

1

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LAUNDERING COMPOSITION

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This invention relates to a laundering composition particularly adapted for laundering woolens.

The laundering of woolens under conditions common in the art produces fabric shrinkages of two different types. The first type is relaxation shrinkage. Relaxation shrinkage is defined as the shrinkage realized in a fabric due to the removal of stresses and strains imparted to the fabric during weaving, knitting or the finishing operations. The blocking or stretching of a wet woolen fabric over a form as to a desired set of dimensions previous to drying is a prime cause of relaxation shrinkage. The stretched dimension of the woolen fabric is constant only so long as the wool remains dry.

The second type of shrinkage encountered in the laundering of woolens is felting shrinkage. Whereas relaxation shrinkage can be recovered by stretching or blocking, felting shrinkage is irreversible and is, therefore, the more critical of the two types of shrinkage. The causes of felting are well understood in the art.

The invention hereafter described relates to a method of laundering woolens without resultant felting shrinking.

A feature of this invention therefore is to provide an improved laundering composition particularly adapted for laundering woolens.

A further feature of the invention is to provide such a composition comprising a non-ionic surface active agent and an amine that is either an aliphatic amine, an alkanolamine, an aliphatic ether of an alkanolamine or an aromatic ether of an alkanolamine together with a lubricant for the woolen fibers.

Other features and advantages of the invention will be apparent from the following description.

The composition of this invention comprises basically a non-ionic surface active agent, an amine as specified above and a lubricant for the woolen fibers. The preferred amounts are about 5-20 parts of the surface active agent and about 2-30 parts of the amine. The amount of lubricant can be any desired amount to give resiliency and a soft feel to the fabric and this amount is well understood by those skilled in the art. In general, however, the amount of lubricant will vary between 0.7-20 parts. All parts, percentages and proportions herein are by weight.

The preferred amine is an alkanolamine with the alkyl radical being of relatively low molecular weight, preferably of 2-6 carbon atoms. Typical alkanolamines are monoethanolamine, diethanolamine, triethanolamine, N-methylethanolamine, N-methyl diethanolamine, dimethyl ethanolamine, N,N-diethyl ethanolamine, N-butyl ethanolamine, N,N-dibutyl ethanolamine, N,N-diisopropyl ethanolamine, N-amino-ethyl ethanolamine, N-ethyl diethanolamine, benzyl dimethylamine, dimethylamine, phenyl ethanolamine, monoisopropanolamine, diisopropanolamine, mixed isopropanolamines, dibutyl isopropanolamine, morpholine, N-methyl morpholine, N-(2-hydroxyethyl) morpholine, 2,6-dimethyl morpholine, N-ethyl morpholine, N-aminopropyl morpholine, N-amino-ethyl morpholine and cyclic amines such as piperazine derivatives.

2

The following types of surfactants can be used in this composition:

- (1) Anionic surfactants:
 - (1) Carboxylic acids
 - (2) Sulfuric esters
 - (3) Alkanesulfonates
 - (4) Alkylarylsulfonates
 - (5) Mahogany and petroleum sulfonates
 - (6) Phosphorus compounds
 - (7) Other sulfur containing acids
 - (8) Anionic rosin derivatives
 - (9) Lignin derivatives
- (2) Cationic surfactants:
 - (1) Non-quaternary nitrogen bases
 - (2) Quaternary nitrogen bases
 - (3) Other bases such as sulfonium compounds
- (3) Other non-ionics:
 - (1) Polyethenoxy surfactants
 - (2) Hydrophilic intermediates
 - (3) Polyhydroxy nonionic surfactants
 - (4) Ampholytic surfactants
- (4) New types:
 - (1) Organo-silicon compounds
 - (2) Phosphorus compounds
 - (3) Highly fluorinated compounds
 - (4) Sulfoxides
 - (5) Polymeric surfactants

The preferred surface active agent includes the reaction product of an aliphatic alcohol and an alkylene oxide, particularly either ethylene oxide or propylene oxide. Excellent surface active agents are those that are the reaction product of about 2-20 mols of alkylene oxide per mol of aliphatic alcohol. The type of surface active agent that has been found particularly desirable is Siponic BC made by American Alcolac Company and comprises the reaction product of a mixture of ethylhexyl, tridecyl and isohexadecyl alcohols containing 2-20 mols of ethylene oxide per mol of the alcohol.

The lubricant for the wool fibers is used to make the fibers resilient and lively and to produce a good feel. Typical lubricants are fatty or oily materials such as lanolin, lanolin derivatives, mineral oil, fatty alcohols, polyoxyalkylene glycols, protein derivatives, fatty acid glycerides and the like.

The laundering composition is preferably in the form of a water dispersion of ingredients. The term "dispersion" herein is intended to include both dissolved materials and multimolecular dispersions.

In order to disperse efficiently the water insoluble ingredients such as the lubricant a dispersing agent is used. These may be any of the well known types and an excellent example is glycerol monostearate because it is an excellent emulsifier for a wide variety of water insoluble materials. A polyglycol is also preferably used as it with the amine compound operates as a softener for the wool fibers.

Although not necessary, the composition also preferably contains a moth proofing agent which will then be automatically deposited on the wool during the laundering. Such a moth proofing agent is sodium pentachlorodihydroxytriphenylmethanesulfonate.

The composition also preferably contains an optical dye which is now widely used to brighten fabrics. Typical optical dyes are disclosed in the Colour Index under the heading "Brightening Agents." The optical dye used in this invention may be any one of those disclosed in

the Colour Index or mixture of two or more of any of those discussed therein. Certain of these dyes are disclosed in the publication "Soap and Chemical Specialties" for August 1956 beginning at page 3. These include "Tinopal RBS," "Tinopal" RBS 200, "Tinopal" GS, "Tinopal" SP and "Tinopal" 4BM Concentrate. The preferred brightener is a stilbene triazine derivative having the structural formula shown at (A) in FIG. 1 on page 4 of the above publication.

A typical laundering composition formula is the following.

Water fraction A:	Parts
Siponic BC -----	5-20
Glycerol monostearate -----	1-10
Triethanolamine -----	2-30
Polyethylene glycol -----	1-10
Water to make 100 parts.	
Oil fraction B:	Parts
Lanolin -----	.2-10
Light mineral oil -----	.5-10
Total -----	100

In addition a moth proofing agent such as the above described agent may be used in an amount such as 0.1 part in the above total of parts. An optical dye such as the stilbene triazine derivative given at (A) in FIG. 1 on page 4 of the above publication may also be used in any amount desired which in the above formula may be about 0.1 part.

To produce the final composition each of the water fraction and oil fraction is heated to a temperature of 70-80° C. and the two are then mixed by adding the oil fraction to the water fraction with continuous agitation. As soon as a dispersion has been formed the mixture is cooled to room temperature. Then, in using the washing composition any amount desired may be added to the wash water and an excellent amount has been found to be one ounce per five gallons of water.

Example I

In washing a woolen sweater in an ordinary home type washing machine using 130° F. wash water with a high agitation setting, normal cycle, and a five minute wash followed by drying in a home dryer at hot setting, normal speed, the following composition was used and the sweater was found to be completely clean with no discernible felting shrinkage. The formula used is as follows.

Water fraction A:	Parts
Siponic BC -----	20.0
Glycerol monostearate -----	4.0
Triethanolamine -----	8.0
Polyethylene glycol -----	4.0
Water to make a total of 100 parts for the entire formula.	
Oil fraction B:	Parts
Moth proofing agent (as listed above) -----	0.1
Lanolin -----	2.0
Light mineral oil -----	4.0
Optical dye -----	0.1

A and B were each heated to 70° C. They were then combined by adding B to A slowly with rapid hand agitation until it was observed that a uniform emulsion had been produced. The mixture was then cooled to room temperature. Approximately 0.25% based on the amount of wash water was added to water to make the washing

composition used in the above laundering of the woolen sweater.

Example II

In the following example all ingredients except the water are mixed in a container by stirring and then the water is added last and stirred. The mixing may be done at ordinary room temperature.

	Parts
Siponic BC -----	10
Light mineral oil -----	20
Mixed C ₁₂ and C ₁₃ alcohols -----	10
Decyl alcohol with 12 mols of ethylene oxide -----	6
Triethanolamine -----	2
Water to make a total of 100 parts.	

In the above formula of Example II, the emulsifier may be used in an amount between 5 and 20 parts while all other ingredients except the water may be used in amounts between .05 and 20 parts.

All amounts herein are by weight.

Having described our invention as related to the embodiments set out herein, it is our 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.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A laundering composition particularly adapted for laundering woollens, consisting essentially of: from about 5-20 parts of a cleansing detergent reaction product of between about 2-20 mols of a member of the class consisting of ethylene oxide and propylene oxide per mol of a mixture of ethylhexyl, tridecyl and isohexadecyl alcohols; from about 2-30 parts of an amine member of the class consisting of monoethanolamine, diethanolamine, triethanolamine, N-methyl ethanolamine, N-methyl diethanolamine, dimethyl ethanolamine, N,N-diethyl ethanolamine, N-butyl ethanolamine, N,N-dibutyl ethanolamine, N,N-diisopropyl ethanolamine, N-aminoethyl ethanolamine, N-ethyl diethanolamine, benzyl dimethylamine, dimethylamine, phenyl ethanolamine, monoisopropanolamine, diisopropanolamine, mixed isopropanolamines, dibutyl isopropanolamine, morpholine, N-methyl morpholine, N-(2-hydroxyethyl) morpholine, 2,6-dimethyl morpholine, N-ethyl morpholine, N-aminopropyl morpholine and N-aminoethyl morpholine; and from about 0.7-20 parts of a wool lubricant member of the class consisting of fatty and oily lubricants for the wool to make the wool resilient and lively, said parts being by weight of the composition.

2. The composition of claim 1 wherein said oxide is ethylene oxide.

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