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CLEANING MEDIUM FOR ANIMAL AND
VEGETABLE TEXTILE FIBERS OR TEXTILE MATERIALS

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1 Claim. (Cl. 87-5)

The present invention relates to a method of cleaning animal and vegetable textile fibers or textile materials.

For the purpose of general preparation and for the removal of the mechanically adhering impurities and also the oil, fat, wax, resin or bitumen present in the natural state or added during the treatment, the vegetable or animal fibers required for the production of textile materials, or also the yarns, fabrics, etc. made from the same, are—mostly after a preliminary washing, digestion or roasting operation—treated with weak alkaline solutions or alkaline soap solutions at increased temperature. It has also been proposed to employ alkaline soaps with the addition of a small quantity of solvent for the same purpose.

Whereas, generally speaking, alkalis are deleterious to textile fibers as they act to reduce the breaking strength of the fibers, and make the same brittle and difficult to spin, there is more particularly in the case of animal fibers, for example raw wool, an additional weakening of the material by reason of the fact that the same is robbed by the alkali of the natural sulphur content, thus being deprived of its reducing property. Both raw wool as well as wool products or partly finished products are extremely sensitive to relatively high temperatures. The hydrolization products, which are particularly important as regards the feel, the strength and the finish of the wool are expelled by the heat, this also applying to the keratins, albumins, globulins, collagens and other albumen substances contained in animal and vegetable fibers and causing their elasticity. An additional disadvantage associated with the hitherto-known methods of cleaning raw fibers consists in the fact that any assailing fatty substances emulsify during the cleaning operation by reason of saponification resulting from the alkalis and alkaline soaps employed, and can only be removed again with a considerable amount of trouble, whereby impurification by reason of the fatty acids contained in the soap and likewise separated during this operation is not to be avoided.

The textile fibers, yarns, fabrics, etc. freed from all impurities and thoroughly washed may be subjected to the additional bleaching or other processes by treatment with bleaching agents acting in a reducing or oxidizing manner, or to any other desired treatment. The performance of the complete operation, which in reality consists of a number of consecutive digesting and cleaning processes, necessitates large and ex-

pensive apparatus and a considerable amount of space.

According to the present invention the fibrous material is accorded very extensive consideration and a much higher class product obtained by reason of the fact that both the use of alkalis or alkaline soaps as well as the application of increased temperatures is dispensed with, an acid preparing and cleaning agent, preferably in cold solution, being employed in place thereof. For removing the fatty impurities fat-dissolving agents of different kinds, or mixtures of these, are employed, converted into an emulsion by the use of a thickening vegetable mucus as protective colloid and stabilizer in acid dispersion, which emulsion may, if desired, be mixed with water.

The agent causing the dissolution of the oleous, fatty, waxy, resinous and bituminous substances consists of a mixture of volatile, organic fat-dissolving substances, the total density of which is approximately equal to that of the viscous dispersion agent.

The bleaching action on the raw or also pre-treated or partly worked fibers is produced by the use of a weak acid or an acid salt solution or any suitable compound or mixture, which is readily capable of being expelled by rinsing, and which induces the textile fibers to be opened out and thus give off the impurities they contain without disturbing the colloidal aggregation. We have discovered that, inter alia, the following substances are particularly suitable for the stated purpose: sulphurous acid, sodium bisulphite, hydrosulphite, chloro-sulphonic acid, boric acid, phosphoric acid, benzoic acid, formic acid, oxalic acid, tartaric acid, lactic acid or compounds thereof, if necessary with the addition of peroxides or other agents acting in an oxidizing or reducing sense. The nature and the quantity of the acid addition depends on the nature of the fiber and on the desired bleaching action.

According to the invention there is employed as emulsion negotiating medium between the fat solvent phase and the acid watery dispersion agent for forming the necessary colloidal fat solvent-in-water emulsion a proteinous vegetable mucus in a certain proportion suitable for producing a sol condition, and this may be gum, alga or also moss and tang mucusses, viz., mixed with each other or with one of the vegetable mucusses in a concentration producing a colloidal state. The homogeneous dispersion of the ingredients causing the cleansing of the fibers, which is thus obtainable, may, according to the invention, be

additionally stabilized by adding to the emulsion a certain quantity of alcoholic formalin solution until by reason of the same the stickiness and the water-solubility of the mucusses contained in the emulsion are in part again eliminated without affecting the gelatinous soak. In certain instances a satisfactory cleansing action in cold solution may be obtained by the liquid fat-dissolving agents and the proteinous vegetable mucusses alone, which are included in the cleaning agent, as the mucusses pick up and mechanically bind the fatty and other impurities separated from the fibers, and thus become charged with the same, so that these may be readily expelled upon the rinsing operation. It has furthermore been ascertained that this effect may be still further amplified by a small addition of sour milk or skimmed milk, the cleaning and bleaching effect of which may be assumed to be readily known, the milk proteins in conjunction with the proteins of the vegetable mucus improving the emulsion system.

This emulsion, containing more or less acid, may be mixed with water in any desired proportion, and may accordingly be readily converted into the diluted form necessary for use.

The solubility in respect of the fatty substance of the fibers is, by reason of the extremely intimate dispersion, which is obtained by the mechanical homogeneousness, of the atomized particles of solvent surrounded by a protective colloidal coating in the soaked viscous mucous solution, greater than when using the solvent alone.

A fine emulsion of this kind with colloidal dispersion is capable of penetrating deeply into the moist fibers and of there exerting a vigorous action in the dissolution of the fatty substances which may be present. The same accordingly fulfils the purpose of the alkaline soap lyes otherwise usually employed, but in more complete fashion and also in a manner which does not have the same detrimental action on the fibers. The solvent charged with the fatty substances and the like may be readily expelled from the fibers without trace by the use of cold rinsing water.

The mucous colloidal dispersion agent not only exerts a fixing action of the emulsified solvent on the fatty textile fibers, but also prevents too sudden action of the acid on the substance of the fibers. Due to the protein content of the vegetable mucus, the fibers are maintained in a pliable condition, as these fibers absorb said mucus after the fat has been removed. In this manner not only is the exposed fiber strengthened in its structure, but also the power of absorption and accordingly its dyeing capability and adaptability for spinning purposes are increased without losing in any way extensibility and weight, so that the fibers or fabric has a softer touch and a smoother and more glossy appearance.

An additional advantage associated with the use of the cleaning agent according to the invention consists in the combination thus rendered possible of the single preparing, cleaning and bleaching operations in one single process, the complicated cleaning operation distributed over a plurality of baths hitherto usual thus being unnecessary.

Apart from those fibers which may be placed under the general heading of textile fibers, and consisting for example of wool, silk, seed, bast, fruit, leaf, straw, wood and other cellulose fibers, it is also possible to clean with the method according to the invention other products or materials such as feathers, hair, furs, etc.

Examples of the solvent employed are quoted in the following:

Example 1.—40 parts of a 6% tragacanth solution are mixed with 15 parts of a 10% carrageen or Irish moss mucous solution and 10 parts of a 3% agar-agar solution and stirred with 25 parts of a mixture composed of heavy benzene and trichlorethylene, the specific weight of which at 15° is little more than 1, for instance, a mixture composed of 60% heavy benzene having 0.780/85 specific weight and 40% trichlorethylene. After the addition of a solution of 2 parts oxalic acid and 1 part sodium bisulphite in 6 parts of water vigorous stirring is performed, and when a homogeneous emulsion has been obtained one part of a mixture is added comprising formalin and butylalcohol in equal parts.

Example 2.—A further emulsion having a considerable solvent addition is produced by mixing 35 parts of a 9% tragacanth solution with a solution comprising 1 part tartaric acid and 5 parts of sour milk in 14 parts of water and stirring in 45 parts of a solvent mixture composed of equal parts of heavy benzene and trichlorethylene.

It will be understood that no restriction is made to the specific details described or to the examples above quoted, but that various modifications are quite possible within the meaning of the annexed claim without departing from the spirit of the invention.

What we claim as new and desire to secure by Letters Patent is:

A cleaning and purifying medium for animal and vegetable textile fibers and substances, consisting of an emulsion mixable with water and comprising an aqueous solution of an acid used as the dispersion medium, a volatile water-immiscible organic fat solvent used as the dispersed substance, a vegetable mucous substance acting as a thickening medium and used as the stabilizer of the emulsion, and sour milk.

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