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OILING AND DRESSING FIBERS

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The present invention relates to oiling and dressing fibers.

Hitherto either fats, oils or acids of fats or mineral oils or mixtures of these agents have been employed for the oiling of fibers in the preparatory operations for spinning and similar mechanical operations for the manufacture and production of textiles. Soap solutions are also used for many purposes. In order to produce results free from objection and to avoid difficulties during the improving process, it is necessary to remove the oils from the materials again by saponification or emulsification while employing washing agents, chiefly soaps. In most cases alkalies are also used. This process saves a series of dangers especially for the treatment of wool but injury to the fibers by alkali is easily possible. Hard water readily forms calcium soaps with the soaps employed or formed during the saponification, and soap residues stubbornly retained by the fibers may give rise to injury when dyeing or carbonizing.

We have now found that the objections of oiling and dressing with the said agents are avoided and a much more efficient and, for many purposes, more suitable impregnation is effected by treating the fibrous material before mechanically working it, especially before spinning, with non-coloring condensation products, i. e. esters, amides or ester-amides, or salts thereof, of alkylolamines with high molecular organic acids, such as carboxylic acids, containing at least 7 carbon atoms, sulphonic acids or sulphonated carboxylic acids. As examples of suitable alkylol amines may be mentioned mono-, di- and tri-ethanolamine, propanolamine, hydroxyethylaniline, cyclohexyl diethanolamine, monoethanol ethylenetetramine or acid amides thereof, hydroxyethyl morpholine and the conversion products of these amines with aldehydes, such as from acetaldehyde and monoethanol amine oleic ester

$$(NH_2—C_2H_5O—O—C_{18}H_{33})$$

or mixtures of these amines. As suitable acids may be mentioned for example the high molecular acids of fats and oils of vegetal origin or their synthetic equivalents, hydroxy fatty acids, derivatives of fatty acids containing, for example, amino or halogen groups, aromatic carboxylic acids, naphthenic acids as well as sulphonation products of all these acids including sulphonic acids as well as sulphuric esters, sulphonic acids prepared from brown coal tar oils or from petroleum hydrocarbons, sulphonic acids of the benzene or naphthalene series which have one or more side chains of aliphatic or cycloaliphatic nature, sulphonic acids of cycloaliphatic-aromatic or heterocyclic substances and the like such as those of tetrahydronaphthalene, pyridine and the like.

The condensation products of the alkylol amines with the acids specified may be esters or amides or, when a sufficient quantity of acid has been employed they may be ester amides in which the hydroxyl as well as the amino group of the alkylol amine employed is esterified and respectively amidated as is explained in applicants' copending application Serial No. 340,015 filed February 14, 1929.

In addition to the acid radicles hereinbefore specified, one or more radicles of other organic or inorganic acids of low molecular weight, as for example sulphuric acid, hydrochloric acid, tartaric acid, glycolic acid, and the like may be present in the esters, amides or ester-amides and/or may form salts of the condensation products.

The said substances, which have an oily to fatty character, may be employed either as such or in the emulsified form, for example in the form of aqueous emulsions containing from 2 to 30 per cent of the condensation products, which may be incorporated with compatible emulsifying agents, i. e. those of oily or fatty nature, as for example soaps, Turkey red oils of any type, protective colloids and the like. Moreover, other additions, such as oiling additions, such as olive oil, olein or mineral oils and/or organic solvents and diluents, may be made to alter the viscosity or to improve the emulsability.

The advantage of employing the said condensation products lies in the fact that the said esters, amides or ester-amides are capable of forming water-soluble salts with acids, so that without further treatment they may be washed out in washing baths to which acid has been added without the employment of soaps and alkalies. They produce thereby an intensive foam and have themselves a considerable washing action in acid solutions, so that mixtures of the substances hereinbefore described with fatty oils, oleic acids or mineral oils and the like, may also be employed for greasing.

The following examples will further illustrate the nature of this invention, but the invention is not restricted to these examples. The parts are by weight.

Example 1

100 parts of loose wool are sprayed with 3 parts of a condensation product from mono-hydroxy-

ethyl amine and oleic acid, which may also be employed in the form of an aqueous from 2 to 30 per cent emulsion. The wool is spun into carded yarn or worsted in the manner already known. If desired up to 50 per cent of the condensation product may be replaced by olive oil.

The washing out may be very well carried out with soap, but it proceeds much more simply by a washing bath to which has been added formic acid or another acid, whereby simultaneously the wool is washed and softened.

Example 2

100 parts of wool are sprayed with 5 parts of the ester prepared from 1 molecular proportion of tri-hydroxyethyl amine with 1 molecular proportion each of oleic acid and oleic acid sulphonic acid, and are worked up in the manner usually employed for felting in the hat industry. A special washing is not necessary because during the acid felting process the condensation product employed is removed from the fibers by the sulphuric acid employed.

Example 3

100 parts of rags of wool or cotton or of a mixture of both are sprayed with 10 parts of an ester-amide prepared from 1 molecular proportion of mono-hydroxy ethyl ethylene-tetramine and 2 molecular proportions of oleic acid; they may then be torn and further worked up in the usual manner for spinning which latter process is rendered very easy and furnishes a very good yarn.

What we claim is:

1. As new articles of manufacture fibers having a coating of an amide of a hydroxy ethyl amine with oleic acid.

2. The process of oiling and dressing fibers, which comprises treating fibers with a non-colouring condensation product of an alkylol amine with an aliphatic carboxylic acid containing at least 7 carbon atoms, said condensation product being selected from the class consisting of amides, esters, ester amides and salts of amides, esters and ester amides.

3. The process of oiling and dressing fibers, which comprises treating fibers with an aqueous emulsion of a non-colouring condensation product of an alkylol amine with an aliphatic carboxylic acid containing at least 7 carbon atoms, said condensation product being selected from the class consisting of amides, esters, ester amides and salts of amides, esters and ester amides.

4. The process of oiling and dressing fibers, which comprises treating fibers with an aqueous emulsion of a non-colouring condensation product of an alkylol amine with an aliphatic sulphonic acid containing at least 7 carbon atoms, said condensation product being selected from the class consisting of amides, esters, ester amides and salts of amides, esters and ester amides.

5. The process of oiling and dressing fibers, which comprises treating fibers with an aqueous emulsion of a non-coloring condensation product of an alkylol amine with an aliphatic sulphonated carboxylic acid containing at least 7 carbon atoms, said condensation product being selected from the class consisting of amides, esters, ester amides and salts of amides, esters and ester amides.

6. The process of oiling and dressing fibers, which comprises treating fibers with an aqueous emulsion of a non-colouring condensation product of a hydroxy ethyl amine with a carboxylic acid containing at least 7 carbon atoms, of the type of the fatty acids of vegetable oils and fats, said condensation product being selected from the class consisting of amides, esters, ester amides and salts of amides, esters and ester amides.

7. The process of oiling and dressing fibers, which comprises treating fibers with an aqueous emulsion of a non-colouring condensation product of a hydroxy ethyl amine with a carboxylic acid containing at least 7 carbon atoms, of the type of the fatty acids of vegetable oils and fats and with an aliphatic sulphonic acid containing at least 7 carbon atoms, said condensation product being selected from the class consisting of amides, esters, ester amides and salts of amides, esters and ester amides.

8. The process of oiling and dressing fibers, which comprises treating fibers with an aqueous emulsion of a non-colouring condensation product of a hydroxy ethyl amine with oleic acid, said condensation product being selected from the class consisting of amides, esters, ester amides and salts of amides, esters and ester amides.

9. The process of oiling and dressing fibers, which comprises treating fibers with an aqueous emulsion of an amide of a hydroxy ethyl amine with oleic acid.

10. The process of oiling and dressing fibers, which comprises treating fibers with an aqueous emulsion of an ester amide of a hydroxy ethyl amine in which ester amide the hydroxy group of the original hydroxyethyl amine is esterified with oleic acid, and a hydrogen atom connected to the nitrogen atom of the original hydroxyethyl amine is substituted by an aliphatic sulphonic radicle containing at least 7 carbon atoms.

11. The process of oiling and dressing fibers which comprises treating fibers with a non-colouring condensation product of an alkylol amine with an aliphatic acid containing at least 7 carbon atoms, said condensation product being selected from the class consisting of amides, esters, ester amides and salts of amides, esters and ester amides.

12. The process of oiling and dressing fibers which comprises treating fibers with an aqueous emulsion of a non-colouring condensation product of an alkylol amine with an aliphatic acid containing at least 7 carbon atoms, said condensation product being selected from the class consisting of amides, esters, ester amides and salts of amides, esters and ester amides.

13. As new articles of manufacture fibers having a coating of a non-colouring condensation product of an alkylol amine with an aliphatic acid containing at least 7 carbon atoms, said condensation product being selected from the class consisting of amides, esters, ester amides and salts of amides, esters and ester amides.

14. As new articles of manufacture fibers having a coating of a non-colouring condensation product of an alkylol amine with an aliphatic acid containing at least 7 carbon atoms, said condensation product being selected from the class consisting of amides, esters, ester amides and salts of amides, esters and ester amides, and of another oiling agent.

15. As new articles of manufacture fibers having a coating of a non-colouring condensation product of an alkylol amine with an aliphatic carboxylic acid containing at least 7 carbon atoms, said condensation product being selected from the class consisting of amides, esters, ester amides and salts of amides, esters and ester amides.

16. As new articles of manufacture fibers having a coating of a non-colouring condensation product of an alkylol amine with an aliphatic

sulphonic acid containing at least 7 carbon atoms, said condensation product being selected from the class consisting of amides, esters, ester amides and salts of amides, esters and ester amides.

17. As new articles of manufacture fibers having a coating of a non-colouring condensation product of an alkylol amine with an aliphatic sulphonated carboxylic acid containing at least 7 carbon atoms, said condensation product being selected from the class consisting of amides, esters, ester amides and salts of amides, esters and ester amides.

18. As new articles of manufacture fibers having a coating of a non-colouring condensation product of a hydroxyethyl amine with a carboxylic acid containing at least 7 carbon atoms, obtainable from vegetable oils and fats, said condensation product being selected from the class consisting of amides, esters, ester amides and salts of amides, esters and ester amides.

19. As new articles of manufacture fibers having a coating of a non-colouring condensation product of a hydroxyethyl amine with a carboxylic acid containing at least 7 carbon atoms, obtainable from vegetable oils and fats, and with an aliphatic sulphonic acid containing at least 7 carbon atoms, said condensation product being selected from the class consisting of amides, esters, ester amides and salts of amides, esters and ester amides.

20. As new articles of manufacture fibers having a coating of a non-colouring condensation product of a hydroxyethyl amine with oleic acid, said condensation product being selected from the class consisting of amides, esters, ester amides and salts of amides, esters and ester amides.

21. As new articles of manufacture fibers having a coating of an ester amide of a hydroxyethyl amine, in which ester amide the hydroxy group of the original hydroxyethyl amine is esterified with oleic acid, and a hydrogen atom connected to the nitrogen atom of the original hydroxyethyl amine is substituted by an aliphatic sulphonic radicle containing at least 7 carbon atoms.

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