



(12)

EUROPEAN PATENT APPLICATION

(21) Application number : **93306497.4**

(51) Int. Cl.⁵ : **C11D 1/58, D06M 13/352**

(22) Date of filing : **18.08.93**

(30) Priority : **28.08.92 GB 9218330**

(43) Date of publication of application :
02.03.94 Bulletin 94/09

(84) Designated Contracting States :
CH DE ES FR GB IT LI NL SE

(71) Applicant : **UNILEVER PLC**
Unilever House Blackfriars
London EC4P 4BQ (GB)
(84) **GB**

(71) Applicant : **UNILEVER N.V.**
Weena 455
NL-3013 AL Rotterdam (NL)
(84) **CH DE ES FR IT LI NL SE**

(72) Inventor : **Azoz, Nazar Essa Naom, Unilever Research**
Port Sunlight Lab., Quarry Road East,
Bebington
Wirral, Merseyside, L63 3JW (GB)

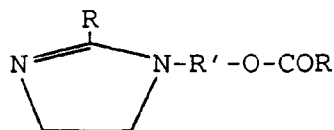
(74) Representative : **Fransella, Mary Evelyn et al**
Unilever PLC Patent Division Colworth House
Sharnbrook
Bedford MK44 1LQ (GB)

(54) **Use of fabric softening composition.**

(57) Use as a cotton fibre damage inhibitor or fibre protector of a fabric softening composition comprising at least 1% by weight of a substituted cyclic amine compound.

The present invention relates to the use of a fabric softening composition comprising a substituted cyclic amine as a fabric damage inhibitor or fibre protector.

Rinse added fabric softening compositions are well known. A class of relatively biodegradable cyclic amines that are known for use in fabric softening compositions are the ester imadazolines of the following formula:



where R is C₁₂₋₂₂ alkyl

and R' is C₁₋₄ alkyl

A preferred cyclic amine is 1-(N-tallowoyloxyethyl)-2-tallow-4,5 dihydroimidazole which can also be given the name 1-tallowacyloxyethyl-2-tallowimidazoline. Typically fabric softening compositions contain a level of cyclic amine softening material up to 7% by weight in which case the compositions are considered dilute, or a level from 7% to 50% in which case the compositions are considered concentrates. In addition to softening, fabric softening compositions desirably have other benefits. Such other benefits are particularly important for consumers who believe that the use of fabric softening compositions causes damage to the environment and that the damage outweighs the softening benefit obtained.

A typical wash will include some fabric containing cotton fibres. Abrasion of cotton fibres under wet conditions results in cotton fibre fibrillation whereby the cotton fibres are gradually broken down into their component fibrils and into fibrillar sheets. Such fibrillation is an important mechanism by which fabrics are damaged during wash processes. Damaged fabrics scatter light to a greater extent than undamaged fabrics and the scattering causes dulling of fabric colours. Ultimately the damage will result in mechanical disintegration of the fibre and the consequent failure of cotton garments. The main causes of fibrillation have been found to be swelling of the fibres when wet and friction. Both wet and dry friction cause damage.

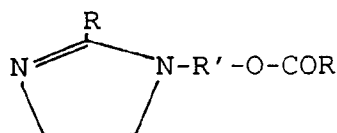
It is an object of the present invention to provide a method of inhibiting damage to cotton fibres and thereby to increase the life of garments containing the fibres.

According to the invention there is provided the use as a fabric damage inhibitor of a fabric softening composition comprising a substituted cyclic amine.

Throughout this specification the term inhibitor includes a component which confers protective care or protection on a fibre. In particular it encompasses those materials which reduce the damage to the fibre which would otherwise occur during the course of wearing and washing a garment.

Preferably the composition is a liquid comprising an aqueous base.

A preferred type of substituted cyclic amine for use in the compositions according to the invention is represented by the formula:



where R is C₁₂₋₂₂ alkyl

and R' is C₁₋₄ alkyl

The composition can also contain fatty acids for example C₈ - C₂₄ alkyl or alkenyl monocarboxylic acids or polymers thereof. The fatty acids are preferably present as a complex with the amine in the form of microfine particles in the range 0.1 to 20 micrometers. Preferably saturated fatty acids are used, in particular, hardened tallow C₁₆-C₁₈ fatty acids. Preferably the fatty acid is non-saponified, more preferably the fatty acid is free; for example oleic acid, lauric acid or tallow fatty acid.

The level of fatty acid material is preferably more than 0.1% by weight, more preferably more than 0.2%

by weight. Especially preferred are concentrates comprising from 0.5 to 20% by weight of fatty acid, more preferably 1% to 10% by weight. The weight ratio of quaternary ammonium material to fatty acid material is preferably from 10:1 to 1:10.

The compositions of the invention preferably have a pH of more than 2, more preferably between 2 and 5.

The composition can also contain one or more optional ingredients, selected from non-aqueous solvents, pH buffering agents, perfumes, perfume carriers, fluorescers, colorants, hydrotropes, anti-foaming agents, anti-redeposition agents, enzymes, freeze-thaw stabilisers, optical brightening agents, opacifiers, anti-shrinking agents, anti-wrinkle agents, anti-spotting agents, germicides, fungicides, anti-oxidants, anti-corrosion agents, drape imparting agents, antistatic agents and ironing aids.

The composition may also contain nonionic fabric softening agents such as lanolin and derivatives thereof, or complexing compounds such as the phosphate esters described in EP 0168889.

The invention will now be illustrated by the following non-limiting examples and with reference to the accompanying drawing which is a diagrammatic representation of the fibre damage test apparatus used. In the examples all percentages are expressed by weight.

The figure shows a yarn on yarn abrasion tester with a test yarn 1 comprising fibres. The two ends of the yarn are attached to metal links 2 and 3. Metal link 2 joins the yarn to a cord 4 which passes over a first upper yarn guide pulley 4A and is attached to a tensioning weight 5. Typically a 20 g tensioning weight is used. The other end of the yarn is attached to a second cord 6 by the metal link 3. Between the metal links the yarn is twisted about itself in the test region 7 and is weighed down by passing the yarn around a lower yarn guide pulley 8. The second cord 6 passes over a second upper yarn guide pulley 9 and is attached to an electrically driven reciprocating means 10.

The test method consists of attaching the yarn to be tested to one of the metal links, passing the yarn around the lower yarn guide pulley 9 and then twisting the yarn around itself a predetermined number of times to form the test region 7, before attaching it to the other metal link. The reciprocating means is then switched on. A record is kept of the number of oscillations of the reciprocating means before failure. In each of the following examples the test was repeated a number of times and very high or low results discarded before a statistical analysis was made of the remaining data.

Example 1

100% extracted Terry Cotton yarns were washed for 15 minutes at 50°C using the recommended dose of a washing powder sold under the trade mark "New Persil automatic" and having the composition:

6.0	Alkyl benzene sulphonate
4.5	Nonionic 7EO
3.5	Nonionic 3EO
25.0	Sodium tripolyphosphate
10.0	perborate tetrahydrate
25.0	sodium sulphate
5.0	sodium carbonate

water and minor ingredients to balance

The yarns were then rinsed. Some yarns were rinsed in water as a control and others were rinsed in fabric softening compositions. Two fabric softening compositions were used, one containing the cationic quaternary ammonium Arquad 2HT as the fabric softening material and the other sold under the trade mark "Lenor" and containing an imidazoline amine ester as the fabric softening material.

The compositions of the two fabric softening compositions were as follows:

COMPOSITION A

12.8	DHTDMAC ¹
3.2	HTFA ²
0.75	PERFUME
	water to balance

1. DHTDMAC is dihardened tallow dimethyl ammonium chloride available as Arquad 2HT from Akzo Chemie.
2. is hardened tallow fatty acid, Pristerine 4916 ex Unichema.

COMPOSITION B

This is a commercially available concentrated fabric softening composition sold under the trade mark "Lenor" by Procter and Gamble. The analysed composition has been found to be:

20.5 Imidazoline amine ester
2.8 Fatty acid ester
0.9 Free fatty acid
0.05 Silicone
water and minors to balance

The compositions were used at recommended concentrations in cold water. After rinsing, the yarns were allowed to dry for 24 hours at room temperature. They were then individually abraded on the yarn on yarn abrasion tester. Abrasion tests were carried out dry.

Table 1 shows the mean number of cycles before 24 samples of yarn failed in a dry abrasion test.

TABLE 1

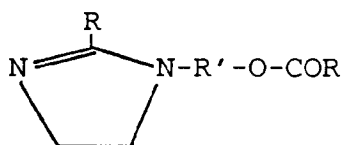
Treatment	Number of cycles to failure
Water	964
Composition A	1503
Composition B	1748

The difference in the number of cycles to failure between the samples rinsed with Composition B according to the present invention and the other samples is not as great as the difference between Composition A and the water control. In order to check whether the differences were statistically significant F and T tests were performed on the data. It can be concluded from this analysis that the use of a fabric softening composition gives reduced fibre damage during the dry abrasion that would occur when a garment is being worn.

Furthermore it can be seen that the use of a fabric softening composition containing an imidazoline amine ester according to the present invention provides the best protection. A photomicrograph was made for the failed fibre and showed that the yarn did not suffer fibrillation damage.

Claims

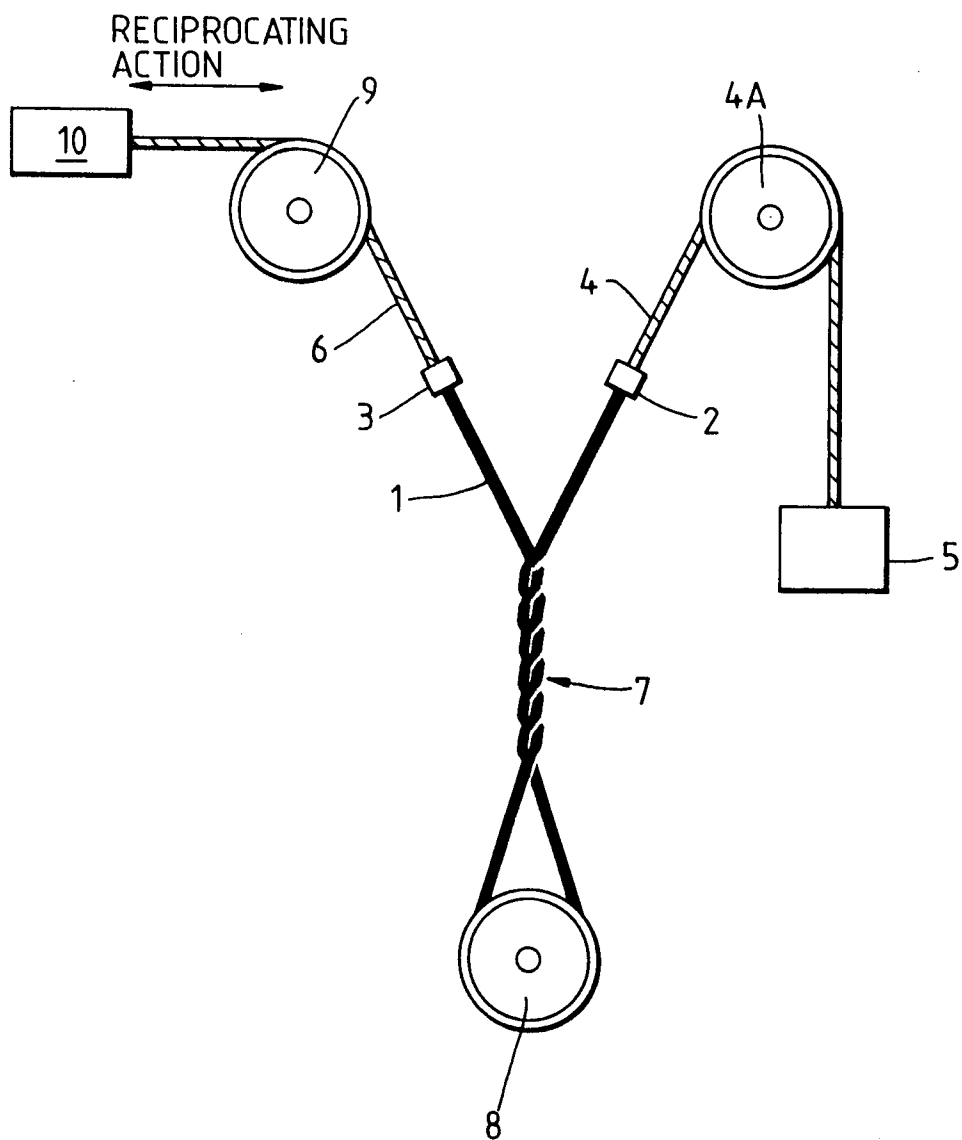
1. Use as fibre damage inhibitor or fibre protector of a fabric softening composition comprising at least 1% by weight of a substituted cyclic amine.
2. Use of a substituted cyclic amine as claimed in claim 1 wherein the amine is an imidazoline amine ester which can be represented by the formula:



where R is C₁₂₋₂₂ alkyl
and R' is C₁₋₄ alkyl

3. Use of an amine as claimed in claim 1 or claim 2 wherein the fabric softening composition comprises a fatty acid material.
4. Use of an amine as claimed in claim 2 wherein the amine has the formula 1-(N-tallowoyloxyethyl)-2-tallow-4,5 dihydroimidazole.

SCHEMATIC DIAGRAM OF YARN-ON-YARN ABRASION TESTER





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number

DOCUMENTS CONSIDERED TO BE RELEVANT			EP 93306497.4
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	<u>GB - A - 1 565 808</u> (HOECHST) * Claims 1-3 * --	1-4	C 11 D 1/58 D 06 M 13/352
A	<u>EP - A - 0 302 567</u> (THE PROCTER & GAMBLE) * Page 9, lines 36-45; page 10, lines 17-41 * --	1-4	
A	<u>EP - A - 0 345 842</u> (THE PROCTER & GAMBLE) * Page 4, lines 39-53; page 9, line 39 - page 10, line 18; examples; claims 1,7-9 * ----	1-4	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5) C 11 D D 06 M
The present search report has been drawn up for all claims			
Place of search VIENNA	Date of completion of the search 30-09-1993	Examiner SEIRAFI	
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

EPO FORM 1503 03.82 (P0401)