Patented Mar. 28, 1939

2,151,952

UNITED STATES PATENT OFFICE

2,151,952

LUBRICATING TEXTILE FIBERS AND THE LIKE AND PRODUCT

Ludwig W. Wasum, Germantown, Pa., assignor to The Kessler Chemical Corporation, Philadelphia, Pa., a corporation of Maryland

No Drawing. Application August 8, 1938, Serial No. 223,699

10 Claims. (Cl. 28—1)

This invention relates to novel, efficient and economical procedure for the lubrication of textile fibers, such as natural fibers, in connection with the manufacture of combed or worsted yarn, and of synthetic yarns, such as rayon, and the like, in preparation for twisting or throwing. This invention also contemplates the novel lubricated fibers or yarn produced in accordance with the procedure.

Heretofore, as is well known, it has been necessary, in the manufacture of combed or worsted yarn, and the like, and in the twisting or throwing of synthetic yarns, as rayon, and the like, to lubricate the fibers or yarn in order that the fibers or yarn may freely pass and be worked upon by the mechanical instrumentalities used.

Heretofore textile fibers, synthetic yarns, and the like, have been lubricated variously with natural fatty acids, such as so-called olein, and fatty oils and it has been suggested that certain monovalent alcohol esters of fatty acids be used.

The natural fatty acids and fatty oils as heretofore used have proved sufficient for the purpose of lubrication, but have been variously open to very definite disadvantage in that their effect upon the mechanical instrumentalities is generally deleterious. The monovalent esters of fatty acids have proved of certain advantage, but have been found to be variously disadvantageous, more particularly in that they are to a degree uneconomic in that substantial quantities must be used to obtain the necessary lubricating effect.

Now in accordance with this invention procedure for the lubrication of textile fibers, synthetic yarns, and the like, and product thereof is provided which is at once highly efficient for treatment with the usual mechanical instrumentalities, highly economic in that a comparatively small amount of the lubricant is required and the lubricant may be readily and economically washed out.

In accordance with this invention lubrication of textile fibers, syntheiic yarns, and the like, is accomplished by treating the fibers, yarn, and the like, with a halogenated ester of a saturated or an unsaturated fatty acid.

Any of the halogenated esters of a saturated or an unsaturated fatty acid, formed by the reaction of an alcohol with a saturated or an unsaturated fatty acid and halogenated either after formation of the ester, or through the halogenation of either the alcohol or of the fatty acid, may be used.

Thus, by way of illustration the halogenated ester may be formed by reacting a monovalent or a polyvalent alcohol, such, for example, as ethyl, methyl, propyl, isopropyl, butyl, isobutyl, glycerol, sorbitol, mannitol, a glycol, as ethylene glycol, diethylene glycol, propylene glycol, and the like, etc. with a saturated or an unsaturated fatty acid, such as stearic, lauric, myristic, the acids derived from cocoanut oil, palm oil, soya bean oil, linseed oil, and the like, etc.

The ester may be formed in any manner well known to those skilled in the art. Thus, for example, the ester may be formed by reacting the alcohol and the fatty acid in suitable proportion, depending upon whether it is desired that the ester be neutral or on the acid side. Desirably, the esterification will be carried out in the presence of heat and of an esterification catalyst.

The halogenation of the ester may be accomplished with use of a halogen, as, for example, chlorine, bromine, iodine, etc. The halogenation, as has been indicated, may be accomplished in any usual manner well known to those skilled in the art and may be accomplished by halogenating the finished ester or by halogenating the alcohol or the fatty acid before reaction for the formation of the ester. The halogenation may be accomplished to an extent such as to produce mono-, di- or higher halogenated esters.

By way of more specifically illustrating this invention, the use of mono-, di- or higher chlorinated esters will be preferred. Preferably, a mono-, di-, or higher chlorinated monovalent alcohol ester will be used and as a specific example butyl dichlorstearate will be found to be highly efficient and economical for use.

In the procedure in accordance with this invention, the halogenated esters will be applied to textile fibers or synthetic yarns in the usual manner for lubricating or greasing, the yarns will then be processed mechanically in the usual manner and then washed for the removal of the halogenated ester. The halogenated esters indicated as used in accordance with this invention will be found to possess all the properties required of a lubricant for the purpose indicated. They will be found to have a low viscosity, to be liquid at ordinary temperatures and to be readily picked up by the fibers or yarn and they will not stain or discolor the fibers or yarn. The halogenated esters will be found to be stable, not to oxidize or become rancid and to have practically no odor. They can be prepared completely neutral or with any desired amount of free acid, as may be desired or indicated.

The halogenated esters contemplated will be found to have a high oily character such that much smaller quantity is required for the lubrication of a given amount of textile fiber or yarn than is required of the lubricating agents heretofore used and, indeed, it is surprising to note that due to the high oily character of the halogenated esters a much smaller quantity is required than in the case of the corresponding non-halogenated esters. The halogenated esters may be, where desired or indicated, mixed with other lubricating agents thereby making it possible where other lubricating agents are used, to reduce the required amount of such lubricating agents.

The halogenated esters will be readily emulsified and hence may be very readily and economically scoured out after the processing of the fibers or yarn.

What I claim and desire to protect by Letters Patent is:

1. The process of treating textile fibers, synthetic yarns, and the like, which includes applying thereto a halogenated fatty acid ester of an alcohol.

2. The process of treating textile fibers, synthetic yarns, and the like, which includes applying thereto a chlorinated fatty acid ester of an alcohol.

3. The process of treating textile fibers, synthetic yarns, and the like, which includes applying thereto a halogenated fatty acid ester of a monovalent alcohol.

4. The process of treating textile fibers, synthetic yarns, and the like, which includes applying thereto a halogenated fatty acid ester of a polyvalent alcohol.

5. The process of treating textile fibers, synthetic yarns, and the like, which includes applying thereto a chlorinated fatty acid ester of a monovalent alcohol.

6. The process of treating textile fibers, synthetic yarns, and the like, which includes applying thereto a chlorinated fatty acid ester of a polyvalent alcohol.

7. The process of treating textile fibers, synthetic yarns, and the like, which includes applying thereto a dihalogenated ester of a monovalent alcohol.

8. The process of treating textile fibers, synthetic yarns, and the like, which includes applying thereto a dihalogenated ester of a polyvalent alcohol.

9. The process of treating textile fibers, synthetic yarns, and the like, which includes applying thereto butyl dichlorstearate.

10. In combination, a yarn formed of fibrous material and a halogenated fatty acid ester of an alcohol coated on and intermingled with fibers of the yarn and in amount such as to lubricate the yarn to facilitate manipulation thereof by mechanical instrumentalities.

LUDWIG W. WASUM.