

(12) **UK Patent Application** (19) **GB** (11) **2 223 028** (13) **A**
(43) Date of A publication 28.03.1990

(21) Application No 8815352.3

(22) Date of filing 28.06.1988

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(51) INT CL⁴
C11D 3/12

(52) UK CL (Edition J)
**C5D D6A5B D6A5D2 D6A5E D6A5F D6A9 D6B10A
D6B10C D6B12G2A D6B12L D6B2 D6B4 D6B7
D6C5
U1S S1372**

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US 4511487 A**

(58) Field of search
**UK CL (Edition J) C5D
INT CL⁴ C11D**

(54) **Detergent composition including fabric softening clay**

(57) A detergent composition in semi-solid form containing at least a non-soap detergent active, a detergency builder and a fabric softening clay. Higher levels (5-40% by weight) of fabric softening clay can be incorporated in semi-solid product forms than in solid bar forms.

DETERGENT COMPOSITIONS

This invention relates to detergent compositions which are in a semi-solid form, that is to say a gel, cream or paste. Such a detergent form is already marketed in some countries. It is sufficiently solid that it cannot be poured, and it coheres together in a mass which can however be deformed by hand. Such a form is thus distinct from mobile liquids, powders and bars.

Semi-solid detergent compositions may be used for washing fabrics, and will then generally contain detergent active and detergent builder materials together with optional components, for example abrasives, fillers, perfumes and alkaline salts, such as silicates.

For use in washing fabrics, a semi-solid composition may be rubbed directly onto the fabric.

The use of clay in detergent compositions as a fabric softening agent is known, e.g. from UK 1,400,898. The use of softening clay in non-soap detergent laundry bars is disclosed in UK 2160886 (Firmenich).

With such laundry bars, however, it is impractical to include clay as more than about 5% by weight of the composition.

We have now found that softening clays can be successfully incorporated in semi-solid built detergent compositions.

According to the present invention there is provided a detergent composition of semi-solid form containing at least:

non-soap detergent active, preferably in an amount which is 10 to 45% by weight of the composition, detergent builder, preferably in an amount which is 5 to 60% by weight of the composition, softening clay, preferably in an amount which is 5 to 40% by weight of the composition.

The clay may be an expandable smectite-type clay. Smectite clays are set out in UK 1,400,898 where they are specified as expandable, three-layer smectite-type clays having an ion exchange capacity of 50 meg/100 gram. They are expandable by swelling on contact with water. Examples of such clays are montmorillonite, volchonskoite, nontronite, hectorite, saponite and sauconite.

The amount of clay may well exceed 10% or even 15% by weight of the composition, e.g. an amount which is 10-25% by weight of the composition.

The stability of a semi-solid composition can be enhanced by adding a structuring agent, and it may be preferred to include a structuring agent in compositions according to this invention.

Conventional structuring agents are coconut ethanolamide (CEA), gelatin, starch, aluminosilicate and sodium carboxy methyl cellulose which also functions as an antiredeposition agent. These structuring agents may be used in combination with of electrolytes.

Detergent actives and builder components are well characterised in detergent bar technology. The components are described in "Surface Active Agents" by Schwartz and Perry (Interscience 1949) and Volume II by Schwartz, Perry

and Berch (Interscience 1958). The detergent actives usable in the present invention may be found in the general classes of anionic, nonionic, amphoteric, betaine and zwitterionic actives. Specific examples of detergent
5 actives are linear alkyl benzene sulphonates, alkane sulphonates, secondary alcohol sulphates, branched alkyl benzene sulphonates, alkyl sulphates, alkyl ether sulphates, olefin sulphonates, monocarboxylic acid salts, ethoxylated alcohols and fatty acid ester sulphonates.
10 Linear or branched alkyl benzene sulphonates having 8 to 16 carbon atoms in the alkyl chain may in particular be used, possibly in admixture with other detergent active(s).

Examples of builder components are: water soluble phosphate salts, e.g. sodium tripolyphosphate,
15 pyrophosphate and orthophosphate; water soluble carbonates, e.g. sodium carbonate; organic builders which may be polycarboxylate sequestrant builders, e.g. sodium nitrilotriacetate, sodium tartrate, trisodium carboxymethyl oxysuccinate, sodium oxydisuccinate and sodium sulphonated
20 long-chain monocarboxylic acids.

Other ingredients, for example silicates e.g. sodium alkaline silicate, starch, sodium carboxymethyl cellulose or other antiredemption agent, polycarboxylate
such as polyacrylate or acrylic/maleic copolymer, colouring
25 materials, enzymes, fluorescers, opacifiers, germicides, perfumes, bleaching agents and fillers, for example sodium sulphate, talc, and calcite are optionally present.

Alkanolamines may be included, as described in our UK published application 2184452A.

Production

A semi-solid detergent composition can be produced by adding the constituents to the water which will be present in the eventual composition, and mixing.

5 A suitable procedure is to heat all the water, and dissolve in it the builder, any other solid electrolyte and sodium carboxymethyl cellulose (if used) while mixing under conditions of high shear. When these components have dissolved, alkaline silicate (if any) is added, followed by
10 detergent active, alkanolamine (if any) and clay. If a structurant such as coconut ethanolamide is used, it is preferably added after the detergent active and alkanolamine.

Examples

15 In the Examples which follow, all percentages are by weight of the composition.

Detergent creams were prepared by the production route given above. Their formulations are set out in the following table:-

<u>Example No:</u>		<u>I</u>	<u>II</u>	<u>III</u>	<u>IV</u>	<u>V</u>
5	<u>Components</u>					
	C ₁₂ , C ₁₆ branched ABS	15.0	30.0			
	C ₁₂ branched ABS			27.0		
	C ₁₂ linear ABS				28.0	26.0
	Sodium tripolyphosphate	25.0	15.0	15.0	15.0	9.0
10	Alkaline silicate	1.5	1.5			2.0
	Neutral silicate			2.0	2.0	
	Coconut ethanolamide			4.0		
	Sodium carbonate				10.0	10.0
	Sodium sulphate	3.5	3.5			
15	Sodium carboxymethyl cellulose	1.0		1.5	1.0	1.0
	Smectite clay	10.0	20.0	15.0	20.0	15.0
	Starch				2.0	
	Fluorescer, perfume	----- below 0.5% -----				
20	Water	----- balance to 100% -----				

C₁₂ branched ABS was alkyl benzene sulphonate with principally C₁₂ branched alkyl groups,

C₁₂, C₁₆ branched ABS was alkyl benzene sulphonate with substantial properties of C₁₂ and C₁₆ branched alkyl

25 groups,

C₁₂ linear ABS was alkyl benzene sulphonate with principally C₁₂ linear alkyl groups.

The clay was Volclay SPV 200NF from American Colloid Co, Skokie, Illinois.

Each of the creams had the appearance of a stiff paste, and had an acceptable non-gritty feel.

5 A trial of one cream (Example IV) was carried out as follows:-

Terry towel cotton squares were repeatedly machine washed without any softening agent, to give them a harsh feel. Half of the squares were then washed by hand,
10 directly applying the cream to them. The remaining squares were washed with a control cream in which the clay was replaced with inert filler (sodium sulphate). The washed squares then assessed for softness of tactile feel by a group of panellists. 90% of the panellists unequivocally
15 chose the squares washed with the clay-containing cream as softer fabric than those washed with the control cream.

Claims

1. A detergent composition of semi-solid form containing
at least:
5
10 to 45% by weight of non-soap detergent active,
5 to 60% by weight of detergency builder,
10 5 to 40% by weight of softening clay.
2. A detergent composition as claimed in claim 1 wherein
the composition comprises 10 to 25% by weight of clay.
- 15 3. A detergent composition as claimed in claim 1 or
claim 2 wherein the composition comprises from 0.5 to 15%
by weight of a structuring agent.