958 discloses the use of PAS/AES mixtures again in bleach-free blocks. WO 96/14392 discloses the use of PAS/LAS mixtures in bleach-free blocks. EP 0619367 discloses the presence of PAS/LES in bleach-free blocks. EP 0184416 discloses LAS/PAS in bleach free-blocks. GB 2169612 LAS/PAS in bleach-free blocks. GB 2178442 discloses the use of LAS/PAS mixtures in blocks which comprise two halogen bleaching agents.

EP 0462643 (Unilever) discloses how blocks which comprise halogen bleaching agents can be improved by the incorporation therein of an oily liquid perfume component. We have found that one problem with these bleach/perfume blocks is that the presence of the bleaching agent requires that relatively high levels of the perfume are present for moderate term stability. Moreover the bleaching agent also replaces a portion of the filler which is typically present. The presence of the perfume and bleach leads to a 'sticky' block which can be difficult to produce using the extrusion technique which is commonplace in manufacture of these blocks.

It also is advantageous that a block should produce a copious foam when first installed, i.e. during the first 50-80 flushes and continue to produce copious foam during a significant part of the lifetime of the block.

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- 3 -

Brief Description of the Invention

5 We have determined that improved foaming properties and/or a lack or reduction of stickiness in bleach and perfume containing blocks are obtained by the use of a particular surfactant system which comprises primary alkyl sulphate (PAS) together with alkyl benzene sulphonate (LAS) at specified levels.

10 Accordingly the present invention provides a lavatory block comprising:

- a) 2-15%wt of oily liquid perfume structurant,
- 15 b) 2-30%wt of halogen bleaching agent,
- c) 3-15%wt of primary alkyl sulphate, and,
- d) 15-50%wt of alkyl benzene sulphonate.

20 Without wishing to limit the invention by reference to any theory of operation, it is believed that the PAS and LAS form a phase which can adsorb some of the perfume present and prevent the development or expression of stickiness.

25 This facilitates the manufacture of blocks by the process in which the mixture is extruded into a bar which is then cut into individual blocks. It also is believed that the combination of PAS together with ABS promotes the foaming and the perfume delivery from the block.

30 Accordingly a further aspect of the present invention subsists in the use of 3-15%wt primary alkyl sulphate and 15-50%wt of alkyl benzene sulphonate to reduce stickiness in a process for the manufacture of a lavatory block

35 comprising 2-15%wt of oily liquid perfume and 2-30% of halogen bleaching agent.

- 4 -

Detailed Description of the Invention

- The preferred ratio of the primary alkyl sulphate and the alkyl benzene sulphonate is 1:1 to 1:5 in terms of PAS:LAS, most preferably around 1:3 in terms of PAS:LAS. Particularly suitable materials are PAS with an average alkyl chain length of C10-C16 and alkyl benzene sulphonate with an average alkyl chain length of C10-C16.
- Preferably the blocks according to the invention contain less than 5%wt of other surfactant components and more preferably the blocks are free of other surfactant components.
- Optionally, the blocks according to the invention further comprise a processing aid to further assist in extrusion. Suitable processing aids include oils (including both mineral and silicone oils), esters (e.g. methyl decanoate), liquid ketones (e.g. 2-decanone), liquid tertiary alcohols (e.g. 2-methyl hexan 2-ol) and polybutene. One suitable processing aid is an alkoxylated alcohol. It is preferred that the alkoxylated alcohol is an ethoxylated alcohol. When present the preferred level of alkoxylated alcohol is 0.75-2%wt. The preferred ethoxy chain length is 40-60 with an average ethoxy chain length of around 50 being preferred. Suitable materials include Empilan KM 50/KF (TM) ex. Albright & Wilson. Another suitable process aid is a PEG monostearate. PEG 4000 Monostearate (100%) ex DAC is a suitable raw material.
- Advantageously, the blocks according to the invention are free of this processing aid.

Typically, blocks according to the present invention comprise 0 to 50% by weight of an inert and/or electrolyte filler. Preferably blocks contain 5-50%wt of filler. Suitable fillers include ionic (soluble) fillers and inert

- 5 -

(insoluble) fillers. Suitable fillers include one or more of urea, sodium, magnesium and calcium carbonates, sodium chloride, borax, talc and sodium, magnesium and calcium sulphates. Preferred ionic fillers include sodium sulphate. It has been found advantageous to include at least sparingly soluble salts of the metals barium, cadmium, copper, iron, manganese or nickel so as to modify the in-use lifetime of the block.

Preferred inert fillers include calcium carbonate. Typical levels of total filler range from 20-50%wt on product in total. Preferred levels of filler are 10-20%wt on product of ionic filler and 10-20% on product of inert filler. It is particularly preferred to use an approximately 50:50 mixture of sodium sulphate and calcium carbonate as the filler. Typical levels in product are 13-17%wt of each of calcium carbonate and sodium sulphate. It is generally preferred that for in-cistern blocks the inert filler is absent to prevent residues on block dissolution.

Where the inert filler is sparingly soluble, such as with calcite, it has been found useful to employ an inert filler with a narrow cut large particle size such that dissolution and re-precipitation of the calcite is minimised. Where inert filler is present, Calcitec SG (TM) has been found to be a suitable material.

Suitable halogen bleaching agents are those which are at least sparingly soluble in water. The active chlorine bleaching agents are preferred. Suitable water-soluble, active chlorine, bleaching agents used in accordance with the invention include chlorinated cyanurates, phthalimides, p-toluene sulphonamides, azodicarbonamides, hydantoins, glycoluracils, amines and melamines. Other chlorine release agents such as calcium hypochlorite may

- 6 -

be employed. The alkali metal salts of cyanurates are preferred.

5 A particularly preferred bleaching agent comprises at least one N-chlorinated cyanuric acid derivative, more preferably sodium dichlorocyanurate (NaDCCA). The bleaching agent is preferably present in an amount of 10 to 25% by weight, most preferably at around 15%wt. Oxidan DCN/WSG (TM) ex Sigma has been found to be a suitable
10 bleaching agent.

Preferably, the blocks comprise 4-10% by weight of the perfume. Levels of 5-8% perfume are particularly preferred. This is most preferably the liquid oily
15 perfume structurant of the kind described in the European patent application EP 167210. It will be understood that the liquid oily perfume must be stable in the presence of the particular water-soluble, active chlorine, bleaching agent selected. It is believed that substituted
20 quinolines, cedryl methyl ether and cineole are all suitably stable perfume components.

Suitable commercially available oily perfumes can be easily selected by testing them in combination with the
25 water-soluble, active chlorine, bleaching agent. Examples of suitable bleach-stable perfumes are Verdeo 898, Bonanza 048 and Ponderosa 431 all ex IFF, and LB 132 ex Quest. Particularly preferred perfumes are Icebreaker Super Mod, Oxygen Supra Mod, Motebianco Supra, Montebianco Turbo7 and
30 Lemonfit Supra (all TM) ex Givaudan Roure.

Minor components will generally be present but are optional. These include colouring agents, and/or whiteners. These materials should be chosen such that
35 they are compatible with the bleaching agent and do not react therewith to a significant extent. We have

WO 97/47721

PCT/EP97/02501

- 7 -

determined that 'Sudangelb 150' (TM) ex. Sandoz is an acceptable colouring agent as are Colanyl Green (TM) ex Hoechst and Dispers Blue (TM) ex BASF. Titanium dioxide is an acceptable whitener. A further optional minor
5 component is a foam-boosting surfactant such as an amine oxide.

Blocks according to the present invention are manufactured by an extrusion process as known in the art: i.e. the
10 ingredients are mixed to form a dough, which is then extruded into a rod or bar which is cut into blocks of suitable lengths. As used herein the term block is not intended to limit the shape of the eventual product. For rim-blocks the rod is generally cut into lengths which are
15 long relative to their diameter and for cistern blocks the rod is cut into lengths which are short relative to their diameter. Preferably the blocks are extruded as a single composition, to give a homogenous block.

20 Rim blocks according to the present invention are typically used in a cage which is adapted to be suspended from the rim of the toilet bowl in such a manner that flush water flows over and through the cage when the cistern of the toilet is discharged. A particularly
25 preferred embodiment of the present invention comprises a block according to the claims appended hereto in combination with a cage which retains the block, said cage being provided with a hook for attachment of the cage to the rim of a toilet bowl.

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- 8 -

Particularly preferred compositions are:

	4-15%wt	primary alkyl sulphate
	15-50%wt	alkyl benzene sulphonate
5	2-30%wt	at least one N-chlorinated cyanuric acid derivative, preferably NaDCCA
	10-50%wt	Sodium sulphate, calcium carbonate or a mixture thereof,
	2-15%wt	Perfume
10	0-5%wt	Colour and/or optical brightener

In order that the invention may be further understood it will be described hereafter by way of the following non-limiting examples.

15

Examples

The components listed in Table 1 below were mixed in the proportions specified and extruded in the form of a bar which was then cut into blocks. All proportions are given in weight % as throughout the specification unless stated otherwise. Examples 1-2 and 4 are embodiments of the invention and example 3 is a comparative example.

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WO 97/47721

PCT/EP97/02501

- 9 -

The following materials were used:

- | | | |
|----|--|---|
| | Nonionic | Empilan KM 50/KF (TM, ex. Albright and Wilson) |
| 5 | Process Aid | PEG 4000 Monostearate (100%) ex DAC |
| | Anionics (ABS) | Nansa HS 80/GPF (TM, ex. Albright and Wilson) |
| | (PAS) | Empicol LZ-V (TM, ex. Albright and Wilson) |
| 10 | Bleaching agent | Oxidan DCN/WSG (TM, ex Sigma). |
| | Ionic Filler | Sodium Sulphate |
| | Inert Filler | Calcium Carbonate (Calcitec SG [TM] ex. Mineraria Sacilese) |
| 15 | Perfume (Montebianco Turbo 7 [TM] ex. Givaudan Roure) was present at 6.5-7%, whitener (titanium dioxide) when present at 0.071 and colour (Colanyl Green ex. Hoechst) at 0.024% or less. | |
| 20 | Compositions are given in the upper part of table 1 while foam height results obtained from toilet flushing experiments with formulations 1-4 are given in the lower part. In the foam height results the figure given is the foam height in cm which is attained directly after the | |
| 25 | flush. | |

WO 97/47721

PCT/EP97/02501

- 10 -

Table 1

Example	1	2	3	4
	Composition			
Bleaching agent	15	15	15	15
Ionic Filler	15	15	10.2	15.98
Inert Filler	7.3	14.5	4.36	14.7
Perfume	6.5	6.5	6.5	6.5
Colour	0.024	0.024	0.024	0.024
Whitener	-	-	0.07	-
Process Aid	-	-	1.0	-
Nonionic	-	-	3.0	-
PAS	10	10	-	10
ABS	35	30	47.8	30
Water	to 100	to 100	to 100	to 100
Results				
Flush	Foam Height			
1	2.4	2.5	1.0	2.5
5	3.3	3.5	1.5	3.5
15	3.4	3.5	3.0	3.5
30	4.0	4.0	3.0	4.0
50	4.0	4.0	3.0	4.4
105	4.5	4.5	3.3	5.0
150	4.7	4.7	3.3	5.0
210	4.5	4.5	3.2	4.6
250	4.0	4.0	3.0	4.5
300	3.5	3.5	3.0	4.0
350	3.0	3.0	2.0	3.5
400	2.5	2.5	2.0	2.8
500	2.0	2.0	1.3	2.0
600	0.5	0.5	0.5	0.5

WO 97/47721

PCT/EP97/02501

- 11 -

From the results given in table 1 it can be seen that blocks which contain a conventional surfactant system (comparative example 3) have a significantly lower level of foam than blocks which contain PAS (examples 1-2 and 4). Empirical observation during the manufacturing process indicated that far less stickiness, as assessed by the operator, was observed during the manufacture of blocks according to examples 1,2 and 4 than during manufacture of 'standard' blocks according to example 3.

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WO 97/47721

PCT/EP97/02501

- 12 -

Claims

1. A lavatory block comprising:

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- a) 2-15%wt of oily liquid perfume,
- b) 2-30%wt of halogen bleaching agent,
- 10 c) 3-15%wt of primary alkyl sulphate, and,
- d) 15-50%wt of alkyl benzene sulphonate.

15 2. A block according to claim 1 wherein the halogen bleaching agent is selected from the group comprising chlorinated cyanurates, phthalimides, p-toluene sulphonamides, azodicarbonamides, hydantoins, glycoluracils, amines, melamines and mixtures thereof.

20 3. A block according to claim 1 which comprises:

- 25 4-15%wt primary alkyl sulphate,
15-50%wt alkyl benzene sulphonate,
2-30%wt at least one N-chlorinated cyanuric acid derivative, comprising said halogen bleaching agent,
10-50%wt Sodium sulphate, calcium
30 carbonate or a mixture thereof,
2-15%wt Perfume, and,
0-5%wt Colour and/or optical brightener.

35 4. A block according to claim 3 wherein the N-chlorinated cyanuric acid derivative is sodium dichlorocyanurate.

WO 97/47721

PCT/EP97/02501

- 13 -

5. The use of 3-15%wt primary alkyl sulphate and 15-50%wt of alkyl benzene sulphonate to reduce stickiness in a process for the manufacture of a lavatory block comprising 2-15%wt of oily liquid perfume and 2-30% of halogen bleaching agent.