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CLEANSING COMPOSITION IN DRY
GRANULAR FORMLyman D. Dunn, 603 Addison St., Chicago, Ill.
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This invention relates principally to a dry stable homogeneous cleansing and detergent composition of a powdered or granulated aspect as in a most advantageous and commercial state to render the same adaptable for use in conventional dispensing appliances and devices as commonly installed in public lavatories and the like, as for hand washing service. Some types of dispensing apparatus are regulatable to dispense different quantities. The type of dispensing apparatus, however, is optional.

This application is a continuation-in-part of my copending application, filed on August 19, 1955, as Serial Number 529,589, and now abandoned, which application was a continuation-in-part and was copending with my application filed on December 3, 1953, as Serial Number 396,065, now abandoned.

The present invention is principally directed to a cleanser or detergent in a powdered or granulated state in which borax is a primary ingredient combined with soap.

Borax is termed as sodium tetraborate decahydrate. It is given a chemical formula $\text{Na}_2\text{B}_4\text{O}_7(10\text{H}_2\text{O})$. Decahydrate is described as a substance containing ten molecules of water. Borax is usually a dry crystalline product, and is included in a cleanser composition for the scrubbing action which it provides. Basically a powdered soap of the type here involved is employed principally in washrooms and the like as a hand soap, and thus must include in its composition a cleansing agent, such as soap, and also a scrubbing agent. Borax is often used for this purpose, as it is slowly but completely soluble in water, and because it has a slight soft-

tening effect on the water. Therefore, it has been common practice to use a mixture of borax and a sodium soap to form a powdered hand soap composition. The difficulty with such a mixture, however, is that it will not readily form suds, and the mixture when wetted has a slimy appearance and feel. I have discovered that the addition of a minor proportion of a potassium soap of a short chain fatty acid to a borax and sodium soap cleanser will produce a compound which will form suds instantly when wetted, and thus provides a cleansing compound far more pleasant and attractive to use.

An object of the invention is to produce a pulverized or powdered cleansing product or detergent consisting of soap, combined with a percentage or proportion of borax to produce a crystalline, dry cleansing or detergent composition.

Another object of the invention is to combine a potassium soft soap with sodium tetraborate in relative proportions which, when mixed with sodium soap, will produce a homogeneous dry cleansing or detergent compound. The liquid present in the potassium soap is ab-

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sorbed by the crystal structure of the sodium tetraborate so that the product exhibits a dry appearance.

Another object of the invention relates to a cleanser or detergent, preferably in a powdered or granular state which is capable of forming suds even though borax is a primary ingredient.

The invention is primarily directed to a dry product as a powdered or pulverized cleanser or detergent composed of borax, a sodium soap and a potassium soap of a short chain fatty acid.

Sodium soaps such as are useful in this invention are commonly used the world over. These sodium soaps are commonly defined as the sodium salt of the strong base sodium hydroxide and a long chain fatty acid. For example, sodium hydroxide is commonly reacted with such natural fatty acids as beef tallow, corn oil, soya oil, and peanut oil. These oils are commonly referred to in the industry as long chain fatty acids because the molecule contains a larger number of carbon atoms than are commonly present in most other natural oils.

The potassium soaps of short chain fatty acids such as are useful in this invention are also salts of a strong base such as potassium hydroxide and a fatty acid. However, in this case the fatty acid is of the short chain variety. For example, such naturally existing oils as cocoanut oil, palm kernel oil and babassu oil may be used. For the purposes of this invention it is preferable that the potassium cocoanut oil soap be used. It is also possible to use substantially pure refined fatty acids such as lauric and myristic acids in making the potassium soaps of this invention.

Since the above described soaps are made by reacting bases with naturally existing fats, it is of course difficult to exactly determine the chemical composition of the oils. However, the following table sets forth an average percentage composition of these oils. In each case, of course, there will be other varying components which are classified as "others."

Fatty Acids	Cocoanut Oil, percent	Palm Kernel Oil, percent	Babassu Oil, percent	Beef Tallow, percent	Corn Oil, percent	Soya Oil, percent	Peanut Oil, percent
Caprylic, C_8	8	4	4				
Capric, C_{10}	7	5	7				
Lauric, C_{12}	48	50	45				
Myristic, C_{14}	17	15	17	3			
Palmitic, C_{16}	9	7	7	29	8	8	7
Stearic, C_{18}	2	2	4	20	3.5	4	4
Oleic, C_{18}	6	15	14	42	46	28	60
Linoleic, C_{18}	2	1		2	42	54	22
Others	1	1	2	4	.5	6	7

It is apparent from the above table that the cocoanut oil, palm kernel oil, and babassu oil, contain a major proportion of the short chain fatty acids and that the beef tallow, corn oil, soya oil, and peanut oil contain a major proportion of the longer chain fatty acids.

In compounding the sodium soaps of this invention it is of course customary to include minor proportions of other components. For example, two soaps which have proved satisfactory for the purposes of this invention are soap R and soap F. These two soaps when analyzed gave the following analysis:

	Soap R, percent	Soap F, percent
Anhydrous soap content	94.0	92.0
Moisture	4.0	3.8
Sodium carbonate	.4	.4
Sodium silicate	.3	2.4
Sodium chloride	.6	.6
Glycerine	.7	.8
Total	100.0	100.0

An analysis of the anhydrous soap content given in the above soaps gave the following percentages:

	Soap R, percent	Soap F, percent
Fatty anhydride.....	83.87	82.49
Combined alkali as Na ₂ O.....	10.13	9.51
	94.00	92.00

In soap R the fatty anhydride used was beef tallow. In soap F the fatty anhydride used was soya oil. Of course, the fatty anhydride could be any one of the other long chain fatty acids, examples of which have already been given.

Of the potassium short chain fatty acid soap, it is preferable that it contain about 60% soap and about 40% liquid. Such a type of soap is commonly referred to as a soft soap. An important factor of this invention is that when the borax-potassium soap mixture is mixed with the sodium soaps, the sodium soaps will suds in spite of the high percentage of borax, and therefore it may be said that it is the small percent of potassium soap combined with the borax that appears in some manner to prevent or overcome or suppress the salting-out action of the borax and enables accomplishing a satisfactory result. The water or fluid portion of the soft potassium soap is absorbed into the crystal structure of the borax, thus resulting in a comparatively dry effect. Thus, the potassium soap may be characterized as a soft soap of the character to be absorbed into the crystal structure of the borax.

The proportions of the various components to be used in this invention are as follows, based on the anhydrous weight of the components:

Borax—From about 71 to 87 parts by weight, with about 74 to 81 parts being preferred, and with about 80 parts being most preferred.

Sodium soap—From about 12 to 25 parts by weight, with about 15 to 20 parts being preferred, and with about 16.5 parts being most preferred.

Potassium soap—From about 1 to 6 parts by weight, with about 3 to 6 parts being preferred, and with about 4 parts being most preferred.

The clarification of the method and product of this invention will result from the following examples:

Example I

To an intensive type mixer (a mixer having a mortar and pestle type action) was added 80 pounds of powdered borax, and 6.6 pounds of potassium cocoanut oil soap containing 60% solids and 40% liquid. These two ingredients were then thoroughly mixed until the water present in the commercial potassium cocoanut oil soap was absorbed by the borax, which was done in about five minutes. To this mixture 16½ pounds of powdered sodium soap conforming generally to the analysis given in soap R above was added and the mixing continued until all of the ingredients were thoroughly blended. The entire mixing cycle took about thirteen minutes, at which time the product assumed a dry granular form which was completely flowable.

Example II

The following amounts of components were added and mixed in the same manner as given in Example I:

Powdered borax—80 pounds

Powdered sodium soap conforming generally to the analysis given for soap R above—15 pounds

Potassium cocoanut oil soap containing 60% anhydrous solids—5 pounds

Example III

The following amounts of components were added and mixed in the same manner as given in Example I:

5 Powdered borax—74 pounds

Powdered sodium soap conforming generally to the analysis given for soap F above—20 pounds

Potassium cocoanut oil soap containing 60% anhydrous solids—6 pounds

10 It has been previously indicated that pulverulent hand soaps have previously been made which included only the borax and sodium soap. Such mixtures are not homogeneous, regardless of the amount of mixing which has occurred, and streaks of yellow (sodium soap) can readily be detected against the white background of borax. This tendency for the mixture to striate apparently is inherent in sodium soap-borax mixtures.

15 In forming the present cleansing compound, however, it was noted that the resulting mixture is completely homogeneous in appearance, even though the major portions thereof are borax and sodium soap. There is no tendency on the part of the mixture to striate, and the final product has a smooth, even texture and appearance, which not only is more pleasing to the eye, but possesses improved flow qualities, and thus is more susceptible to dispensing in the normal soap dispensers found in lavatories.

20 Having described my invention as related to certain embodiments thereof, it is my intention that the invention be not limited by any of the details of description unless otherwise specified, but rather be construed broadly within its spirit and scope as set out in the accompanying claims.

I claim:

35 1. A dry, pulverulent cleansing composition capable of sudsing, which composition has been produced by mixing together until dry approximately 71 to 87 parts by dry weight of borax and approximately 1 to 6 parts by dry weight of a potassium soft soap containing by weight of said soap up to about 40% water, said soft soap being a potassium soap of a short chain fatty acid comprising a mixture containing at least about 70% of fatty acid having from 8 to 14 carbon atoms of which at least about 60% has from 12 to 14 carbon atoms, thereafter adding approximately 12 to 25 parts by dry weight of a sodium soap of a long chain fatty acid comprising a mixture containing at least about 90% of fatty acid having from 16 to 18 carbon atoms, and mixing said borax-potassium soap mixture and said sodium soap together to produce a product in a dry granular form.

50 2. The cleansing composition of claim 1 wherein said potassium soap of a short chain fatty acid is a member of the class consisting of potassium cocoanut oil soap, potassium palm kernel oil soap, and potassium babassu oil soap.

55 3. The cleansing composition of claim 1 wherein said potassium soap of a short chain fatty acid is potassium cocoanut oil soap.

60 4. A dry, pulverulent cleansing composition capable of sudsing, which composition has been produced by mixing together until dry approximately 74 to 81 parts by dry weight of borax and approximately 3 to 6 parts by dry weight of a potassium soft soap containing by weight of said soap up to about 40% water, said soft soap being a potassium soap of a short chain fatty acid comprising a mixture containing at least about 70% of fatty acid having from 8 to 14 carbon atoms of which at least about 60% has from 12 to 14 carbon atoms, thereafter adding approximately 15 to 20 parts by dry weight of a sodium soap of a long chain fatty acid comprising a mixture of at least about 90% of fatty acid having from 16 to 18 carbon atoms, and mixing said borax-potassium soap mixture and said sodium soap together to produce in a dry granular form.

75 5. A dry, pulverulent cleansing composition capable

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of sudsing, which composition has been produced by mixing together until dry approximately 80 parts by dry weight of borax and approximately 4 parts by dry weight of a potassium soft soap containing by weight of said soap about 60% solids and about 40% water, said soft soap being a potassium soap of a short chain fatty acid comprising a mixture containing at least about 70% of fatty acid having from 8 to 14 carbon atoms of which at least about 60% has from 12 to 14 carbon atoms, thereafter adding approximately 16.5 parts by dry weight of a sodium soap of a long chain fatty acid comprising a mixture containing at least about 90% of fatty acid having from 16 to 18 carbon atoms, and mixing said borax-potassium soap mixture and said sodium soap together to produce a product in a dry granular form.

6. A method for providing a dry, pulverulent cleansing composition capable of sudsing, comprising the steps of: mixing together until dry approximately 71 to 87 parts by dry weight of borax and approximately 1 to 6 parts by dry weight of a potassium soft soap containing by weight of said soap up to about 40% water, said soft soap being a potassium soap of a short chain fatty acid comprising a mixture containing at least about 70% of fatty acid having from 8 to 14 carbon atoms of which at least about 60% has from 12 to 14 carbon atoms, thereafter adding approximately 12 to 25 parts by dry weight of a sodium soap of a long chain fatty acid comprising a mixture containing at least about 90% of fatty acid having from 16 to 18 carbon atoms, and mixing said borax-potassium soap mixture and said sodium soap together to produce a product in a dry granular form.

7. A method for providing a dry, pulverulent cleansing composition capable of sudsing, comprising the steps of: mixing together until dry approximately 74 to 81 parts by dry weight of borax and approximately 3 to 6 parts by dry weight of a potassium soft soap containing by weight of said soap up to about 40% water, said soft soap being a potassium soap of a short chain fatty acid comprising a mixture containing at least about 70% of fatty acid having from 8 to 14 carbon atoms of which at least about 60% has from 12 to 14 carbon atoms, there-

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after adding approximately 15 to 20 parts by dry weight of a sodium soap of a long chain fatty acid comprising a mixture containing at least about 90% of fatty acid having from 16 to 18 carbon atoms, and mixing said borax-potassium soap mixture and said sodium soap together to produce a product in a dry granular form.

8. A method for providing a dry, pulverulent cleansing composition capable of sudsing, comprising the steps of: mixing together until dry approximately 80 parts by dry weight of borax and approximately 4 parts by dry weight of a potassium soft soap containing by weight of said soap about 60% solids and about 40% water, said soft soap being a potassium soap of a short chain fatty acid comprising a mixture containing at least about 70% of fatty acid having from 8 to 14 carbon atoms of which at least about 60% has from 12 to 14 carbon atoms, thereafter adding approximately 16.5 parts by dry weight of a sodium soap of a long chain fatty acid comprising a mixture containing at least about 90% of fatty acid having from 16 to 18 carbon atoms, and mixing said borax-potassium soap mixture and said sodium soap together to produce a product in a dry granular form.

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