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54 **Softening and bleaching detergent compositions containing amide softening agent.**

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56 References cited :  
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**Description**Technical Field

5 The present invention relates to softening detergent compositions containing a peroxyacid-bleaching compound, and a narrowly-defined amide softening agent.

The compositions herein, in addition to providing good cleaning performance, exhibit excellent through-the-wash softening properties, and provide additional fabric-care benefits such as anti-static, anti-wrinkling, ease-of-ironing, color stability, independently from and in presence of peroxyacid bleaching agents.

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Background of the invention

Formulators of fabric treatment compositions have long sought means for simultaneously washing and softening fabrics. Among the various approaches suggested are methods employing clay softeners, or amine materials, or both ingredients in combination, such as described in e.g.: German Patents 29.64.114, 28.57.16, 24.39.541, 23.34.899 and European Patents 0 026 528 and 0 028 432.

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Amines have been used in combination with soaps (U.K. patent 1 514 276), fatty acids (published E.P.A. 0 133 804) or phosphate esters (published E.P.A. 0 168 889) as through-the-wash softeners.

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It has been found, however, that the presence of peroxyacid-bleach compounds in softening detergent compositions is often detrimental to the stability of the amine softening agent. As a consequence, the utilization of peroxyacid bleaching agents, inclusive of peroxygen bleach-activator combinations, was in such compositions often limited in quantity, and optimum performance could therefore not be obtained. In addition, the softening amine is not well-compatible with peroxyacids, and becomes deactivated as a softener.

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Carboxy-amides have been used as antistatic agents in industrial textile treatment (German patent 30 43 618) and N-alkyl isostearamides as antistatic agents in laundry application (French patent 2,531,447); N-alkyl (15-21 alkylamides have been used as foam suppressors in detergent compositions (US-A-3231508).

Japanese patent J5 8144-175-A discloses the industrial treatment of textile by cationic softening agents and ethoxylated fatty acid amides.

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Alkoxyated fatty amides are known as surfactants (EP-A-0 000 595) and as viscosity control agents (EP-A-0 112 719).

German Patent Application 19 59 007 discloses the use as softening agent of a monoethanolamide. German Patent Application 33 10 417 discloses the use of fatty acids diethanolamides as antistatic/non-yellowing agents.

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It is an object of the present invention to provide detergent compositions capable of providing excellent cleaning, softening, and fabric-care properties.

It is another object of the invention to formulate peroxyacid-containing detergent compositions capable of providing simultaneous cleaning and softening benefits.

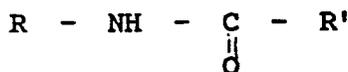
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It has now been discovered that the objects set forth above can be met by using certain amides as softening agents to thereby avoid interaction with peroxyacid bleaching agents and thus provide excellent results in both cleaning and softening of fabric, as well as other "fabric care" benefits.

Summary of the invention

45 The present invention relates to detergent compositions capable of giving through-the-wash fabric-care benefits inclusive of softness, containing an anionic surfactant, a peroxygen bleach or a system capable of yielding a peroxyacid in situ and an amide fabric softening agent having the formula:

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wherein R and R' are straight chain alk(en)yl, aryl, or alkyl-aryl group, each containing from 8 to 22 carbon atoms.

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The surfactant component can comprise as little as 1% of the compositions herein, but preferably the compositions will contain 5% to 40%, more preferably 10% to 30%, of surfactant. Mixtures of the ethoxylated nonionics with anionics such as the alkyl benzene sulfonates, alkyl sulfates and paraffin sulfonates are preferred for through-the-wash cleansing of a broad spectrum of soils and stains from fabrics.

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#### Bleaching compound -

The bleaching compound in the context of the present invention is represented by a peroxyacid bleaching agent. In the context of the present invention, peroxyacid bleaching agent encompasses both a peroxyacid "per se" and systems which are able to yield peroxyacids in situ.

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Peroxyacids "per se" are meant here to include the alkaline and alkaline-earth metal salts thereof. Peroxyacids and diperoxyacids are commonly used; examples are diperoxydodecanoic acid (DPDA) or peroxyphthalic acid.

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Systems capable of delivering peracids in situ consist in a peroxygen bleaching agent and an activator therefor.

The peroxygen bleaching agents are those capable of yielding hydrogen peroxide in an aqueous solution; those compounds are well-known in the art, and include hydrogen peroxide, alkali-metal peroxides, organic peroxide bleaching agents such as urea peroxide, inorganic persalt bleaching agents such as the alkali metal perborates, percarbonates, perphosphates, persulfates, and the like.

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Preferred are sodium perborate, commercially available in the form of mono- and tetra-hydrates, sodium carbonate peroxyhydrate, sodium pyrophosphate peroxyhydrate, urea peroxyhydrate.

The liberated hydrogen peroxide reacts with the bleach activator to form the peroxyacid bleach. Classes of bleach activators include esters, imides, imidazoles, oximes, and carbonates. In those classes, preferred materials include methyl *o*-acetoxy benzoates; sodium-*p*-acetoxy benzene sulfonates such as sodium 4-nonanoyloxybenzene sulfonate; sodium-4-octanoyloxybenzene sulfonate, and sodium-4-decanoyloxybenzenesulfonate; bisphenol A diacetate; tetra acetyl ethylene diamine; tetra acetyl hexamethylene diamine; tetra acetyl methylene diamine.

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Other highly preferred peroxygen bleach activators which are disclosed in U.S. Patents 4,483,778 and 4,539,130, are alpha-substituted alkyl or alkenyl esters, such as sodium-4-(2-chlorooctanoyloxy)benzene sulfonate, sodium 4-(3,5,5-trimethyl hexanoyloxy)benzene sulfonate. Suitable peroxyacids are also peroxygen bleach activators such as described in published European Patent Application N° 0 166 571, i.e., compounds of the general type RXOOH and RXAL, wherein R is a hydroxycarbonyl group, X is a hetero-atom, A is a carbonyl bridging group and L is a leaving group, especially oxybenzenesulfonate.

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#### Detergent adjuncts -

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The compositions herein can contain other ingredients which aid in their cleaning performance. Through-the-wash detergent compositions contain a detergent builder and/or metal ion sequestrant. Compounds classifiable and well-known in the art as detergent builders include the nitrilotriacetates, polycarboxylates, citrates, water-soluble phosphates such as tri-polyphosphate and sodium ortho- and pyro-phosphates, silicates, and mixtures thereof. Metal ion sequestrants include all of the above, plus materials like ethylenediaminetetraacetate, the amino-polyphosphonates and phosphates (DEQUEST®) and a wide variety of other poly-functional organic acids and salts too numerous to mention in detail here. See U.S. Patent 3,579,454 for typical examples of the use of such materials in various cleaning compositions. In general, the builder/sequestrant will comprise 0.5% to 45% of the composition. The 1-10 micrometer size zeolite (e.g. zeolite A) builders disclosed in German Patent 24 22 655 are especially preferred for use in low-phosphate or non-phosphate compositions.

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The laundry compositions herein also preferably contain enzymes to enhance their through-the-wash cleaning performance on a variety of soils and stains, such as amylase & protease enzymes. Amylase and protease enzymes suitable for use in detergents are well-known in the art and in commercially available liquid and granular detergents. Commercial detergent enzymes (preferably a mixture of amylase and protease) are typically used at levels of 0.001% to 2%, and higher, in the present compositions. Other highly desirable detergent ingredients for use in the detergent compositions of the present invention are quaternary ammonium compounds of the form  $R_4R_3R_6R_7N^+X^-$ , wherein  $R_4$  is alkyl having from 10 to 20, preferably from 12-18 carbon atoms, and  $R_5, R_6$  and  $R_7$  are each  $C_1$  to  $C_4$  alkyl preferably methyl;  $X^-$  is an anion, e.g. chloride. Examples of such quaternary ammonium compounds include  $C_{12}$ - $C_{14}$  alkyl trimethyl ammonium chloride and cocoalkyl trimethyl ammonium methosulfate. The quaternary ammonium compounds can be used at levels from 0.5% to 5%, preferably from 1% to 3%.

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Moreover, the compositions herein can contain, in addition to ingredients already mentioned, various other

optional ingredients typically used in commercial products to provide aesthetic or additional product performance benefits. Typical ingredients include pH regulants, perfumes, dyes, optical brighteners, soil suspending agents, hydrotropes and gel-control agents, freeze-thaw stabilizers, bactericides, preservatives, suds control agents, bleach stabilizing agents.

5 In a through-the-wash mode, the compositions are typically used at a concentration of at least 500 ppm, preferably 0.10% to 1.5%, in an aqueous laundry bath at pH 7-11 to launder fabrics. The laundering can be carried out over the range from 5°C to the boil, with excellent results.

10 Form and Preparation of the compositions -

The detergent compositions of the present invention can be in granular, liquid, or sheet-like form. They may be prepared in any way, as appropriate to their physical form, as by mixing the components, co-agglomerating them, micro-encapsulating them, dispersing them in a liquid carrier, releasably adsorbing or coating them onto a non-particulate substrate, such as a non-woven or paper sheet.

15 Preferably, the compositions are in granular form.

A highly preferred method of preparation of said granular compositions consists in preparing a melt of the dispersing agent and the amide, dispersing the molten mixture into a stirred, aqueous crutcher mix comprising the balance of the deterative ingredients, and spray-drying in standard fashion. In alternate but much less preferred modes, the melt can be atomized onto the detergent granule or allowed to solidify, ground in a colloid mill, and dry-mixed with the balance of the detergent composition. The compositions herein may also be sprayed onto particles of, e.g., sodium perborate mono or tetrahydrate, sodium sulfate, sodium carbonate, sodium silicate, sodium phosphate, or clay of the type described above.

25 Industrial Application

The following examples are typical of the preferred execution of the invention, but are not intended to limit the scope.

30 EXAMPLE

N-tallow tallowamide (total 6% of complete formulation after spray-drying) and stearic acid (2% of complete formulation) are admixed, melted in a jacketed batch and stirred until homogeneity. A standard aqueous crutcher mix comprising the following ingredients is prepared (percentages listed relate to percent ingredients in the complete formulation after spray-drying).

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	<u>Ingredients</u>	<u>Percent</u>
	C <sub>11</sub> -C <sub>12</sub> alkyl benzene sulfonate	6.2
5	Tallow alcohol ethoxylate (EO11)	1.0
	Sodium tripolyphosphate	24.0
	Sodium sulfate	15.0
10	Sodium silicate	8.0
	Smectite clay *	6.5
	Carboxymethyl cellulose	0.4
	Polyacrylate (soil suspender)	1.7
15	Enzymes	0.5
	Optical brightener	0.23
	Sulfonated zinc phthalocyanine **	25 ppm
20	EDTA	0.2
	Perfume/copper salts/minors	0.5
	C <sub>12</sub> -C <sub>14</sub> alkyl trimethylammonium chloride	1.9
25	Moisture	to 77%

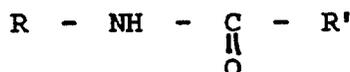
- 30 \* Natural smectite: ion exchange capacity above  
50 meq/100 g clay
- \*\* U.S. Patent 3.927.967

35 The N-tallow tallowamide/stearic acid melt is poured into the crutcher mix (60-90°C). The crutcher mix-plus-N-tallow tallowamide/stearic acid is then handled in entirely standard fashion, and spray-dried to form the final composition. After drying sodium perborate, (20%) and bleach activator (3% 3-5-5-trimethyl hexamaic acid, sulfapheryl ester, sodium salt\*\*\* are dry-mixed with the granules.

40 Very good results were obtained in softness and fabric-care benefits, compared to an identical composition which did not contain the N-tallow tallowamide/stearic acid premix (reference).

### Claims

45 1. A detergent composition comprising an anionic surfactant, a peroxyacid bleach or a system capable of yielding a peroxyacid in situ, and an amide fabric softening agent having the formula :

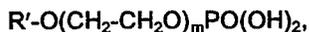


50 wherein R and R' are straight chain alk(en)yl, aryl, or alkyl-aryl groups, each containing from 8 to 22 carbon atoms.

55 2. A composition in accordance with claim 1 wherein the amide softening agent is predispersed, before being added to the rest of the detergent composition, with a dispersing agent selected from :

- nonionic surfactants resulting from the condensation of primary or secondary aliphatic alcohols;
- phosphate esters having the formula

\*\*\* U.S. Patents 4.483.778 & 4.539.130.



with  $R'=C_{12}-C_{14}$  and  $m=1-5$ ;

– fatty acids having from 10 to 20 carbon atoms in the alkyl chain.

3. A composition in accordance with Claim 2 wherein the dispersing agent is a fatty acid having from 10 to 20 carbon atoms in the alkyl chain and is present in a weight ratio of amide softening agent to fatty acid of from 1:1 to 10:1.

4. A composition in accordance with Claims 1-3 wherein the peroxyacid bleaching agent is comprised of a peroxygen bleaching compound and an activator therefor.

5. A composition in accordance with Claims 1-4 wherein the amide softening agent is present at levels of from 0.1% to 15% by weight.

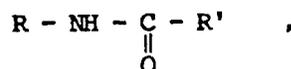
6. A composition in accordance with Claims 1-5 wherein the amide softening agent is selected from N-cocoalkyl stearamide and N-tallow tallowamide.

7. A composition in accordance with any of the preceding claims, which in addition contains a clay softener.

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### Patentansprüche

1. Detergenezusammensetzung, umfassend ein anionisches grenzflächenaktives Mittel, ein Peroxysäurebleichmittel oder ein System, welches fähig ist, eine Peroxysäure in situ zu liefern, und einen Amid-Gewebeweichmacher mit der Formel:

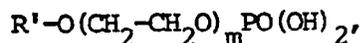


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worin R und R' geradkettige Alk(en)yl-, Aryl- oder Alkyl-aryl-Gruppen sind, wovon jede 8 bis 22 Kohlenstoffatome enthält.

2. Zusammensetzung nach Anspruch 1, worin der Amid-Weichmacher vor dem Zusetzen zum Rest der Detergenezusammensetzung mit einem Dispergierungsmittel, welches unter:

- nichtionischen grenzflächenaktiven Mitteln, welche aus der Kondensation von primären oder sekundären aliphatischen Alkoholen stammen;
- Phosphateestern mit der Formel



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worin R'  $C_{12}-C_{14}$  darstellt und m den Wert 1 - 5 besitzt;

– Fettsäuren mit 10 bis 20 Kohlenstoffatomen in der Alkylkette, ausgewählt ist, vordispersiert wird.

3. Zusammensetzung nach Anspruch 2, worin das Dispergierungsmittel eine Fettsäure mit 10 bis 20 Kohlenstoffatomen in der Alkylkette ist und in einem Gewichtsverhältnis von Amid-Weichmacher zu Fettsäure von 1:1 bis 10:1 vorliegt.

4. Zusammensetzung nach den Ansprüchen 1 bis 3, worin sich das Peroxysäurebleichmittel aus einer Peroxysäurebleichmittelverbindung und einem Aktivator hierfür zusammensetzt.

5. Zusammensetzung nach den Ansprüchen 1 bis 4, worin der Amid-Weichmacher in Mengen von 0,1 Gew.-% bis 15 Gew.-% vorliegt.

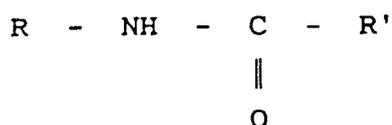
6. Zusammensetzung nach den Ansprüchen 1 bis 5, worin der Amid-Weichmacher unter N-Kokosalkylstearamid und N-Talg-talgamid ausgewählt ist.

7. Zusammensetzung nach einem der vorherstehenden Ansprüche, welche zusätzlich einen Tonweichmacher enthält.

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### Revendications

1. Composition détergente comprenant un tensioactif anionique, un agent de blanchiment au peracide ou un système capable de donner un peracide in situ, ainsi qu'un agent d'assouplissement des textiles contenant un amide, ayant la formule :



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dans laquelle R et R' sont des radicaux alkyle ou alcényle, aryle ou alkylaryle à chaîne droite contenant chacun 8 à 22 atomes de carbone.

2. Composition selon la revendication 1, dans laquelle l'agent d'assouplissement contenant un amide est prédispersé, avant addition au reste de la composition détergente, à l'aide d'un agent de dispersion choisi parmi :

– les tensioactifs non ioniques résultant de la condensation d'alcools aliphatiques primaires ou secondaires ;

– les esters phosphates de formule



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avec  $R' = C_{12}-C_{14}$  et  $m = 1-5$  ;

– les acides gras ayant de 10 à 20 atomes de carbone dans la chaîne alkyle.

3. Composition selon la revendication 2, dans laquelle l'agent de dispersion est un acide gras ayant de 10 à 20 atomes de carbone dans la chaîne alkyle et est présent selon une proportion pondérale entre l'agent d'assouplissement contenant un amide et l'acide gras de 1:1 à 10:1.

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4. Composition selon les revendications 1 à 3, dans laquelle l'agent de blanchiment au peracide est constitué d'un composé de blanchiment peroxygéné et d'un activateur de ce dernier.

5. Composition selon les revendications 1 à 4, dans laquelle l'agent d'assouplissement contenant un amide est présent en des quantités de 0,1 à 15 % en poids.

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6. Composition selon les revendications 1 à 5, dans laquelle l'agent d'assouplissement contenant un amide est choisi parmi le N-(alkyl dérivé de l'huile de coprah)-stéaramide et le N-(suif)-(suif)-amide.

7. Composition selon l'une quelconque des revendications précédentes, qui en outre contient un assouplissant du type argile.

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