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- (72) Inventors: KLINKHAMMER, Michael, E.; 3519 - 21st Street, Racine, WI 53405 (US). MOODYCLIFFE, Timothy, L.; 270 East Highland Avenue, Apt. 224 The Blatz, For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

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(54) Title: TOILET BOWL CLEANING METHOD

(57) Abstract: Disclosed herein are methods of cleaning toilet basins and urinals. Cleaning components are applied to the interior surfaces of these basins other than through the flush water, without scrubbing. They are allowed to be in contact with the surface of the basin for at least one-half hour before normal use of the toilet/urinal. Preferred methods for applying the cleaning compositions are with a spray bottle or an aerosol can, with application occurring on a daily, overnight basis.

TOILET BOWL CLEANING METHOD

CROSS REFERENCE TO RELATED APPLICATIONS

Not applicable.

5 STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH

Not applicable.

BACKGROUND OF INVENTION

10 The present invention relates to a method of cleaning plumbing fixtures. More particularly it relates to a method of cleaning toilet bowls and urinals which alleviates the need for scrubbing or manually wiping the basin to work in the cleaner.

15 A variety of toilet bowl cleaners are known which are intended to be used by scrubbing them against a toilet basin. In some cases the cleaners are liquids that are squirted from a bottle against the basin (e.g. "Liquid Toilet Duck" sold by S.C. Johnson & Son, Inc.). In other cases the cleaners are aerosol sprays that are sprayed against the side of the basin (e.g. "Vanish" toilet bowl cleaner sold by S.C. Johnson & Son, Inc.).

20 It is also known in the art to provide a product that is sprayed against a shower or bathtub wall immediately after the use of the shower or bathtub which keeps the tub or shower cleaner without the need for wiping. This is described in U.S. patent 5,587,022 (see also the related U.S. patents 5,536,452 and 5,587,664, and the related PCT publications WO 96/22346 and WO 98/02511).

25 However, toilet and urinal basins are designed to receive contaminated waste. Even after flushing, the basins often sit partially filled with hard water that contains minerals that can stain a bowl (e.g. leave a ring). Existing cleaning formulations that are designed to keep showers or bathtubs relatively clean without scrubbing are ineffective for toilet basins and urinals.

A variety of techniques have been developed for delivering cleaning compounds via the flush water that sits in a toilet bowl. However, delivering the cleaning solution to the water of the bowl in this way dilutes the cleaning material. Moreover, such systems are less effective for the portion of the bowl above the water line.

5 With respect to urinals, blocks of disinfecting materials have been positioned near the outlet of the basin, sometimes in or on top of ice. However, such materials are not designed to clean the side walls of the basin.

In that the prior art has not to date provided a satisfactory way of cleaning the side walls of a toilet or urinal basin which alleviates the need for scrubbing or wiping a cleaner 10 against the basin, sponges, brushes and the like that have been contaminated with toilet bowl water and cleaner still need to be stored between uses.

Thus, a need exists for improved methods of cleaning toilet bowls and urinals.

SUMMARY OF THE INVENTION

According to a first aspect, the present invention consists in a method of cleaning a 15 basin of a plumbing fixture selected from the group consisting of toilet bowl basins and urinal basins, the basin having a drain opening and a side wall portion extending upwardly therefrom, the method comprising:

applying a cleaning composition containing water and

(i) a cationic surfactant or

20 (ii) an anionic surfactant

to the side wall portion other than via flush water; there being one but not both of cationic surfactant and anionic surfactant in the composition; and

allowing the cleaning composition to remain on the wall portion for at least one half hour after it is applied on the wall portion;

25 wherein the method is completed without the cleaning composition being scrubbed against or manually wiped against the wall.

According to a second aspect, the present invention consists in a method of cleaning a basin of a plumbing fixture selected from the group consisting of toilet bowl basins and urinal basins, the basin having a drain opening and a side wall portion extending 30 upwardly therefrom, the method comprising:

applying a cleaning composition containing water and a surfactant to the side wall portion other than via flush water; and

allowing the cleaning composition to remain on the wall portion for at least one half hour after it is applied on the wall portion;

wherein the method is completed with the cleaning composition being scrubbed against or manually wiped against the wall, and

wherein the cleaning composition comprises anionic surfactant present in a range of 0% to 10% by weight or cationic surfactant present in a range of 0% to 10% by weight, there being one but not both of cationic surfactant and anionic surfactant in the composition, non-ionic surfactant being present in a range of 0.2% to 10% by weight, sulphamic acid being present in a range of 0% to 5% by weight or sodium salt of EDTA being present in a range of 0% to 15% by weight, and fragrance being present in a range of 0% to 3% by weight.

According to a third aspect, the present invention consists in a method of cleaning a basin of a plumbing fixture selected from the group consisting of toilet bowl basins and urinal basins, the basin having a drain opening and a side wall portion extending upwardly therefrom, the method comprising:

applying a cleaning composition to the side wall portion other than via flush water, wherein the cleaning composition comprises water, anionic surfactant present in a range of 0.00% to 10.00% by weight or cationic surfactant present in a range of 0.00% to 10.00% by weight, there being one but not both of cationic surfactant and anionic surfactant in the composition, non-ionic surfactant being present in a range of 0.20% to 10.00% by weight, sulphamic acid being present in a range of 0.00% to 5.00% by weight or sodium salt of EDTA being present in a range of 0.00% to 15% by weight, and fragrance being present in a range of 0.00% to 3.00% by weight; and

allowing the cleaning composition to remain on the side wall portion for at least one half hour after it is applied on the side wall portion,

wherein the cleaning composition is applied to the side wall portion via a pump spray or an aerosol spray, and

wherein the method is completed without the cleaning composition being scrubbed against or manually wiped against the side wall portion.

In one aspect the invention provides a method of cleaning a basin of a plumbing fixture selected from the group consisting of toilet bowl and urinal basins. Such basins have a drain opening and a side wall portion extending upwardly therefrom. One applies a cleaning composition containing at least water and a surfactant to the side wall portion other than via flush water. One then allows the cleaning composition to remain on the side wall portion for at least one half hour (preferably at least an hour, even more preferably at least six hours) after it is applied. The method is completed without the

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cleaning composition being scrubbed against or manually wiped against the wall, and without the composition being completely rinsed off the wall during the period.

The surfactant can be any of the known anionic, nonionic, cationic or zwitterionic surfactants that are



suitable for use in a toilet bowl environment, albeit a mixture of either nonionic and anionic, or nonionic and cationic, surfactants is preferred for this purpose.

5 In a further aspect, the basin is a toilet bowl basin having a top portion, and the cleaning composition is applied at least between the top portion and a normal "water line" of the basin (the normal fill level of the basin).

The cleaning composition is preferably delivered via a spray so that the cleaning composition will in large part
10 adhere to the bowl sides above the water (rather than primarily running down into the bowl water). A pump sprayer can be used to deliver the material, or the material can be combined with an aerosol gas propellant (such as propane, butane, isobutane, and mixtures thereof) and then delivered
15 from an aerosol can.

These and still other features of the present invention will be apparent from the description which follows. The following description is of the preferred embodiments. However, the claims should be looked to in order to better
20 understand the full scope of the invention.

DETAILED DESCRIPTION

Example 1 - nonionic mixed with cationic - pump spray

One preferred liquid spray type cleaner has the following formula:

25	ingredient		preferred source	weight %
	water			97.522
	ethoxylated alcohol		Lutensol A08	1.00
	sodium lauryl ether sulfate		Steol 4N	0.500
	sulphamic acid			0.500
30	fragrance			0.250
	cellulosic thickener		Rheozan	0.220
	dye		Pigmosol blue 6900	0.008

Example 1 was applied to a toilet bowl by spraying it from a pump trigger bottle in which it was contained. The product was sprayed in a manner to cover the entire inside wall of the bowl above the water line and below the rim.

5 About 10 g of spray was required to achieve desired coverage. The applied product was allowed to remain in contact with the bowl for a minimum of one-half hour (preferably at least six hours - over night), after which the toilet could be used in the usual manner.

10 This procedure was repeated once a day for four weeks. This resulted in the removal of all visible stains and deposits, and prevented further stains from forming on the bowl sides above the water line.

Example 2 - nonionic and cationic - aerosol

15 An aerosol form of the invention has the following formula:

ingredient	preferred source	weight %
deionized water		76.692720
tetrasodium salt EDTA		10.152000
20 ethylenediamine tetraacetic acid		0.122200
diethelene glycol butyl ether		5.64000
25 nonylphenol ethoxylated alcohol Tergitol NP-10	Union Carbide	0.188000
nonionic surfactant	Sandoxylate SX-424 -Clariant Corporation	0.188000
fragrance		0.094000
30 isobutane		6.000000
miristalammonium chloride and quaternium 14- disinfectant/surfactant	Stepan	0.406080

Example 2 was sprayed into a toilet bowl in essentially the same manner as described in Example 1 for the spray bottle, albeit from an aerosol can. It was applied at the same intervals and with similar results.

5 Example 3 - pump spray

The following formulation is also suitable for use with a trigger nozzle delivery system:

	ingredient	preferred source	weight %
	water		92.787
10	Ammonyx DO C10 amine oxide	Stepan	1.67
	Glucopon 325 NK	Henkel	1.5
	bactericide BTC 2125M, 80%	Stepan	0.27500
15	fragrance		0.150
	propylene glycol monobutylether		3.0
	tetrasodium salt of EDTA 40%		0.4
20	caustic soda, 50%		0.218

Other Variations

While certain specific ingredients have been described as being useful for formulations of the present invention, these can be varied. For example, the anionic surfactant is preferably 0 to 10% of the formulation, the cationic surfactant is preferably 0 to 10% of the formulation, the nonionic surfactant is preferably .2 to 10% of the formulation, and there is preferably up to 5% sulphamic acid or up to 15% tetrasodium salt of EDTA, and up to 3% fragrance. There is also preferably more than 75% water. There can also be other additives and dyes as are conventional with toilet bowl cleaners.

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While this invention has been described above in connection with cleaning a toilet bowl, it can also be effectively employed in conjunction with a urinal. The cleaner composition would be applied along the inner side walls of the urinal. As in conjunction with a toilet bowl, the cleaner could be applied on a daily basis and preferably at the end of the day. It should be allowed to remain in contact with the inner surface of the urinal for at least one half hour, and preferably six hours, before rinsing.

10 Industrial Applicability

The invention provides a method of cleaning urinals and toilets which receive flushable waste.

The claims defining the invention are as follows:

1. A method of cleaning a basin of a plumbing fixture selected from the group consisting of toilet bowl basins and urinal basins, the basin having a drain opening and a side wall portion extending upwardly therefrom, the method comprising:
 - 5 applying a cleaning composition containing water and
 - (i) a cationic surfactant or
 - (ii) an anionic surfactant
 to the side wall portion other than via flush water; there being one but not both of cationic surfactant and anionic surfactant in the composition; and
 - 10 allowing the cleaning composition to remain on the wall portion for at least one half hour after it is applied on the wall portion;
 wherein the method is completed without the cleaning composition being scrubbed against or manually wiped against the wall.
 2. The method of claim 1, wherein the cleaning composition is allowed to
 - 15 remain on the wall portion for at least one hour after it is applied on the side wall portion.
 3. The method of claim 1 or 2, wherein the cleaning composition is allowed to remain on the wall portion for at least six hours after it is applied on the side wall portion.
 4. The method of any one of claims 1 to 3, wherein the plumbing fixture is a toilet bowl having a top portion and the cleaning composition is applied along the side
 - 20 wall portion at least between the top portion and a normal water level line of the toilet bowl.
 5. The method of any one of claims 1 to 4, wherein the cleaning composition further comprises an aerosol propellant gas.
 6. The method of any one of claims 1 to 5, wherein the cleaning composition
 - 25 comprises both a nonionic and an anionic surfactant.
 7. The method of any one of claims 1 to 5, wherein the cleaning composition comprises both a nonionic and a cationic surfactant.
 8. The method of any one of claims 1 to 7, wherein the cleaning composition comprises a disinfectant.
 9. The method of any one of claims 1 to 8, wherein the composition is not
 - 30 completely rinsed off the side wall portion during the period.
 10. The method of any one of claims 1 to 9, wherein the cleaning composition comprises more than 75% water.

11. The method of any one of claims 1 to 10, wherein the anionic surfactant is present in a range of 0.00wt% to 10.00wt%, the cationic surfactant is present in a range of 0.00wt% to 10.00wt%, a nonionic surfactant is present in a range of 0.20wt% to 10.00wt%, sulphamic acid is present in a range of 0.00wt% to 5.00wt% or sodium salt of EDTA is present in a range of 0.00wt% to 15wt%, and fragrance is present in a range of 0.00wt% to 3.00wt%.

12. A method of cleaning a basin of a plumbing fixture selected from the group consisting of toilet bowl basins and urinal basins, the basin having a drain opening and a side wall portion extending upwardly therefrom, the method comprising:

10 applying a cleaning composition containing water and a surfactant to the side wall portion other than via flush water; and

allowing the cleaning composition to remain on the wall portion for at least one half hour after it is applied on the wall portion;

wherein the method is completed with the cleaning composition being scrubbed
15 against or manually wiped against the wall, and

wherein the cleaning composition comprises anionic surfactant present in a range of 0% to 10% by weight or cationic surfactant present in a range of 0% to 10% by weight, there being one but not both of cationic surfactant and anionic surfactant in the composition, non-ionic surfactant being present in a range of 0.2% to 10% by weight, sulphamic acid being present in a range of 0% to 5% by weight or sodium salt of EDTA being present in a range of 0% to 15% by weight, and fragrance being present in a range of 0% to 3% by weight.

13. A method of cleaning a basin of a plumbing fixture selected from the group consisting of toilet bowl basins and urinal basins, the basin having a drain opening and a side wall portion extending upwardly therefrom, the method comprising:

25 applying a cleaning composition to the side wall portion other than via flush water, wherein the cleaning composition comprises water, anionic surfactant present in a range of 0.00% to 10.00% by weight or cationic surfactant present in a range of 0.00% to 10.00% by weight, there being one but not both of cationic surfactant and anionic surfactant in the composition, non-ionic surfactant being present in a range of 0.20% to 10.00% by weight, sulphamic acid being present in a range of 0.00% to 5.00% by weight or sodium salt of EDTA being present in a range of 0.00% to 15% by weight, and fragrance being present in a range of 0.00% to 3.00% by weight; and

allowing the cleaning composition to remain on the side wall portion for at least one
35 half hour after it is applied on the side wall portion;

wherein the cleaning composition is applied to the side wall portion via a pump spray or an aerosol spray, and

wherein the method is completed without the cleaning composition being scrubbed against or manually wiped against the side wall portion.

5 14. The method of claim 13, wherein:

the cleaning composition is allowed to remain on the wall portion for at least one hour after it is applied on the side wall portion.

15 15. The method of claim 13 or 14, wherein the cleaning composition is allowed to remain on the wall portion for at least six hours after it is applied on the side wall portion.

10 16. A method of cleaning a basin of a plumbing fixture selected from the group consisting of toilet bowl basins and urinal basins, said method being substantially as hereinbefore described with reference to any of the examples.

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Dated 19 June, 2003
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