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TEXTILE MATERIAL AND ITS PREPARATION

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This invention relates to the treatment of yarns and filaments of organic derivatives of cellulose for the purpose of rendering them more readily delusterable wherein the treating material acts also as a lubricant.

An object of the invention is the economic and expeditious production of delustered textile materials. Other objects of the invention will appear from the following detailed description.

In the processing of substantially continuous filaments of organic derivatives of cellulose into yarns, threads and fabric, in various textile operations, such for example as twisting, doubling, hanking, rewinding, warping, weaving, knitting, netting and so forth, as also in the winding of the filaments in the manufacture of the filaments themselves, difficulties are liable to arise owing to hairing or fluffing of the yarns, etc., consequent on breakage of individual filaments, or to electrification of the yarns in travel or working or to tension and binding action caused in passing through guides, needles, etc. These occurrences may cause a substantial amount of waste, or hamper efficient working and detrimentally affect the quality of the goods produced.

I have found that these drawbacks can be overcome or greatly reduced and other beneficial properties imparted to the yarns, etc., by applying a special mixture comprising a lubricant and a phenolic body to the same during one of the winding operations, which mixture acts as a lubricant and a deluster promoting agent.

The dressing or coating applied to the yarns, threads, etc., lubricates them and prevents or reduces the tendency to hairing or fluffing or electrification in the manufacturing of the threads and in subsequent textile operations.

In the lubricating dressing is a deluster promoting agent that is held by the lubricant proper in contact with the yarn throughout the processing operation. Thus, yarn lubricated in this manner delusters very rapidly, evenly and completely when treated with scouring, dyeing or wet steam or other hot aqueous baths. The treated material is more rapidly "wet out" than material treated with known lubricants.

The deluster promoting agent contained in the lubricating dressing acts not only to speedily wet out and deluster the material to which it is applied but also acts as an aid or preservative for the lubricating ingredient of the dressing. Thus, the dressing on the treated yarn is stable and long delays may be made between processing steps without necessitating the relubrication of the material. The tendency of the lubricant to become oxidized or otherwise to deteriorate is greatly reduced.

Yarns and threads treated according to this invention are satisfactorily lubricated, so that they may be knitted into hose, or other circular knit fabrics or woven into fine fabrics free of defects. Materials made from yarns or threads treated according to this invention when treated with hot aqueous media deluster more quickly and slightly heavier than yarns merely treated with an oil. The yarns treated according to this invention also dye slightly heavier in shade than yarns treated by former methods.

The lubricating dressing aids in wetting out the materials. Thus hose or other fabrics made from the treated yarn may be dyed without prewetting out or treatment by a boil-off, and upon delustering, dyeing or other finishing treatments develop less creases than fabrics formed from other yarn.

According to this invention I apply a lubricant comprising a lubricant such as a vegetable, animal or mineral oil and a phenolic body, to the threads, yarns etc., whether in the course of production at the spinning cabinet or subsequently in preparation for or during any mechanical or hand textile operation.

The lubricating dressing may especially be applied to the yarns of associated filaments in the course of their production, whether formed by the wet or dry method of spinning, or it may be applied subsequently before or during any textile operations in which they are employed, especially those operations involving a winding operation. By applying the dressing in the course of production of the filaments, this application may suffice for the subsequent textile operations. If desired, however, a lubricating dressing as described may be applied both during the production of the yarns and later at any required textile operation.

The lubricating agent of the dressing is preferably olive oil, teaseed oil, castor oil or cotton seed oil. However, other lubricants may be used or mixed therewith such as petroleum jelly, animal fats and wax, glycols and polyhydric alcohols and similar lubricants. The vegetable oils lend themselves exceptionally well as a lubricant for organic derivatives of cellulose and these mixed with the phenolic body are made more stable and maintain their high lubricating properties for a long period of time.

The phenolic body preferably used to form the dressing is preferably cresylic acid (cresol). Cresylic acid may be used without danger to injuring

the yarns, it has a relatively high boiling point and remains on the yarn with the oil until removed by scouring. Scouring however, completely removes the cresylic acid and leaves no odor of same on the material. Cresylic acid may be safely used on yarns that are to be dyed with the water insoluble dyes customarily used to dye organic derivatives of cellulose without reacting or interfering therewith even when the dye bath is used as the scouring bath to remove the dressing. Although cresylic acid has the most advantageous properties as a constituent of the lubricating dressing other members of the phenolic family may be used such as phenols, xylenols, resorcinols, etc.

The particular nature of the dressing and the manner of applying it may vary considerably according to the particular textile operation in view of other circumstances. In 200 parts of the dressing there may be used from less than one to 50 parts and above of cresylic acid and from 199 to 150 parts a lubricating oil. There may be applied to the yarn any desired amount of dressing limited however by the consistency of the dressing. A dressing of mixtures of olive oil and cresylic acid may be applied in amounts of from, 1 to 4% the weight of the yarn, which amount is found sufficient for all ordinary textile operations.

In applying the dressing to the yarns in course of their production, the yarns of associated filaments, in their travel to the devices on which they are wound as produced, may pass in contact with pads, rollers, or other surfaces impregnated or supplied with the dressing, or through a bath of same, or the dressing may be sprayed on them in their travel.

When the dressing is to be applied to the yarns subsequently, they may be dipped in or treated therewith in hank or package form, or be wound off on to bobbins, cops, tubes, hanking frames, beams, rollers or the like in such a way as to pass in contact with finishing devices that may be rollers, discs, wicks, pads or other surfaces supplied or impregnated with the dressing, or through a bath or spray of the dressing on their way to the wind up device.

The lubricating dressing may be applied in concentrated form or as an emulsion or solution from suitable carriers and solvents. Thus a mixture of the lubricating dressing and a polyhydric alcohol, such as glycol, diethylene glycol or glycerine, may be employed. If the lubricating dressing is viscous, such as that formed by a heavy or semi solid oil, the same may be applied while hot.

The lubricating dressing may be removed from the yarns or fabric made therefrom in the manner heretofore used in connection with other lubricants. It may be removed in a soap bath, dye bath or other delustering baths. Such substances as tetralin (tetrahydronaphthalene) or pine oil may be used in the delustering bath. Upon the application of heated baths to the yarn or fabric the same is readily delustered and develops a soft smooth hand that readily takes dyes evenly and to a darker shade than normally treated yarns.

This invention is applicable to the treatment of yarns or filaments, under which terms are included, threads, assemblies or bundles of a number of continuous filaments which may be in parallel relationship or which may be twisted together, artificial bristles, straws, short lengths of staple fibres, or yarn spun from such staple fibres. This invention is also applicable to fabrics formed in whole or in part from such textile yarns and filaments and to films and foils.

This invention is applicable to yarns and filaments formed of organic derivatives of cellulose such as ethers and esters of cellulose. Examples of organic esters of cellulose are cellulose acetate, cellulose formate, cellulose propionate and cellulose butyrate while examples of ethers of cellulose are ethyl cellulose, methyl cellulose and benzyl cellulose.

The yarns or filaments may contain besides the organic derivative of cellulose, effect materials such as pigments, filling materials, dyes or lakes, fire retardants, plasticizers, sizes and lubricants. The effect materials may be incorporated with the yarns or filaments by adding same to the spinning solution from which they are formed or by swelling the filaments with a swelling agent and applying the effect materials to the filaments while they are in the swollen condition.

As description and not as limitations the following examples are given:

Example I

Cellulose acetate yarn, formed by the dry method of spinning i. e. by extruding a solution of acetone soluble cellulose acetate in acetone through suitable sized orifices into a heated atmosphere, is drawn from the spinning cabinet and caused to wipe across a wick that dips into a mixture consisting of 190 parts of olive oil and 10 parts of cresylic acid. The wick is suitably adjusted such that it furnishes 3% on the weight of the yarn of the mixture to the yarn.

The yarn is sufficiently lubricated to be knitted into a closely knitted fabric of fine stitch shape and may be woven into fabrics.

Example II

Example I is repeated using a mixture of 170 parts of olive oil or teaseed oil and 30 parts of cresylic acid. The same results are obtained.

Example III

Hose and fabrics knitted or woven from the above yarns are treated for from 10 to 30 minutes in a boiling water bath containing 5 grams per liter of soap. The material is found to be delustered heavily and evenly, free from objectionable odors and of a soft hand.

Example IV

Example III is repeated with 1 cc. per liter of tetralin and ½ cc. per liter of pine oil added to the delustering bath. The material is more heavily delustered than that of Example III.

The fabric of both Examples III and IV dye on a jig a slightly heavier shade and more rapidly than fabric not treated with the lubricating dressing of this invention.

Having described my invention, what I desire to secure by Letters Patent is:

1. Process of treating yarns containing organic derivatives of cellulose which comprises applying thereto prior to fabric formation a dressing comprising a water-insoluble lubricant and cresylic acid.

2. Process of treating yarns containing cellulose acetate which comprises applying thereto prior to fabric formation a dressing comprising a water-insoluble lubricant and cresylic acid.

3. Process of treating yarns containing organic derivatives of cellulose which comprises applying thereto prior to fabric formation a dressing comprising olive oil and cresylic acid.

4. Process of treating yarns containing cellulose acetate which comprises applying thereto prior

to fabric formation a dressing comprising olive oil and cresylic acid.

5. Process of treating yarns containing organic derivatives of cellulose which comprises applying thereto prior to fabric formation a dressing comprising a vegetable oil and cresylic acid.

6. Process of treating yarns containing cellulose acetate which comprises applying thereto prior to fabric formation a dressing comprising a vegetable oil and cresylic acid.

7. Process of treating yarns containing organic derivatives of cellulose comprising in an operation combined with the dry-spinning and winding of said yarns, the application thereto of a dressing containing olive oil and cresylic acid.

8. Process of treating yarns containing cellulose acetate comprising, in an operation combined with the dry-spinning and winding of said yarns, the application thereto of a dressing containing olive oil and cresylic acid.

9. Process of treating yarns containing organic derivatives of cellulose which comprises in an operation combined with the spinning and winding of said yarns, the application thereto of a dressing containing a vegetable oil and cresylic acid.

10. Process of treating yarns containing cellulose acetate which comprises in an operation combined with the spinning and winding of said yarns, the application thereto of a dressing containing a vegetable oil and cresylic acid.

11. A package of yarn of organic derivatives of cellulose comprising a water-insoluble lubricant and cresylic acid.

12. A package of yarn of cellulose acetate comprising a water-insoluble lubricant and cresylic acid.

13. A package of yarn of organic derivatives of cellulose coated with a vegetable oil and cresylic acid.

14. A package of yarn of cellulose acetate coated with olive oil and cresylic acid.

15. Process of treating yarns containing organic derivatives of cellulose, which comprises applying thereto prior to fabric formation a dressing containing a water-insoluble lubricant and 0.5 to 25% of cresylic acid.

16. Process of treating yarns containing cellulose acetate, which comprises applying thereto prior to fabric formation a dressing containing a water-insoluble lubricant and 0.5 to 25% of cresylic acid.

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