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(71) Applicant: **MIRA LANZA S.P.A.**
Via Lampedusa 11/A
I-20141 Milano(IT)

(72) Inventor: **Franzolin, Giorgio**
3, Largo S. Luca
I-30034 Mira, Venezia(IT)
Inventor: **Cordellina, Antonio**
126, Via Santuario S.M.
I-35031 Abano Terme, Padova(IT)
Inventor: **Savino, Vito**
45/7, Corso Firenze
I-16122 Genova(IT)

(74) Representative: **Porsia, Attilio, Dr. et al**
c/o Succ. Ing. Fischetti & Weber Via Caffaro 3/2
I-16124 Genova(IT)

(54) Powdered detergent having a high content of nonionic surfactants and soaps.

(57) Composition of powdered detergent for washing machines having a system of surfactants of the ternary type, i.e. nonionic surfactants, anionic surfactants of the synthetic type and soaps. Said nonionic surfactants are present in a high percentage, 5% to 16% in the composition of the detergent, and said soaps are present in 0,5% to 8% percentages. According to a main characteristic of the invention, soaps are added successively into the basic powder which has been obtained by atomization. Advantageously, said soaps are added in the form of thin scales of small dimensions.

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This invention relates to powdered detergents for washing machines, and more particularly to the powdered detergents for washing machines, having a high content of nonionic surfactants. These detergents, actually, have a better cleansing capacity against dirt of the fatty type, and particularly for washing at low temperature.

Usually, detergents for washing machines utilize mixtures of surfactants which have beside a good cleansing power also a good foam-control capacity during washing and rinsing.

The foam-control is necessary to avoid that foam, by escaping out of the drum, may damage the washing machine. Moreover, the excess of foam hinders the mechanical flapping of linen within the washing machines, thus reducing the cleansing action of the detergent.

Qualitatively, use is made of anionic surfactants of the sulfonate/sulfate type such as LAS, AS, nonionic surfactants such as natural or synthetic polycondensed alcohols with ethylene/propylene oxide and soaps derived from fatty acids substantially of natural origin, of varied compositions and as a mixture, such as fatty acids from tallow, coconut, fish, colza, etc.

Examples of mixtures from said surfactants which are suitable as to foam-control during washing and rinsing, may be:

Surfactant	I	II	III	IV
LAS + AS	5	7	6	8
NONIONIC	2	4	6	3
SOAP	3	3	3	5

During the washing process, soap reacts with the hardness salts of the water to form calcium and magnesium salts, which tend to control the foam during the entire washing cycle, particularly at high temperatures, and even in the rinsing step. The control of foam can also be effected, as a partial alternative to soap, by using antifoaming substances or systems, such as silicones and waxes. The use of the above antifoaming substances can be effective in the washing step, but not as much effective in the rinsing step; therefore, the use of a certain amount of soap is preferred.

Moreover, the antifoaming systems based on silicone/wax shown to be more expensive than soap at a parity of results.

In the currently-used detergents, the surfactants discussed above are processed together: an aqueous slurry is formed of surfactants, builders, alkalizing, anti-redeposing, stabilizing, optical bleaching materials, etc.; successively said slurry is dried by atomization in a hot air stream, by using plants usually called spray-driers, thus obtaining a granulated powder which, mixed with other components which are usually heat-labile and, therefore, unfit for hot-processing, originates the final detergent.

The present trend is to reduce the maximum washing temperature: this is a direct function of the greater diffusion of synthetic fibres and colored fabrics.

In order to assure effective performances in low-temperature washing, the composition of detergents must be modified.

More particularly, as far as surfactants are concerned, the convenience is emphasized to use nonionic surfactants having low ethylene oxide content and low HLB, and in amounts higher than usual.

These nonionic surfactants are liquid at room temperature and are more volatile (high vapor tension).

It is not convenient to process these nonionic surfactants in the slurry, as discussed above, because the drying temperatures should be drastically reduced and, therefore, the production capacity of the installation would be reduced.

Therefore, said types of nonionic surfactants must be added into the product which has been already dried together with the heat-labile components.

By operating according to these terms, the quality of the product is not satisfactory: the final product is greasy to the touch, is not flowable, and is packageable with difficulty.

The tests which have been effected have shown that this characteristic is due to the soap contained in the atomized detergent, which makes the complete adsorption of the liquid nonionic surfactant into the atomized powder difficult. By either reducing the amount of soap in the atomized product or by eliminating it, the adsorption of the nonionic surfactant is increased and the flowability of the detergent becomes optimized.

These data are shown in the following examples of detergent compositions.

Components	I	II	III
LAS in slurry	7	9	11
SOAP in slurry	4	2	0
Nonionics in post addition	8	8	8
Flowability	insuff.	suff.	optimum

The reduction or the elimination of soap from the atomized detergent, if not associated with other modifications of formulation, yields a product having an insufficient control of foaming during the use in a washing machine.

Usually, to solve this problem, use is made of synthetic materials having antifoaming properties, such as silicones and waxes.

According to the present inventions, we have discovered, quite surprisingly, that soap may be used in detergents even in large percentage amounts, in combination with large amounts of nonionic surfactants added in "post addition", without incurring in the above-mentioned disadvantages of the known detergents produced according to the present state of the art.

In fact, according to the invention, we have found out that the amount of soap in the slurry containing the other surfactants, may be either eliminated or drastically reduced, with resulting advantages also from the standpoint of the slurry atomization, thereafter adding it by dry-mixing with the heat-labile components into the atomized detergent.

By operating this way, the advantages are obtained of an adequate foam control, without resorting to silicone derivatives or to waxes, and at the same time a good flowability of the detergent is obtained, even in the presence of large amounts of nonionic surfactants.

Stated otherwise, the manner according to the invention of incorporating soap into the detergent does not hinder the adsorption capacity of nonionic surfactants, thus enabling the production of flowable detergents containing high concentrations of nonionic surfactants which are liquid at room temperature.

The use of soap in the manner set forth by the present invention is more convenient with respect to the silicone derivatives and waxes, both for economic and performance reasons: in fact, soap usually controls better than silicones the level of foam during the rinsing steps in a washing machine.

Soap which is used for dry-mixing into detergents according to the invention may have different physical forms: powder, granules, scales or the like. Usually, it is added in percentages of 0.5 to 8% b.w. based on the weight of the final product.

The weight ratio between soap and nonionic surfactants in the final product may range according to the invention between 10:1 and 2:1, with a content of nonionic surfactants in the final product ranging from 5 to 16% b.w.

To improve the dissolving rate, which should be as high as possible, we have found that the use of soap in the form of thin scales is the most convenient.

The typical characteristics of the scales of soap suitable for the objective of the invention are shown below:

Size	2 to 5 mm
Thickness	0.2 to 0.4 mm
Soap	70 - 90
Stabilizer + additives + water	balance to 100

Claims

1. A composition of powdered detergent of the type comprising nonionic surfactants, anionic surfactants of the synthetic type and soaps, wherein the content of nonionic surfactant is particularly high with respect to the content of soap, characterized in that the basic powder which is obtained by atomization contains no soap or a very low percentage of soap, said soap being added posteriorly by dry-mixing with said basic powder.

2. A composition according to claim 1, characterized in that it contains 0.5% to 8% of soap added

posteriorly.

3. A composition according to claim 1, characterized in that it contains 5% to 16% of a nonionic surfactant having a melting point lower than $+30^{\circ}$ C.

4. A composition according to claims 1 to 3, characterized by the fact that the weight ratio

$$\frac{\text{nonionic surfactants}}{\text{soap}}$$

is comprised in the range between 10:1 and 2:1.

5. A composition according to claim 3, characterized in that said nonionic surfactant is added posteriorly to the detergent basic powder.

6. A composition according to the preceding claims, wherein said posteriorly-added soap is in the physical form of thin scales having the dimensions of 1 to 10 mm.

7. A composition according to claims 1 to 5, wherein said soap added posteriorly is in the physical form of granules having the dimensions of 0.2 to 3 mm.

8. A composition according to claims 1 to 5, wherein said soap added posteriorly is in the physical form of atomized powder.

9. A composition according to any one of claims 1 to 8, wherein the soap is colored with soluble dyes or pigments.

10. A method of manufacturing a composition of powdered detergent comprising nonionic surfactants, anionic surfactants of the synthetic type and soaps, wherein the content of nonionic surfactants is particularly high with respect to the content of soap, characterized in that it is produced by atomization of a slurry of a basic powder of detergent containing the usual components of detergents and containing either no soap or a very low percentage of soap, said soap being added posteriorly to said basic powder by dry-mixing therewith.

11. A method according to claim 10, wherein also the nonionic surfactants are added in post-addition to the atomized basic powder of the detergent composition, together or before or after the addition of the soap.

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EUROPEAN SEARCH REPORT

Application Number

EP 90 12 1266

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	DE-A-1 916 861 (UNILEVER) * Whole document *	1-4,6-10	C 11 D 10 04 C 11 D 11 00
X	DE-A-2 545 190 (HENKEL) * Claims 1-18 *	1	
X	EP-A-0 265 258 (UNILEVER) * Page 3, lines 30-60; page 4, lines 5-11; examples; claims *	1-4,6-10	
A	FR-A-2 328 766 (HENKEL) * Examples; claims *	1	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

C 11 D

The present search report has been drawn up for all claims

Place of search	Date of completion of search	Examiner
The Hague	28 January 91	GOLLER P.

CATEGORY OF CITED DOCUMENTS

X: particularly relevant if taken alone
Y: particularly relevant if combined with another document of the same catagory
A: technological background
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T: theory or principle underlying the invention

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