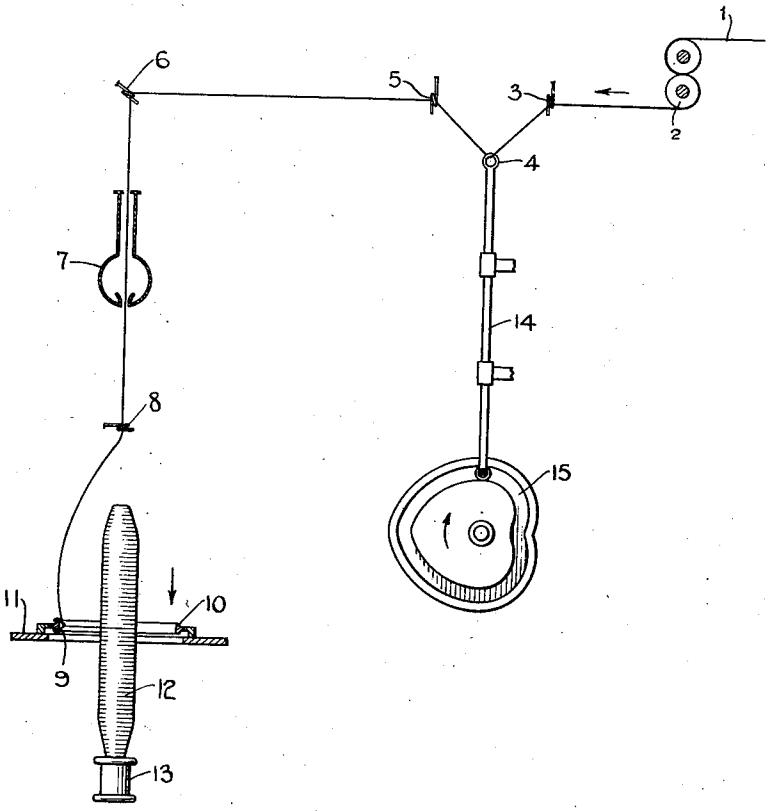
July 22, 1941. W. WHITEHEAD 2,249,875

TEXTILE PROCESS

Filed April 30, 1940



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Patented July 22, 1941 2,249,875

UNITED STATES PATENT OFFICE

2,249,875

TEXTILE PROCESS

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Application April 30, 1940, Serial No. 332,453

6 Claims. (Cl. 57—157)

This invention relates to a method of treating yarns and relates more particularly to a method of imparting a uniform twist to yarns which are to be used in the weaving of crepe fabrics.

An object of this invention is the preparation of highly twisted organic derivative of cellulose and other thermoplastic yarns which are twisted to a uniform degree.

Another object of this invention is the preparation of said highly twisted yarns for the weaving of crepe fabrics.

Still another object of this invention is the preparation of crepe fabrics from said yarns which are substantially free of barres and other irregularities in the weave.

Other objects of this invention will appear hereinafter from the following detailed description.

Fabrics exhibiting crepe effects have been obtained by using in their construction highly twisted yarns of natural silk and subjecting the fabrics so formed to an aqueous scouring treatment. The resulting fabrics have a very pleasing appearance and handle and find extensive use in industry. The production of crepe fabrics from organic derivative of cellulose yarns has also been accomplished, but this has been done not only by imparting a high twist to the yarns but also by subjecting them to steaming in the presence of moisture while inserting the twist therein. The presence of the desired moisture may be assured by arranging for condensation of steam in the steaming device or dry steam may be passed through water so as to saturate the steam and the requisite moisture produced by cooling in the steaming device. The requisite moisture may also be obtained by wetting the yarn before it enters the steaming chamber. Steam at atmospheric pressure or slightly higher is suitable and the steam is applied to the yarns over at least a portion of that part of its track in which twisting takes place. By this method it has been possible to produce crepe yarns which yield fabrics exhibiting excellent crepe effects when given a hot aqueous treatment. The yarns produced in this manner are much stronger and yield better crepe effects than those produced without steaming during the twisting operation.

Various means may be used for imparting the desired twist to the yarns. The twist may be imparted to the yarn while drawing it over the edge of a rotating package or else the twist may be imparted to the yarn by means of a ring twister, cap twister or in any other suitable manner.

While fairly desirable yarns and crepe fabrics may be obtained when using these various twisting devices, where a ring or cap twister is used to impart the necessary high twist to the organic derivative of cellulose or other thermoplastic yarns, it has been found that fabrics woven from the resulting yarns are not as uniform and free from defects as is desired. When these yarns are woven into a fabric, barres and other undesirable effects are frequently present in the finished crepe fabric.

I have now discovered that barres and other irregularities in crepe fabrics woven from highly twisted organic derivative of cellulose yarns prepared by using a ring twister in the crepe twisting operation, may be eliminated. Said defects may be avoided by maintaining the distance between the yarn feed rollers and the ring rail constant during the crepe twisting operation, regardless of the rising and falling motion of the ring rail as the package is being wound. This results in a yarn in which the twist is uniform along its entire length.

Yarns which are being crepe twisted are subjected to a high degree of twist which may vary from about 50 to about 100 turns per inch or more. Consequently, any variation in the length of yarn between the ring rail and the yarn feed rollers will result in a corresponding variation in the uniformity of twist imparted to the yarn. Since the spindle speed and the yarn feeding speed are constant, the repeated shortening and lengthening of this distance in the ordinary ring twister as the ring rail rises and falls will repeatedly shorten and lengthen the amount or length of yarn subject to the twisting action at any given instant. This variation results in an uneven degree of twist in the yarn. I have discovered that this variation in twist is the cause of barres and other irregularities when the yarn is woven into fabric and the fabric subjected to a creping bath. When the twist put into the yarn is uniform and without any variations, barres and other irregularities do not occur or to only a very slight degree.

The constant distance between the ring rail and the yarn feed may be maintained by a compensating yarn guide which is coordinated by a cam or cams to the motion of the ring rail so that the yarn guide takes up the slack portion in the yarn as the ring rail rises, and releases the take-up yarn as the ring rail drops, thus maintaining constant the length of yarn between the ring rail and the feed rollers. Other mechanical means which accomplish the same result are obviously equally suitable.

An embodiment of a means whereby my invention may be carried out is shown in the accompanying figure.

The organic derivative of cellulose yarn 1 which is to be crepe twisted is fed to rotating feed rollers 2, through yarn guides 3, 4, 5 and 6. The yarn after it leaves guide 6 passes vertically downwardly through a steam chamber 7 where it is subjected to the action of moist steam. After

passing through the steaming chamber 7, the yarn passes through a guide 8 and then through a traveler 9 mounted on ring 10 attached to a ring rail 11 which traverses upwardly and downwardly to wind the yarn on to the package 12. The high speed whirling motion of the package 12 mounted on a spindle 13 serves to impart a high degree of twist to the yarn while it is being wound. The yarn guides 6 and 8 are preferably so arranged with respect to the steam chamber 7 that at least a portion of the twist given to the yarn is imparted while the yarn is being subjected to steaming.

The traversing upward and downward motion of the ring rail 11 carries ring 10 with it and results in an alternate increase and decrease in the length of the yarn between the feed rollers 2 and the ring 10. This alternate change in length is compensated for by a rod 14 attached to yarn guide 4 and riding on a cam 15. The cam 15 is so shaped and operated that the rod 14 rises and falls in timed relation to the movement of the ring rail 11, that is, as the ring rail 11 rises the rod 14 is lowered. The yarn length between the yarn feed rollers 2 and ring 10 is thereby maintained constant, thus resulting in the application of a high twist uniformly to the yarn. The crepe fabric woven from yarns which are crepe twisted in this manner are substantially free of barres and other irregularities.

The means shown in the accompanying drawing are merely illustrative of one arrangement whereby the primary object of maintaining the constant yarn distance may be achieved. Other arrangements and means for effecting the object of the present invention can, of course, be used.

Yarns consisting of or containing various organic derivatives of cellulose may be treated in the manner described. Not only may yarns composed of cellulose esters, such as cellulose acetate, cellulose propionate, cellulose butyrate and mixed esters, such as cellulose acetate-propionate, be treated, but cellulose ether yarns such as ethyl cellulose, methyl cellulose and benzyl cellulose may also be so treated. Likewise, yarns of other thermoplastic materials such as those made of synthetic linear polyamide condensation products and vinyl chloride-vinyl acetate copolymers may also be twisted in this manner.

It is to be understood that the foregoing detailed description is merely given by way of illustration and that many variations may be made therein without departing from the spirit of my invention.

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

1. Process for the production of highly twisted crepe yarns of artificial filaments, said process comprising steaming yarns of artificial filaments while they are travelling to an axially stationary package, whereby they are received on said package while they are still under the influence of steam, rapidly rotating said package about its axis so as to impart a crepe twist to said yarns as they are collected on said package, traversing the yarns to and fro along the length of the package, and maintaining constant the length of yarn between the yarn feed and said take-up package.

2. Process for the production of highly twisted crepe yarns of artificial filaments comprising organic derivatives of cellulose, said process comprising steaming yarns of artificial filaments comprising organic derivatives of cellulose while they are travelling to an axially stationary package, whereby they are received on said package while they are still under the influence of steam, rapidly rotating said package about its axis so as to impart a crepe twist to said yarns as they are collected on said package, traversing the yarns to and fro along the length of the package, and maintaining constant the length of yarn between the yarn feed and said take-up package.

3. Process for the production of highly twisted crepe yarns of artificial filaments comprising cellulose acetate, said process comprising steaming yarns of artificial filaments comprising cellulose acetate while they are travelling to an axially stationary package, whereby they are received on said package while they are still under the influence of steam, rapidly rotating said package about its axis so as to impart a crepe twist to said yarns as they are collected on said package, traversing the yarns to and fro along the length of the package, and maintaining constant the length of yarn between the yarn feed and said take-up package.

4. Process for the production of highly twisted crepe yarns of artificial filaments, said process comprising steaming yarns of artificial filaments while they are travelling to an axially stationary package, mounted in a ring spinning device, whereby they are received on said package while they are still under the influence of steam, rapidly rotating said package about its axis so as to impart a crepe twist to said yarns as they are collected on said package, traversing the yarns to and fro along the length of the package, and maintaining constant the length of yarn between the yarn feed and said take-up package.

5. Process for the production of highly twisted crepe yarns of artificial filaments, comprising organic derivatives of cellulose, said process comprising steaming yarns of artificial filaments comprising organic derivatives of cellulose while they are travelling to an axially stationary package, mounted in a ring spinning device, whereby they are received on said package while they are still under the influence of steam, rapidly rotating said package about its axis so as to impart a crepe twist to said yarns as they are collected on said package, traversing the yarns to and fro along the length of the package, and maintaining constant the length of yarn between the yarn feed and said take-up package.

6. Process for the production of highly twisted crepe yarns of artificial filaments comprising cellulose acetate, said process comprising steaming yarns of artificial filaments comprising cellulose acetate while they are travelling to an axially stationary package, mounted in a ring spinning device, whereby they are received on said package while they are still under the influence of steam, rapidly rotating said package about its axis so as to impart a crepe twist to said yarns as they are collected on said package, traversing the yarns to and fro along the length of the package, and maintaining constant the length of yarn between the yarn feed and said take-up package.

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