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DEODORANT AND GERMICIDAL BODIES FOR TOILETS AND URINALS

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No Drawing. Continuation-in-part of application Ser. No. 508,585, Nov. 18, 1965. This application July 8, 1966, Ser. No. 563,689
1 Claim. (Cl. 252—107)

ABSTRACT OF THE DISCLOSURE

A deodorant or germicidal in compressed body form for use with toilets and urinals having a predetermined controlled solubility through controlling the ratio of the components of soap, alkali, and water forming the body in which is incorporated the germicidal agent.

This application is a continuation-in-part of my co-pending application Ser. No. 508,585, filed Nov. 18, 1965, for "Deodorant and Germicidal Bodies for Toilets and Urinals."

The present invention relates to deodorant and germicidal bodies for toilets and urinals, and more particularly to compressed bodies in the form of tablets or blocks which can be used in association with toilets and urinals to maintain the same in substantially germ-free, odor-free condition over prolonged periods of time.

It is a primary object of the present invention to provide compositions in the form of tablets or blocks, (for convenience the application will hereinafter use the expression "tablet" to refer to all types of compressed or molded blocks or bodies of substantially solid material) which dissolve slowly as water is passed thereover and which upon slow dissolution release germicidal and the like agents into the toilet or urinal so as to substantially disinfect and thereby deodorize the same.

It is another object of the present invention to provide a method of deodorizing toilets and urinals over prolonged periods of time, measured in days and even weeks, by permitting controlled release of germicidal (including bactericidal and bacteriostatic) agents into toilets or urinals.

Other objects and advantages of the present invention will be apparent from a further reading of the specification and of the appended claims.

With the above and other objects in view, the present invention mainly comprises a tablet composed of a soap and at least one germicidal agent distributed therethrough, said soap including predetermined amounts of water and alkali, so that the entire composition dissolves slowly when water is passed thereover, and upon dissolution releases sufficient amounts of the germicidal agent to disinfect the region of release.

In accordance with the invention, the tablet is placed in a plumbing arrangement of the urinal or toilet type in such position that it is not in contact with water except upon flushing so that the passage of the water thereover during the flushing causes dissolution of a small amount of the tablet and release into the passing water of the germicidal agent. This, for all practical purposes, has the effect of eliminating odors arising from the toilet or urinal, the odors normally being caused by odor producing germs and bacteria which remain in the urinal or toilet. The tablets of the present invention will thus release the germicidal agent upon the flushing of the toilet or urinal over a period of a long time, several days, or possibly even weeks, and thus maintain the toilet or urinal in odor-free condition for the long period of time.

The user is thus freed of the necessity of applying frequent treatments of germicidal agents (bactericides and bacteriostatic agents) or from using mechanical dispensing devices designed to deliver such germicidal agents to the urinals and toilets.

The water contained in the soap base of the tablets of the present invention is present in the form of water of hydrolysis or water of crystallization, or both, and the adjustment of the amounts of water and of the amount of alkali permits the controlling of the solubility of the tablet and thereby of the release of the germicidal agent into the flushing water passing thereover. Further control in the degree of release of the germicidal agent is achieved by the addition of sugar and/or urea to the tablet.

The tablets of the present invention are effective in controlling odors usually arising from urinals and toilets to the point that the same are no longer noticeable. This is accomplished by the regulated release of the germicidal agents which kill or inhibit the growth of the micro-organisms which contribute to the development of bad odors. It is not necessary to use perfumes or masking agents to cover up, change or mask these odors, although it is of course possible to include such perfumes or masking agents in the tablets, if desired.

The tablets of the present invention are simply made by pressing the soap and alkali, together with the predetermined amount of water, and the selected germicidal agent or agents into tablets using ordinary molding or tabletting devices.

In the tablets of the invention, the soap delays the distribution of the germicidal agent, while the alkali and water, and possibly also the urea and/or sugar, increase the solubility of the tablet to the desired extent so that the flushing water passing over the same will dissolve a sufficient amount of the tablet and release a sufficient amount of the germicidal agent into the urinal or toilet. Thus, the solubility of the tablet is controlled to yield the ideal dilution of the germicidal agent by the selection of the amount of water, alkali, plus sugar and/or urea, and the soap phase of the tablet to release the desired amount of germicidal agent.

Where the tablet is used with urinal bowls which contain no water, the tablet is simply deposited on the drain. The urine and flushing water passing over the tablet thus will dissolve away an amount of the tablet and release the germicidal agent into the water.

In the case of urinal bowls or toilets which contain water, it is necessary to suspend the tablets above the water level and beneath the flushing apparatus so that only flushing water passes over the tablets, and the tablet does not remain in the water to be too rapidly dissolved therein.

The germicidal agents which are most desirable for the purposes of the present invention are very strong agents which are stable in aqueous solutions of soap or soap and alkali. It is desirable to include both bactericidal and bacteriostatic agents in the composition. Among the suitable agents for the purposes of the present invention are o-phenylphenol and 2,2'-methylenebis-3,4,6-trichlorophenol (which is also known as bis-(3,5,6-trichloro-2-hydroxyphenol or 2,2'-dihydroxy-3,5,6,3',5',6'-hexachlorodiphenylmethane). These two substances may be used separately or in combination with each other.

Other germicidal agents may be used, including hexachlorophene, quaternary ammonium salts such as p-diisobutyl phenoxy ethoxy ethyl dimethyl benzyl ammonium chloride monohydrate, or benzalkonium chloride, or 2,4,5-trichlorophenol, etc.

The amount of the germicidal agent can be varied within wide limits, although satisfactory results have been obtained with amounts of 2–5% by weight, and conse-

quently, greater amounts are not necessary from the economical standpoint.

The preferred soaps for the purposes of the invention are made from vegetable oils such as corn oil, cottonseed oil, soya oil, etc., with titers of 36–39°. However, the tablets of the invention can also be prepared using soaps made from animal fats such as tallow, grease or red oil, or from other vegetable oils such as palm, olive, etc. Soaps made from combinations of these oils can of course also be used.

Such soaps may be made in the so-called "pure" form, i.e. 86–97% of pure soap plus 14–3% of moisture, or in the form of "built soaps," whose final form includes alkalies such as phosphates, silicates, soda ash, etc., or in the form of "soap powders" wherein soda ash plus its water of crystallization constitute a part of the finished soap granule.

Sodium tripolyphosphate or sodium tetrapolyphosphate are desirable in the tablets in an amount of about 5–20% of the anhydrous soap in order to prevent the formation of insoluble lime or magnesium soap films on the tablets or on the urinals or in urinal bowls or toilets.

The amount of water of hydrolysis in the soap and alkali mixture performs an important function in determining the rate of solubility of the tablet, and it has been found for the purposes of the invention that a moisture content of about 2–50% by weight is preferred, with the most preferred moisture content being about 2–10% by weight. It has been found that high moisture contents results in tablet weight loss so that moisture contents in the lower range are preferred. Moisture contents within the range given herein provide for a properly controlled rate of release of the germicidal agent into the flushing water.

It has further been found according to the invention that the rate of dissolution may be further controlled by the addition of sugar and/or urea (crystals or prilled) or both in the tablet composition. In this manner, a satisfactory concentration of the germicide may be released on each use of the urinal or toilet by the flushing water passing thereover, the germicide being released to the surface of the urinal, drain opening, drain pipe and drain trap, so as to kill or inhibit the growth of the odor producing bacteria. It has been found that the urea and/or sugar speeds up the dissolution of the tablet regardless of whether high or low moisture soap or soap-alkali mixtures are used.

The control of solubility by the sugar, urea or both, is particularly satisfactory when the amount of the sugar and/or the urea constitutes about 5–70% by weight of the mixture, and is most satisfactory when the amount thereof is about 35–60% by weight of the mixture. Where the flushing water is normally from 40–70° F., it is preferable to use urea; when the temperatures of the water exceeding about 70° F., sugar is more suitable.

Thus, by controlling the moisture in the soap, the titer of the soap, the water of crystallization in the alkalies and the amount of urea and/or sugar, it is possible to arrive at a proper composition for releasing the germicidal agent incorporated into the tablet so as to assure the presence of sufficient germicidal agent on the surfaces of the system and in the trap water. In addition, the formula may be varied to compensate for different temperatures of water which will vary depending on the time of year, geographical location, temperature of the urinal parts, frequency of use, etc.

The alkalies which are used in combination with the soaps include soda ash, tetrasodium pyrophosphate, sodium tripolyphosphates, silicates, etc., either alone or in combination with each other, and constitute 3 to 40% of the tablet composition.

The preferred method of manufacturing the tablets comprises the incorporation of the germicidal agent in the soap during the crutching process, although it is equally possible to add the germicidal agent to the mixture before the tabletting operation.

Using "pure" siap, with a moisture content of about 3–14%, it is generally necessary to include sugar and/or urea in the final composition, which of course includes the germicidal agent, preferably in an amount of 2–5% by weight, in order to provide sufficient solubility for release of an adequate amount of the germicidal agent.

Using "pure" soap, with a moisture content of about from about 10–50%, though it is preferably between about 2–10%, and the amount of alkali remaining in the "built" soap is preferably between about 30–50%. The amount of pure soap in the thus used "built" soap would therefore be between about 3 and 35%.

As indicated previously, the amount of sugar and/or urea which may be contained in the tablets is preferably between about 5 and 70%, and most preferably it is between about 35 and 60%.

All percentages given are by weight.

The following examples are given to further illustrate the present invention. The scope of the invention is not, however, meant to be limited to the specific details of the examples.

Example 1

A tablet is made by normal tabletting procedure of the following components, in the percentages given, all percentages being by weight:

	Percent
Cottonseed oil soap	40
Soda ash	35
Moisture	23
o-Phenylphenol	1
2,2'-methylenebis-3,4,6-trichlorophenol	1

The formed tablet may be suspended in a urinal or toilet so that it does not rest in the water but in such manner that flushing water passes thereover. The tablet releases the germicidal agents upon flushing, and the toilet or urinal remains odor-free.

Example 2

A tablet is prepared by conventional tabletting procedure of the following composition:

	Percent
Corn oil-sodium soap	18
Tetrasodium pyrophosphate	40
Moisture	38
Benzyl-o-chlorophenol	2
Hexachlorophene	2

Example 3

Tablets are prepared using ordinary tabletting procedure, from the following components:

	Percent
Cottonseed oil soap	15
Sodium tripolyphosphate	40
Moisture	35
Sugar (sucrose)	7
o-Phenylpolyphenol	2
2,2'-methylenebis-3,4,6-trichlorophenol	1

The above tablets are particularly suitable where the temperature of the water exceeds 70° F.

Example 4

Tablets are prepared using ordinary tabletting procedure, from the following components:

	Percent
Tallow soap	[1] 43
Sodium tripolyphosphate	4
Sugar	44
o-Phenylphenol	2
2,2'-methylenebis-3,4,6-trichlorophenol	2
Binders and die lubricants	5

[1] Including 5–6% moisture.

The above tablets are particularly suitable where the temperature of the water exceeds 70° F.

The same tablets can be made, however, substituting urea for the sugar and the tablets are particularly suitable when the temperature of the flushing water is between about 40 and 70° F.

While the invention has been described in particular with respect to certain specific soap-alkali-germicidal agent compositions, it is to be understood that variations and modifications thereof can be made without departing from the spirit or scope of the invention. Such variations and modifications are accordingly meant to be comprehended within the scope of the appended claims.

What is claimed as new and desired to be secured by Letters Patent is:

1. Method of maintaining plumbing facilities in which flushing water is passed through, including toilets and urinals, in substantially odor-free condition over prolonged periods of time, which comprises arranging in the plumbing facility in the path of flushing water, but out of contact with any water therein, except when the facility is flushed, a tablet consisting essentially of, by weight, 35 to 70% of sugar, 15 to 40% of a soap of the group consisting of water soluble vegetable oil soap, animal fat soap and mixtures thereof, 3 to 40% of an alkali compound of the group consisting of tetrasodium pyrophosphate, sodium tripolyphosphate and mixtures thereof, 2 to 50% of water and 2 to 5% of a water soluble germicidal agent.

References Cited

UNITED STATES PATENTS

2,011,732	8/1935	Saeks	167—39
2,278,352	3/1942	Heald	252—109
2,296,767	9/1942	Caryl	252—138
2,316,689	4/1943	Heald	252—109
2,328,690	8/1943	Steele	167—39
3,084,097	4/1963	Reller et al.	252—107

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