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UNITED STATES PATENT OFFICE.

GUILLAUME LARDY, OF PEAGE DE ROUSSILLON, FRANCE, ASSIGNOR TO SOCIETE POUR LA FABRICATION DE LA SOIE "RHODIASETA," OF PARIS, FRANCE.

PRODUCTION OF ARTIFICIAL YARNS OR THREADS.

No Drawing. Application filed April 6, 1926, Serial No. 100,177, and in France April 28, 1925.

In the textile industry, the application of a fugitive dye to textile fibres is frequently resorted to in practice, for the purpose of conferring on said fibres a temporary coloration enabling textile fibres of a different nature to be distinguished from one another, or from textile fibres of the same nature, but possessing different characteristics, such as a difference of grade or torsion, direction of twist, etc., or fibres of complex composition, obtained by assembling fibres of different natures or characteristics; this temporary coloration is subsequently removed when the moment is deemed suitable.

This practice, which, for the sake of simplicity, will be hereafter referred to as "shading," is particularly important in view of the considerable extension of the use of artificial silk and of the appearance on the market of cellulose acetate threads and fabrics.

This arises from the fact that artificial threads of different natures, even when they have different qualities to the touch, or as to their use, may occur with absolutely similar appearance, especially if these threads are, as frequently happens, sized in view of their subsequent use, or when they have been wound on supports such as reels or bobbins in view of their subsequent utilization in the manufacture of textile articles of all natures.

This similitude in the appearance of the thread is apt to cause confusion and give rise to mixtures or substitutions which are the more objectionable that threads of different chemical nature may have different susceptibilities to the dyes employed. If then, a mixture or a substitution has taken place in the course of the manufacture of a fabric, the error may only be detected after dyeing and may result in the necessity of dyeing again, or even in the rejection of the manufactured article. In any case, the error will cause a considerable depreciation of the final article.

It is therefore important that the "shading" should be carried out in such conditions that an absolute certainty is obtained that the totality of the thread subjected to the operation is effectively shaded, and that this shading has, at every point along the thread, a sufficient intensity to ensure a perfect security from errors.

Until now, the operation of "shading" has only been performed on finished threads, in hanks, or groups of hanks, or wound upon bobbins, which may give rise to irregularities in the shading, as the penetration of the dye may be incomplete inside the skeins or bobbins. In fact, when the thread has been put on spindles or spools, etc., it may happen that the visible portion of the thread is not shaded, or insufficiently so.

If, for instance, the operation is performed by dipping the hanks in a colouring bath, there may be unequal shading of the high and low portions, unless repeated displacements of the thread are resorted to, a manipulation which always affects adversely the subsequent operations to which the thread is subjected.

Similarly, if the "shading" be performed by spraying the hanks with a colouring solution, the layers of threads which rest on the rods or other supports for the hanks partly escape the shading, unless manipulations are resorted to, the purpose of which is to renew the surfaces offered to spraying, which manipulations also present the above inconvenience.

Applicant has now found that it is possible to obtain this "shading" of filaments, threads or other products obtained from any esters, ethers or cellulosic derivatives by the dry spinning process, by combining this operation with the production of these threads themselves, this "shading" being effected either on the elementary filaments before their joining together, or during or after this joining, on the moving threads formed by the association of these elementary filaments, before or during the reeling of these threads on the bobbining, twisting, hanking, etc. devices or any other winding arrangement.

This invention, which allows in this way the direct obtainment of a shaded thread, presents thereby all the advantages inherent to the suppression of a subsequent manipulation of the thread: economy of cost, gain of time, better quality of the thread which has been spared the causes of deterioration resulting directly or indirectly from the manipulation concerned.

Finally, it is evident that by means of the present invention, all the causes of irregularity of the "shading" mentioned above, are avoided.

The nature of the compounds or mixtures of compounds used for obtaining this "shading" (dyes, colouring matters, extract of whatever origin, state or composition) and

their condition of application are determined by the applications to which it is intended subsequently to submit the shaded threads, and by the chemical constitution of these threads.

These bodies or mixtures of bodies may be used, either in solution, suspension, emulsion, in any liquids or mixtures of liquids, solvents or non-solvents, volatile or not volatile at a determined concentration, in the state of pastes, jellies, coatings, or even in the solid state; they may be used with or without the addition of any bodies or mixtures of bodies intended to facilitate the application of the "shading" or even, if desired to facilitate any subsequent treatment to which the products obtained may be submitted.

One can use for the application of these compounds any desired device, for instance, the passage upon rolls, pads, or impregnated or soaked surfaces, passage through a trough, atomization, spraying, or rubbing on the product itself, alone or with the addition of other bodies these devices being used alone, or in groups or in combination with one another.

The devices used may be either inside or outside the spinning cells or chambers. The filaments or threads of several such cells may be brought together on these devices in order to submit them, either singly or together, to the "shading" on the same device, the threads being, if desired, subsequently separated.

In certain cases, the thread to be treated may be subjected to preliminary operations such as drying, damping, wetting, heating, etc., and afterwards one may repeat these operations, or others, the latter of which may have for their purpose to eliminate all or part of the constituents, to add others, or to cause the desired "shading" effect to appear or to fix this effect.

The present invention lends itself also to a special manner of "shading" for the differentiation of textile fibres in the case when, for instance, the number of dyes available is not sufficient to differentiate a great variety of textile fibres of different or of the same nature, but on which has been conferred, or it is intended to confer, different characteristics (grade, twisting, direction of twisting, etc.).

Systematic irregularities may then be introduced in the "shading," for instance, by shading definite lengths of thread with spacings, also of definite length, or by shading definite lengths of thread alternately with different dyes, or still by shading with a dye a portion of the elementary filaments, the other elementary filaments not being, or being differently, coloured.

It will be understood that by these diverse means, which are easily carried out by a suitable adaptation of shading devices, a considerable diversity in the appearance of the thread produced may be attained with a small number of dyes.

The following examples are given in order to illustrate the invention better, it being well understood that the scope of the invention is by no means restricted to the applications mentioned in them:

Example I.

In the spinning of a cellulosic ester by dry spinning, the elementary filaments or the threads composed of these filaments are caused to pass, during their production, upon a roll continuously impregnated with an aqueous solution containing 1% (more or less) of one of the following colouring matters:—

(St. Denis) Carmine blue (Schultz 543—Colour Index 712)

(B.A.S.F.) Brilliant carmine (Schultz 300—Colour Index 357)

(C.N.M.C.) Brilliant acid blue (Schultz 507—Colour Index 672)

(St. Denis) Amidonaphthol red (Schultz 66—Colour Index 57)

(C.N.M.C.) Brilliant milling green N.B. (Schultz 503—Colour Index 667)

(C.N.M.C.) Milling orange N.

(The above colouring matters are only given as an indication, and the dyes which can be used are, of course, not limited to these).

Example II.

On threads similar to those mentioned in Example I, a solution of one of the dyes cited above, or a solution containing in suspension a mineral colour, such as ultramarine, Guimet blue, red or yellow ochre, etc., is atomized and sprayed on the threads during their production, for instance, between the exit of the spinning cell and the winding device.

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

1. A process consisting in imparting to filaments and threads obtained by the dry spinning of cellulose derivatives a fugitive and temporary coloration for the purpose of differentiating textile fibres having different features, said coloration being applied on the moving threads in an operation combined with the production of said threads.

2. A process consisting in imparting to filaments and threads obtained by the dry spinning of cellulose derivatives a fugitive and temporary coloration for the purpose of differentiating textile fibres having different features, said coloration being effected on the elementary filaments before they are joined together.

3. A process consisting in imparting to filaments and threads obtained by the dry spinning of cellulose derivatives a fugitive and temporary coloration for the purpose of dif-

ferentiating textile fibres having different features, the coloration being imparted at predetermined intervals separated by predetermined intervals without coloration, for the purpose of differentiation of the threads with a restricted number of dyes.

4. The improvement in the manufacture of artificial silk which consists in facilitating the keeping apart of threads of different denier by wholly or in part dyeing the artificial silk during or after the spinning with a dye which is decolorized or removed completely or substantially completely by the breaching process or any other after-treatment.

In testimony whereof I have signed my name to this specification.

GUILLAUME LARDY.

CERTIFICATE OF CORRECTION.

Patent No. 1,693,759. Granted December 4, 1928, to

GUILLAUME LARDY.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, line 14, claim 4, for the misspelled word "breaching" read "bleaching"; same page, after line 15, insert the following as claim 5:

"5. A process which comprises dyeing filaments and threads obtained by the dry spinning of cellulose derivatives with a dyestuff capable of ready removal or discoloration for the purpose of differentiating textile fibres having different features, said dyeing being effected on the moving threads in the operation combined with the production of said threads".;

and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 28th day of May, A. D. 1929.

(Seal)

M. J. Moore,
Acting Commissioner of Patents.