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2,845,391

SYNTHETIC DETERGENT BAR

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No Drawing. Application December 17, 1953
Serial No. 398,892

9 Claims. (Cl. 252—138)

The present invention relates to a sulfonate detergent composition in the form of a solid bar or cake, which does not impart an objectionably tacky feeling to the skin after washing and is not susceptible to excessive and rapid erosion upon being wetted.

Considerable research endeavor has been directed in the past toward the production of a satisfactory "all-synthetic" sulfonate detergent bar or cake for toilet and bath use. In the majority of sulfonate detergent formulations the active detergent ingredient is an alkyl aryl sulfonate i. e., a water-soluble salt of an alkyl aryl sulfonic acid, preferably a sodium salt. Sodium salts of C_8 - C_{18} monoalkyl aryl sulfonic acids, and in particular sodium salts of C_8 - C_{18} monoalkyl benzene sulfonic acids, are generally supplied to the trade because they do not form insoluble compounds with calcium and magnesium ions present in hard water. They are manufactured by sulfonation of suitable alkyl benzene stocks, followed by neutralization of the sulfonation product mixture, and drying to the desired solid form. However, up to the present day, the application of these sulfonates in the manufacture of "all-synthetic" or "non-soap" detergent bars or cakes for toilet and bath use has been greatly handicapped by the presence of a number of undesirable characteristics. One of them is the occurrence of an unpleasant tacky sensation on the skin immediately after washing with the bar or cake containing the active sulfonate ingredient. The true reasons for the development of this tacky sensation have not been so far exactly determined and are, in fact, a subject of considerable conjecturing and debate. Nevertheless, the occurrence of this unpleasant feeling is to a large extent responsible for the lag in consumer acceptance of alkyl aryl sulfonate all-synthetic detergent bars and cakes in competition with conventional soap bars and cakes.

Another serious drawback which contributes to the reluctance of the consumers to accept these non-soap detergent bars or cakes is found in the tendency of these bars or cakes to undergo rapid erosion when left on the wet washstand, and, particularly, when the water draining off the detergent cake or bar after use remains in contact therewith owing to an incidental clogging of the drain hole or strainer in the dish or receptacle provided for the soap. As a general rule, in formulating solid sulfonate detergent bars or cakes, at least 20% by weight of an organic binder such as a starch or a vegetable gum is required to permit compacting the ingredients into a firm cohesive solid mass. These binder materials are hydrophilic colloidal compounds and on contact with water, even though it is present in comparatively small amounts, absorb it rather rapidly, soften up, and the bar breaks up and collapses as a smeary sludge in the soap dish. This annoying occurrence of erosion is somewhat less pronounced when the detergent formulation is compacted into an egg-shaped cake, as compared with rectangular bars; nevertheless, it contributes markedly to the slushing and rapid run-out of the bar or cake at the surface of

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contact with the soap-dish or washstand. In fact, it has been observed that the rate of erosion of sulfonate detergent bars as a general rule is from 1½ to 2 times faster than that of the conventional toilet soap.

Alkyl aryl sulfonate detergents, unless subjected to a special desalting treatment generally contain a substantial admixture of inorganic sulfate formed in the neutralization of the mixture of sulfonic acid and unreacted sulfuric acid, and a portion of this sulfate is present in the body of the detergent bar or cake as decahydrate. On drying after use and exposure to the atmosphere, dehydration occurs, and the bar or cake frosts, i. e., small crystals, or a coating of white dust of Na_2SO_4 , appear on the surface. The occurrence of this frosting is also objected to by the user.

Various approaches toward elimination of the aforementioned drawbacks in the preparation of all-synthetic sulfonate detergent bars and cakes for toilet and bath use have been suggested in the past. For instance, it has been proposed to introduce relatively large quantities of lecithin as a "detackifier" into the formulation. However, the quantities of lecithin effective in exerting the desired detackifying action are from 20 to 70% by weight of the total detergent formulation, and it is obvious that this technique introduces an unduly large amount of an ingredient which has nothing to do with the detergent action and tends to weaken it. In addition, the mixture containing so much lecithin, in the presence of water (up to 15% by weight) required to facilitate the preparation of satisfactory firm bars and cakes, tends to stick to the manufacturing equipment such as mills, plodders, etc. Furthermore, the presence of lecithin in a sulfonate detergent bar or cake does not reduce the rate of erosion thereof by water after use.

Another suggestion aiming at the reduction of the rate of erosion of sulfonate detergent bars and cakes involves introduction into the mass of the detergent bar of certain fillers such as china clay or talc so as to provide a sufficiently rigid, sponge-like network or skeleton of the filler material which, upon erosion of the water-sensitive sulfonate detergent and starch binder from the moistened surface, would become exposed, decreasing the points of contact between the water-sensitive ingredients and the wet receptacle for the bar and, consequently, would tend to decrease dissolution of the bar.

This proposal, however, is far from being a satisfactory solution of the problem of manufacturing a sulfonate detergent bar for toilet use. First of all, the employment of china clay or talc in the large proportions introduces an excess of extraneous inert material into the detergent bar or cake. Secondly, the mixture of ingredients (active sulfonate, detackifier such as lecithin, binder such as corn starch, etc.) containing clay or talc fillers is quite stiff and grainy, and to maintain sufficient fluidity of the mixture in the plodding, milling and molding equipment, it is necessary to increase considerably its lecithin content, introducing the drawback of stickiness to the parts of this equipment. Furthermore, the presence of an excess of filler such as talc weakens the cohesive strength of the final detergent bar or cake and renders it susceptible to crumbling, besides causing an untoward increase in the density of the bar or cake product. The surface of the resulting shaped product is not glossy and, notwithstanding the very careful selection of the finest grades of talc or clay, their presence imparts a somewhat gritty feeling to the skin in the process of washing.

The present invention provides a new "all-synthetic" alkyl aryl sulfonate detergent composition, shaped into bars, cakes or other forms suitable for toilet and bath use, as well as for household laundering, dishwashing and other washing applications where the use of solid

shaped detergent is appropriate and would be preferred by the consumer. When exposed to contact with water drained off into the soap holder of the washstand, the solid, shaped sulfonate bar or cake displays a moderate rate of erosion comparable and often lower than that of the better popular toilet soaps; furthermore, no tacky sensation obtains on the skin after these shaped solid compositions have been employed for washing or bathing.

The only active detergent ingredient in such a shaped product is an alkyl aryl sulfonate, preferably a sodium salt of C_9 to C_{18} monoalkyl benzene sulfonic acid and desirably a sodium salt of C_{12} - C_{15} monoalkyl benzene sulfonic acid. On account of the inherent stickiness of such sulfonates, these ingredients should not be present in the final shaped solid product in an amount greater than 50% by weight thereof, and in bars or cakes for toilet or bath use preferably in proportions from 30 to 40% by weight. When cakes or bars are to be used for laundering purposes, dishwashing, and generally in applications where the so-called heavy-duty laundry bar soaps containing substantial amounts of alkaline builders (such as tetrasodium pyrophosphate, sodium tripolyphosphates, sodium carbonate, sodium meta-silicate, and the like) have heretofore been used, the alkyl aryl sulfonate ingredients are present in amounts ranging from 15 to 30% by weight, and preferably from 20 to 25% by weight.

In addition to the alkyl aryl sulfonate detergent ingredient the solid shaped composition of the invention contains a non-frosting sodium salt of an inorganic acid, this salt being moderately soluble (preferably from about 2 to about 10%) in water at room temperature, and, furthermore, the composition contains a small amount of an alkaline earth metal salt or aluminum salt of a saturated C_{14} - C_{20} fatty acid. The non-frosting sodium salts of inorganic acids being moderately soluble in water tend to saturate the water present in the soap-dish after only a small amount has dissolved and thus prevent dissolution of the bar after being wetted. They are present in the detergent bar or cake in an amount ranging from 10 to 40% by weight thereof, preferably from 15 to 35% by weight. Sodium bicarbonate and tetrasodium pyrophosphate are particularly effective as anti-erosion ingredients of the solid, shaped detergent composition of this invention, because their solubility lies within the aforementioned range from 2 to 10%. On the other hand, sodium salts of inorganic acids having a higher rate of solubility, e. g., disodium hydrogen phosphate, have been found to be ineffective for the purpose of preventing rapid erosion, a bar containing 22% by weight of disodium hydrogen phosphate having collapsed completely in less than 24 hours of soaking in water.

The alkaline earth metal salts and aluminum salts of saturated C_{14} - C_{20} fatty acids are added to prevent the occurrence of the unpleasant tacky feeling on the skin after use. They are added in amounts which must be at least 1% of the total weight of the solid shaped composition, amounts ranging from 1 to 2% by weight generally being satisfactory for all practical purposes. The number of salts which can be so employed includes, e. g., calcium stearate, aluminum stearate, magnesium stearate, calcium myristate, aluminum palmitate, calcium laurate and magnesium laurate.

Ordinarily, the formulation of an all-synthetic detergent bar or cake prepared in accordance with the invention comprises an organic binder such as a starch or a vegetable gum. The presence of a binder, although not always necessary, is usually preferred, because it facilitates mixing of the ingredients and subsequent milling, plodding and stamping of the product, by acting as a plasticizer; in addition, the binder exerts a cohesive action in holding the ingredients together in the manufactured bar. From 10 to 30% by weight of such a binder and even as high as 40% by weight may be present in the composition. In most cases, however, from 10 to 25% of a starch such as corn starch, wheat starch,

potato starch, or the like, will adequately serve the manufacturing purposes.

An important requirement for the production of an effective satisfactory all-synthetic sulfonate detergent composition of the invention is a low content of sodium sulfate admixture in the active sulfonate ingredient. This content should be less than about 5% by weight based on the total weight of the solid shaped detergent composition. The sulfonate detergent employed in formulating the composition of the present invention may be produced by any of the well-known methods described in the art, the techniques described in U. S. Patent No. 2,477,383, issued to A. H. Lewis, being preferred.

When alkyl benzenes are sulfonated in accordance with the technique of the aforementioned patent by means of strong sulfuric acid, e. g., 22% oleum, the resulting sulfonic acid mix is diluted with water to 80% sulfuric acid strength in order to obtain a more complete separation of unreacted sulfuric acid from the sulfonic acid. The diluted mix is then neutralized with aqueous caustic soda or aqueous sodium carbonate and a sulfonate product slurry having a sodium sulfonate:sodium sulfate ratio of 85:15 to 88:12 is obtained.

In addition to the essential components mentioned hereinabove, a number of substances commonly employed in the preparation of soaps, and proposed in the past for the preparation of solid "mixed soap-synthetic detergent" and "all-synthetic detergent" bars and cakes, may be incorporated into the compositions prepared in accordance with the invention. Among these substances are included: fillers such as china clay and talc; plasticizers such as alkylol amines, e. g., triethanolamine, and water-soluble waxes, e. g., those known in the trade under the common name of "Carbowax"; pigments (e. g., titania and zinc oxide) and other coloring agents; antiseptics; perfumes; extenders (e. g., carboxymethyl cellulose), etc. If desired, these solid shaped compositions may also include effective amounts of N-alkyl glycine additives, such as are described by R. D. Stayner in his U. S. patent application Serial No. 343,257, as capable of preventing skin rashes and erythemas in persons allergic to sulfonates. Glycerine may also be added to improve lathering property and to impart the feeling of "slipperiness" characteristic of the better soaps. Except for the fillers such as talc and china clay which may be present in amounts up to 20% by weight of the total formulation, all other optional ingredients are employed in small amounts conventional in the soap manufacture, i. e., they are seldom present in the formulations in amounts exceeding 10% by weight thereof, and generally are present in amounts less than 5% by weight. The solid shaped compositions of the invention also contain a certain percentage of moisture, the presence of which facilitates the plodding and milling, and aids the plasticity of the bar or cake. This moisture or water content, as a rule, is lower than 15% by weight of the total formulation in bars intended for toilet and bath use, and not higher than 20% by weight in heavy-duty bars to be used in laundering and dishwashing.

The preparation of solid shaped all-synthetic sulfonate detergent compositions of the present invention follows the general lines of the conventional practice of manufacturing milled toilet soaps. The several solid and liquid ingredients are mixed together in an amalgamator, and the resulting loose mixture containing less than 15% by weight of moisture is fed into a plodder. After passing the mixture several times through the plodder (or a series of plodders), the extruded material which emerges from the plodder in the form of a continuous cylinder about 1½ inches in diameter is cut into lengths and these are stamped in a mold. If a finer product of a texture resembling that of the better milled toilet soaps is desired, the mixture of ingredients leaving the amalgamator is subjected to milling in a suitable soap mill before being introduced into the plodder, and then is fed into the

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plodding and stamping equipment. The whole operation can be effected at room temperature. If difficulties develop, owing to the materials sticking to the mold, it may be dusted with talcum, or mold-release fluids, e. g., glycerine-brine, may be employed in conventional manner.

A number of examples are offered hereinafter to indicate the problems involved in the preparation and application of all-synthetic sulfonate detergent cakes and bars for toilet use and to show that these problems are decreased and eliminated by the preparation of the shaped solid detergent products of the present invention. In these examples the amounts are given in percent by weight. The sulfonate detergent employed is sodium C_{12} - C_{15} polypropylene benzene sulfonate prepared in accordance with the aforementioned U. S. Patent No. 2,477,383, issued to A. H. Lewis. The starch binder, whenever employed, is corn starch. In some of the examples water-soluble high molecular wax is present as a plasticizer; this wax is a polyglycol product of a molecular weight of about 1,540, manufactured by the Carbide & Carbon Chemicals Division of New York, New York, under the trade-name "Carbowax 1540." The amount of moisture present in the various mixtures of ingredients were as high as 10%, amounts from 6 to 8% having been found to furnish the optimum results insofar as the efficiency of manufacturing and the quality of the final bar or cake is concerned. The solid shaped products prepared in the laboratory in accordance with the general procedure outlined hereinabove and described in the examples had the following dimensions: length, $2\frac{3}{4}$ "; width, $2\frac{1}{8}$ "; thickness, about 1".

The rate of erosion was determined by placing the finished bar or cake into a beaker containing 200 cc. of cold distilled water and letting it soak at room temperature for two days, whereupon the fluidized matter was sloughed off, and the percentage (rate) of erosion determined by weighing the undissolved remainder of the bar or cake and computing the ratio of the liquefied material to the original weight of the bar.

The frosting tendency was estimated visually by permitting the toilet bar to dry after use and observing its surface after 24 hours. Frosting was rated as "heavy," "moderate," and "slight."

The sensation of stickiness on the skin after use was determined by washing the hands with the sulfonate bar, drying them thoroughly, and then clenching the fist repeatedly. Again, the ratings assigned were "heavy," "moderate," and "slight."

Lathering power and detergency of the bar and cakes prepared in accordance with the invention were compared visually with the lathering power and detergency of three different bars of good-quality mixed tallow and coconut oil soap.

The following four examples illustrate the increase of objectionable frosting with an increasing content of sodium sulfate in the bar, faced in the past by the formulators of sulfonate detergent bars:

Example 1

The bar in this example was substantially free of sodium sulfate and had the following composition:

	Percent
Active sulfonate	50
Corn starch	20
Talc	20
Carbowax	2
Water	7
Zinc oxide	1

Since this bar does not contain sodium sulfate, no frosting could be observed, although the sensation of stickiness on the skin after washing was quite pronounced and thus rated as heavy. The bar was soft and ivory in color.

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Example 2

This bar had the following composition:

	Percent
Active sulfonate	47.5
Sodium sulfate	2.5
Corn starch	20
Talc	20
Carbowax	2
Water	7
Zinc oxide	1

No frosting was observed 24 hours after being used, but a moderate degree of stickiness was felt on the hands after use.

Example 3

This bar had a higher content of sodium sulfate than the one in Example 2, being of the following composition:

	Percent
Active sulfonate	45
Sodium sulfate	5
Corn starch	20
Talc	20
Carbowax	2
Water	7
Zinc oxide	1

A slight degree of frosting was observed 24 hours after being used; the sensation of stickiness on the hands was of about the same order as in Example 2.

Example 4

This bar had an even greater content of sodium sulfate than the bars in the two preceding examples. Its sulfonate content was 40% and its sodium sulfate content was 10%, the amounts of other ingredients were the same as in Examples 2 and 3. Frosting observed 24 hours after use was heavy, while the feeling of stickiness was of the same order as in Examples 2, and 3. The bars in each of Examples 2, 3 and 4 were of a firm texture and white in color. The surface, glossy upon preparation, became dull after use.

The next six examples are offered to show the effect of various additives on the occurrence of the sensation of stickiness on the skin after washing: of triethanolamine, in Example 8; of lecithin, in Example 9; and, particularly, of alkaline earth metal salts and aluminum salts of saturated C_{14} - C_{20} fatty acids, in Examples 5, 6 and 7. Example 10 is given to show that the employment of a starch binder is optional, and that starch may be omitted, the active sulfonate itself providing a sufficient degree of cohesiveness. Example 11 is given to show that the presence of an inert filler (talc) is likewise not critical for the preparation of a firm bar.

Example 5

This bar had the following composition:

	Percent
Active sulfonate	30
Sodium sulfate	20
Corn starch	20
Talc	20
Carbowax	2
Water	7
Calcium stearate	1

The bar frosted heavily 24 hours after being used, but the feeling of stickiness was very slight. This bar had a firm texture and was ivory in color. The originally glossy surface became somewhat dull after use.

Example 6

This bar was of a practically identical composition as that of Example 5, except that calcium stearate was replaced by an equivalent amount of aluminum stearate. Frosting was noted to be heavy, but stickiness after use was very slight. The bar was firm, quite glossy at first, and ivory in color.

Example 7

This bar had the same composition as that of Example 5, except for the content of calcium stearate which was increased to 2% by weight at the expense of the moisture content reduced to 6%. Frosting continued to be heavy, but the feeling of stickiness was exceedingly slight. The original texture of the bar remained firm. Its color was light ivory.

Example 8

The composition of this bar was as follows:

	Percent
Active sulfonate	30
Sodium sulfate	20
Corn starch	20
Talc	20
Carbowax	2
Water	4
Triethanolamine	4

Frosting was moderate, possibly as a result of the presence of triethanolamine plasticizer, but the sensation of stickiness after use was much more pronounced than in Examples 5, 6 and 7, and was rated as moderate. In addition, the bar, even though possessing a satisfactory ivory color, had too soft a texture.

Example 9

This bar had the following composition:

	Percent
Active sulfonate	30
Sodium sulfate	20
Corn starch	20
Talc	18
Carbowax	2
Water	8
Lecithin	2

This bar, after having been used and left to dry for 24 hours, frosted heavily and produced a moderate sensation of stickiness on the hands after washing.

Addition of lanolin, olive oil, stearic acid, sodium benzoate and casein in amounts which ranged from 2 to 10% by weight of the total composition, in lieu of lecithin of Example 9 above, were found to be likewise ineffective for the purpose of reducing the sensation of stickiness on the hands after use.

Example 10

The bar had the following composition:

	Percent
Active sulfonate	44.0
Sodium sulfate	29
Talc	20
Carbowax	2
Water	5

Frosting observed 24 hours after use was heavy, and a moderate degree of stickiness was felt on the hands after washing.

Example 11

The bar had the following composition:

	Percent
Active sulfonate	48
Corn starch	40
Water	10
Calcium stearate	2

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No frosting appeared 24 hours after use, and the feeling of stickiness after washing the hands was very slight. When tested for 48 hours for erosion tendency, the bar was found to be 79.6% by weight eroded. The absence of talcum in this composition seems to have no adverse effect on the formation of a firm bar having a smooth, glossy surface and ivory in color.

Examples 13, 14 and 15 bring forward the several advantageous features of the solid shaped detergent compositions of the present invention obtained by bringing together the essential ingredients thereof in the proportions hereinbefore specified, as compared with Example 12 of an all-synthetic sulfonate bar which did not contain the ameliorative ingredients and with Example 16 in which conventional toilet soaps were employed.

Example 12

This bar had the following composition:

	Percent
Active sulfonate	32.3
Sodium sulfate	21.7
Corn starch	20
Talc	20
Water	6

It frosted heavily 24 hours after use and imparted a moderate feeling of stickiness to the hands upon washing. When tested 48 hours for erosion tendency, it was found to be 100% eroded, although when manufactured this bar was firm and possessed a satisfactory glossy surface of a darker shade of ivory color.

Example 13

The composition of this bar was as follows:

	Percent
Active sulfonate	39.7
Sodium sulfate	5.9
Sodium bicarbonate	22.7
Corn starch	22.7
Water	9

The presence of sodium bicarbonate in the amount within the operative range from 10 to 40% by weight of the total composition reduced erosion to 34.7%. A slight degree of frosting appeared 24 hours after use, owing to the sodium sulfate content being slightly higher than the permissible maximum. The bar lathered well in either soft (50 p. p. m. of combined Mg-Ca hardness) or hard water (200 p. p. m. of Mg-Ca hardness) and had a good washing action.

Example 14

The bar in this example had the following composition:

	Percent
Active sulfonate	31.5
Sodium sulfate	4.7
Sodium bicarbonate	16.5
Corn starch	40
Water	6.3
Aluminum stearate	1

This composition included sodium bicarbonate as the erosion-reducing additive and aluminum stearate as the stickiness inhibitor. After washing the hands with the bar, practically no sticky sensation was felt on the skin. Frosting was substantially absent. The results of the 48-hour determination of erosion tendency gave a rate of erosion of a mere 32.7%. The surface of the bar was glossy, its texture was firm, and the color was light yellow.

Detergency and lathering were comparable to those of good-quality soaps.

Example 15

This composition included tetrasodium pyrophosphate as the erosion-reducing additive and calcium stearate as the stickiness inhibitor. The formulation contained:

	Percent
Active sulfonate	30.8
Sodium sulfate	4.6
Tetrasodium pyrophosphate	36.8
Corn starch	20.6
Water	6.2
Calcium stearate	1

Frosting was substantially absent. The stickiness sensation after washing was practically absent, and the 48-hour determination of the erosion tendency gave a value of a mere 37.1%. The bar had a firm texture with a rather dull surface and was light brown in color. Detergency and lathering were comparable to those of good-quality soaps.

Example 16.—Control test with three different soaps

In this example three cakes of different good-quality, popular brands of mixed tallow and coconut oil toilet soap were tested to determine their rate of erosion. Soap A, which contained 5% of moisture, had an erosion rate of 44.9%; soap B, which likewise contained 5% of moisture, had an erosion rate of 39.5%; soap C, which had a moisture content of 9.5% displayed an erosion rate of 44.5%. Frosting and sensation of stickiness were obviously non-existent.

Example 17

The bar tested in this example had the following composition:

	Percent
Active sulfonate	25
Sodium sulfate	3.5
Tetrasodium pyrophosphate	25
Corn starch	25
Sodium carboxymethyl cellulose	1.2
Water	19.3
Calcium stearate	1.0

The bar was light brown in color and had a rather soft texture owing to the high content of moisture. After being used and left to dry for 24 hours, this laundry-type sulfonate detergent bar showed about the same rate of erosion as the sulfonate toilet bar of Example 15. The sensation of stickiness after use on the skin was slight. Detergency and lathering were of the same order as those of conventional-cast laundry soap bars.

Example 18

In this example, a laundry type "all-synthetic" detergent bar, milled in the same manner as described hereinabove, had the following composition:

	Percent
Active sulfonate	20
Sodium sulfate	3.0
Tetrasodium pyrophosphate	30.5
Corn starch	30.5
Calcium stearate	1.0
Water	15.0

This bar was likewise light brown in color, but had a firmer texture upon being used and left in the soap-dish for 24 hours; it showed a rate of erosion of the order of 35%. Stickiness sensation on the skin after use was practically nil. Detergency and lathering were of the same order as in the preceding example.

The foregoing examples establish beyond doubt the advantages of the all-synthetic sulfonate detergent solid shaped compositions of the present invention. The practical absence of the sensation of stickiness on the hands after use, and the low rate of erosion, equivalent to and often lower than that of the better brands of toilet soaps, make these useful all-synthetic products attractive to the consumers in competition with conventional-milled toilet soaps and cast-laundry soap bars.

This application is a continuation-in-part of my co-pending application Ser. No. 383,403, filed in the United States Patent Office on September 30, 1953, and now abandoned.

It is to be understood that applicant does not limit himself to the specific examples, given hereinabove merely to illustrate his invention, except as set forth in the following claims.

I claim:

1. A solid shaped synthetic detergent composition which comprises as its essential components: (1) a sodium C_{12} - C_{15} monoalkyl benzene sulfonate; (2) a non-frosting sodium salt of an inorganic acid selected from the group consisting of sodium bicarbonate and tetrasodium pyrophosphate; (3) a salt selected from the group consisting of alkaline earth metal and aluminum salts of saturated C_{14} - C_{20} fatty acids; (4) a starch binder; (5) sodium sulfate in an amount ranging from 0 to less than 5% of the total weight of said five components, the proportions by weight of said components (1), (2), (3) and (4) on the basis of the total weight of 100 parts of said five components lying within the following ranges:

Component:	Parts
1. Sulfonate	30 to 50
2. Non-frosting salt of inorganic acid	10 to 40
3. Salt of saturated fatty acid	1 to 2
4. Starch	10 to 40

said composition containing not more than 20 parts of water per 100 parts of the total weight of said five components.

2. A solid shaped synthetic detergent composition for toilet and bath use consisting essentially, in parts by weight, of (1) to make 100 parts: 15 to 50 parts of sodium C_9 - C_{18} monoalkyl benzene sulfonate, 0 to 5 parts sodium sulfate, 10 to 40 parts of an inorganic salt selected from the group consisting of sodium bicarbonate and tetrasodium pyrophosphate, 1 to 2 parts of a salt of a saturated C_{14} - C_{20} fatty acid and a metal selected from the group consisting of aluminum and alkaline earth metals; and (2) about 6 to 20 parts water.

3. Composition according to claim 2 wherein the alkaline earth metal of the saturated fatty acid salt is calcium stearate.

4. Composition according to claim 2, wherein the sodium C_9 - C_{18} monoalkyl benzene sulfonate is present in an amount of 20 to 30 parts.

5. Composition according to claim 2 wherein the sodium C_9 - C_{18} monoalkyl benzene sulfonate is present in an amount about 30 to 50 parts.

6. Composition according to claim 5 wherein the sodium monoalkyl benzene sulfonate is a sodium C_{12} - C_{15} monoalkyl benzene sulfonate.

7. Composition according to claim 5 wherein the inorganic salt selected from the group consisting of sodium bicarbonate and tetrasodium pyrophosphate is present in an amount of 15 to 35 parts.

8. Composition according to claim 7 wherein the monoalkyl benzene sulfonate is present in an amount of 30 to 40 parts.

9. A solid shaped synthetic detergent composition for toilet and bath use consisting essentially, in parts by weight, of (1) to make 100 parts: 30 to 50 parts of so-

dium C_{12} - C_{15} monoalkyl benzene sulfonate, 0 to 5 parts of sodium sulfate, 15 to 35 parts of an inorganic salt selected from the group consisting of sodium bicarbonate and tetrasodium pyrophosphate, 1 to 2 parts of a salt of a saturated C_{14} - C_{20} fatty acid and a metal selected from the group consisting of aluminum and alkaline earth metals, 10 to 30 parts of a starch binder; and (2) about 6 to 20 parts of water.

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