

UNITED STATES PATENT OFFICE.

CHARLES FIELD RYLEY, CHARLES WILFRED PALMER, AND SIDNEY ARTHUR WELCH,
OF SPONDON, NEAR DERBY, ENGLAND, ASSIGNORS TO CELANESE CORPORATION
OF AMERICA, A CORPORATION OF DELAWARE.

MANUFACTURE OR TREATMENT OF THREADS OF ARTIFICIAL FILAMENTS.

No Drawing. Application filed January 2, 1924, Serial No. 684,090, and in Great Britain January 26, 1923.

This invention relates to the manufacture or treatment of threads consisting of filaments of cellulose acetate or other cellulose esters, ethers or derivatives (all hereinafter included in the term organic derivatives of cellulose), produced by the dry or evaporative method, that is to say by extruding a solution of the cellulosic derivative or derivatives through fine orifices into the air or an evaporative atmosphere, to form filaments by evaporation of solvent, and associating the filaments into threads continuously with their formation, with or without twisting. Said evaporatively produced threads are known as and hereinafter included in the term dry-spun threads.

In the working up or application of said dry-spun threads in various textile operations, especially mechanical, such for example as twisting, doubling, hanking, rewinding, warping, weaving, knitting, netting and so forth, as also in the production and winding of the threads in the manufacture of the threads themselves, difficulties are liable to arise owing to hairing or fluffing of the threads consequent on breakage of individual filaments, or to electrification of the threads in travel or working. These occurrences may cause a substantial amount of waste or hamper efficient working, and detrimentally affect the quality of the goods produced.

It has now been found that these drawbacks can be overcome or greatly reduced by applying to the threads oily or like lubricating materials, such as vegetable or mineral oils, fats, or waxes, or emulsions of any of these.

According to the present invention we apply the oily or like lubricating material, such as vegetable or mineral oils, fats, waxes or emulsions, to the threads, whether in the course of their production or subsequently in preparation for or during any mechanical or hand textile operation. Mixtures of any of the said substances may of course be employed, or emulsions containing such mixtures.

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

The lubricating dressing may especially be applied to the threads of associated filaments in the course of their production, or it may be applied subsequently before or during any textile operations in which they are employed. By applying the dressing in the course of their production, this may suffice for the subsequent textile operations. If desired, a lubricating dressing of the character referred to may be applied both during the production of the threads and subsequently for any required textile operation.

By way of example, we may employ olive oil, or olive oil and oleic acid, or an emulsion thereof with potash soap or other soap; or castor oil, or other vegetable oil, or paraffin oil or other mineral oils, or emulsions of any of such oils; or fats may be used, such as lard, or lard and oleic acid, and so forth, either in the melted state or in the form of emulsions, or solid. In short any suitable oils, fats, waxes, emulsions or mixtures of a lubricating character may be employed.

The particular nature of the dressing and the manner of applying it may vary considerably according to the particular textile operations in view or other circumstances.

In applying the dressing to the threads in course of their production, the threads 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 oil, emulsion or other dressing, may be sprayed on to them in their travel.

When the dressing is to be applied to the threads subsequently, they may be dipped in or treated therewith in hank or like 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 rollers, pads or other surfaces supplied or impregnated with the dressing, or through a bath or spray of the dressing on their way on to the wind up device.

For many purposes the dressing may be applied in the form of a watery emulsion. One such emulsion may consist for example of olive oil, oleic acid and water. In other cases, where water emulsions are not desirable, for instance in preparing the threads for operations such as warp knitting, a dressing of

melted fat may be applied. Such a dressing may for instance consist of lard and oleic acid kept melted and applied to the threads by a roller revolving slowly in it and over which the threads are caused to travel.

In other cases a dressing of a mineral oil may be applied for example a heavy paraffin oil of good quality, such as medicinal paraffin oil.

When the dressing is of such a character as to obscure the lustre of the threads or impart an undesired smell to them this may be obviated by afterwards subjecting the threads or the fabrics made with them, to a scouring treatment, for example with a solution of soap and a little soda ash or other suitable scouring agent, to eliminate the oily, fatty or waxy material which it may be desired to remove.

The following are some examples of practical applications of the invention, it being understood that these are given only by way of illustration and that the invention is in no way restricted thereto.

Example 1. A lubricating dressing is employed in the form of a dry melted fat consisting of lard 1 part and pale oleic acid 1 part. This dressing is suitable for instance for warp knitting yarn and may be applied in a melted state for example by means of a roller revolving slowly in the melted fat and over which the yarns are led. The fabrics made with the dressed yarn may be scoured with soap and a little soda ash to restore the lustre of the yarn if desired.

Example 2. A lubricating dressing of olive oil may be applied to the threads or yarns by a pad, roller or otherwise.

Example 3. A heavy paraffin oil such as medicinal paraffin oil is employed, for example on a pad of cotton fabric, over which the threads or yarns are caused to travel.

Example 4. An olive oil emulsion is employed. For this purpose a stock emulsion may be prepared by thoroughly stirring 9 litres of a high quality neutral olive oil to which a little pure oleic acid, has been added, with about 1.4 kilos of caustic potash liquor (36 Bé.) and after some hours adding about 15 litres of boiling water very slowly while stirring. When all lumps are dissolved 25 litres of cold water are gradually added and the emulsion is stirred.

This emulsion may be employed in its alkaline form or with the addition of acids according to the character of the dyestuffs with which the yarns may have been dyed or other requirements.

One suitable dressing prepared from this alkaline stock emulsion may be made by adding stock solution to water so that the dilute liquor contains about 6 cc. of stock emulsion per litre.

Another suitable dressing may be made by diluting stock emulsion with water and add-

ing formic acid and tartaric acid, so that the liquor contains about 3 cc. stock emulsion, 1 cc. formic acid and 0.5 gram tartaric acid per litre.

In either case the yarns or threads may be dipped in hank form or otherwise in a bath of the dressing, or the same may be applied to the yarns or threads in any other way.

Example 5. A stock emulsion is prepared with 16 parts potash soft soap.

76 parts warm water.

4 parts olive oil.

4 parts pale distilled oleic acid.

A lubricating dressing, suitable for example as a preparation for machine knitting, is prepared by adding 1 part of the stock solution to 3 parts of water. This dressing may be applied to the yarns by dipping steeping them therein in hank or other form for a short time and afterwards allowing them to dry. Or the yarns or threads may be led over a roller revolving slowly in a less dilute bath, for example containing about 6.5 parts of the stock solution to 3.5 parts of water.

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

1. Process for the treatment of threads of organic derivatives of cellulose comprising, in an operation combined with the dry-spinning and winding of said threads, the application thereto of a lubricating dressing, whereby the threads are rendered amenable to the winding operation.

2. Process for the treatment of threads of organic derivatives of cellulose comprising, in an operation combined with the dry-spinning and winding of said threads, the application thereto of a lubricating dressing comprising a lubricating agent in the form of an emulsion, whereby the threads are rendered amenable to the winding operation.

3. Process for the treatment of threads of organic derivatives of cellulose comprising, in an operation combined with the dry-spinning and winding of said threads, the application thereto of a dressing comprising an oleaginous lubricating agent, whereby the threads are rendered amenable to the winding operation.

4. Process for the treatment of threads of organic derivatives of cellulose comprising, in an operation combined with the dry-spinning and winding of said threads, the application thereto of a dressing comprising an oleaginous lubricating agent in the form of an aqueous emulsion, whereby the threads are rendered amenable to the winding operation.

5. Process for the treatment of threads of organic derivatives of cellulose comprising, in an operation combined with the dry-spinning and winding of said threads, the application thereto of a lubricating dressing, whereby the threads are rendered amenable to the winding operation, and also the application of a lubricating dressing to the

threads subsequent to their removal from the dry-spinning apparatus.

5 6. Process for the treatment of threads of cellulose acetate comprising, in an operation combined with the dry-spinning and winding of said threads, the application thereto of a lubricating dressing, whereby the threads are rendered amenable to the winding operation.

10 7. Process for the treatment of threads of cellulose acetate comprising, in an operation combined with the dry-spinning and winding of said threads, the application thereto of a dressing comprising an oleaginous lubricating agent, whereby the threads

are rendered amenable to the winding operation.

8. Process for the treatment of threads of cellulose acetate comprising, in an operation combined with the dry-spinning and winding of said threads, the application thereto of a dressing comprising an oleaginous lubricating agent in the form of an aqueous emulsion, whereby the threads are rendered amenable to the winding operation.

25 In testimony whereof we have hereunto subscribed our names.

CHARLES FIELD RYLEY.
CHARLES WILFRED PALMER.
SIDNEY ARTHUR WELCH.