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METHOD OF PRODUCING IMPROVED YARN

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Fig. 1.

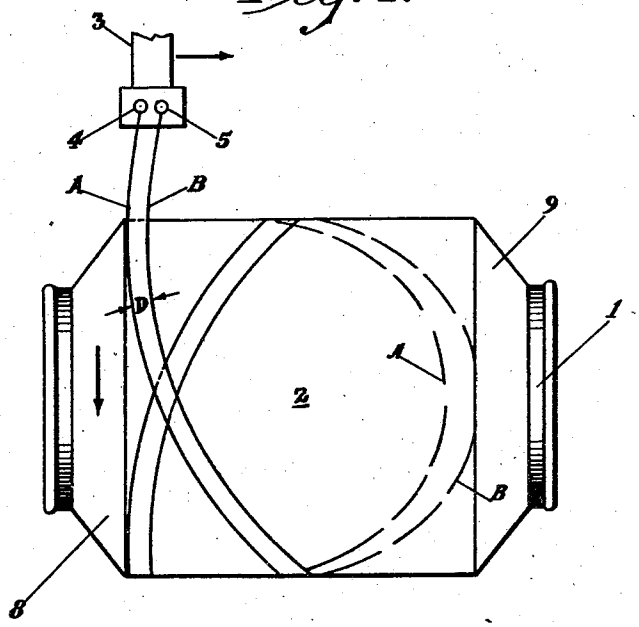
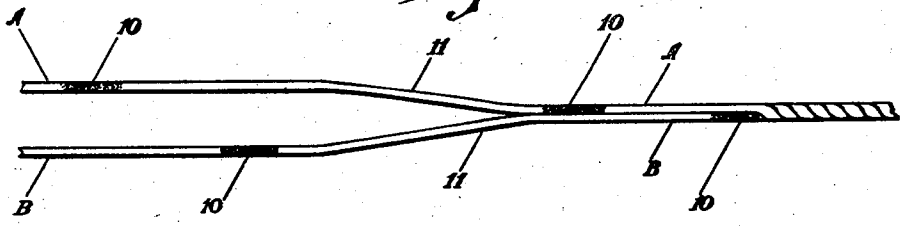


Fig. 2.



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METHOD OF PRODUCING IMPROVED YARN

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2 Claims. (Cl. 57—156)

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This invention relates to continuous filament spun yarn and has for its objects the provision of an improved yarn and an improved method of producing the yarn. Spun yarn that is wound on bobbins while in a fresh state does not have the same dye affinity at the edges or shoulders of the package that it has in the interior of the package because of a differential in certain chemical and physical actions during the preparation, purification and drying of the spun yarn package. As a result of this difference in dye affinity, there are repeated short length variations in the yarn which may vary in length from a fraction of an inch to several inches. This undesirable dyeing characteristic is often referred to as "shoulder effect." In the cloth prepared from the yarn, these short length variations are frequently arranged in pattern formations, known as "streaks," "barre" and "moire," which degrade the appearance and quality of the cloth. My invention is concerned with the provision of a yarn in which the intensity of the shoulder effect is reduced to an unobjectionable defect.

The invention provides a blended yarn formed of two or more yarns in which those portions of each yarn having the shoulder effect are placed alongside a portion of the other yarn having normal dye affinities and, when the yarns are dyed, the undesirable dye character of the shoulder effect is reduced to a marked extent by the normal dyeing yarn blended therewith. The invention provides an orderly and positive means of bringing together two or more yarns in such side-by-side relation that there is a uniform blending of the yarns with respect to their dyeing properties. The invention provides a simple and economical method of plying the yarns on ordinary textile winding equipment. In accordance with the invention, two or more yarn ends are spun and formed into a single package, as on a single bobbin, in such spaced relation that the portions of one yarn having the shoulder effect are staggered with respect to the portions of the adjacent yarn having the shoulder effect. Both yarns are unwound in a plying operation advantageously carried out simultaneously with the twisting of both yarns into a single yarn. It is one of the important characteristic features of this invention that the undesirable dyeing sections of one yarn are definitely blended with the desirable dyeing sections of the other yarn.

In winding two yarn ends on a single bobbin during the spinning operation, for example, the traverse is provided with two guides so spaced apart as to lay the two yarns in side-by-side relation, one leading the other, to the end that only one yarn forms the shoulder at one end of the package while the other yarn forms the shoulder at the other end of the package. In removing the two yarns and bringing them together without longitudinal displacement, the yarn at the shoulders must lie side-by-side with yarn from the interior of the package.

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These and other objects of the invention will be better understood after considering the following discussion taken in conjunction with the accompanying drawing, in which:

Fig. 1 is a somewhat diagrammatic illustration of a yarn package in the process of formation in accordance with a method of the invention, and

Fig. 2 is a diagrammatic sketch of a blended yarn of the invention.

As shown in Fig. 1, the bobbin 1 of usual construction, such as an aluminum cylinder, has wound thereon a yarn cake or package 2 of conventional shape. The yarn cake is almost completely wound and comprises two yarn ends A and B being laid in spaced side-by-side position by the traverse guide 3 which has separate guide openings 4 and 5 spaced apart, in the direction of travel of the traverse guide, the distance D required between the yarns A and B.

The sloping shoulders 8 and 9 are the parts of the package where the so-called "shoulder effect" occurs and the cylindrical part therebetween is the part which has the desired or normal dyeing properties. As shown in Fig. 1, the traverse guide is just starting its return to the right, the yarn end A having reached the position in which it forms the shoulder 8. Yarn end B at this point is spaced inward the distance D and does not reach the shoulder 8 and acquire the shoulder effect. As the traverse guide carries the yarn ends to the right, the shoulder 9 is finally reached and the yarn end B forms the shoulder 9. At the point where end B forms shoulder 9, the end A is spaced inward the distance D and does not acquire the shoulder effect on this end of the package. This operation is, of course, repeated for each layer of yarn.

Fig. 2 is a diagrammatic illustration of a blended yarn of the invention in various stages after removal of yarns A and B from the package. The shaded portions 10 have the shoulder effect and the clear portions 11 respond to normal dyeing. The two yarns are brought together with a staggering of the portions 10 and 11 of one yarn with respect to portions 10 and 11 of the other yarn. This perfect blending happens with certainty and in a precise manner by reason of the

precise relationship between the two yarns on the bobbin and their manner of removal and blending. The right-end portion shows the two yarns twisted together into a blended yarn of the invention. Any suitable number of yarns may be combined in this manner. The invention may also be applied to pot spun packages.

One of the important features of the invention is that the plying operation in blending the two yarns may be accomplished simultaneously with a twisting operation, advantageously on a conventional upstroke type twisting machine.

The following are examples of operations embodying the invention:

Two separate viscose yarns 75 denier, 20 filaments, were spun and the two yarns were wound on a single bobbin as in Fig. 1, washed free of acid, desulfurized by the conventional vacuum washing process, and then dried on the metal bobbin in hot air. About 300 meters of both yarns were reeled off the outside of the spin package. The remainder of the spin package was placed on the spindle of an upstroke twister and the two ends were plied while simultaneously inserting three turns of twist per inch. Following this, the plied 150 denier, 40 filament yarn was preshrunk in cake form, wound into cones and processed into fabric by the usual textile methods.

In another example, a package was formed of two yarn ends as in the previous example. The two ends were plied and twisted simultaneously on a ring twister by delivering the two ends simultaneously over the end of the spin package, joining them together on the draft rolls, and winding the plied 150 denier, 40 filament yarn onto a ring twister take-up bobbin in the conventional manner. Following this, the plied yarn was backwound into cake form, preshrunk, wound into cones, and woven into fabric.

In both examples, the plied yarn was woven as filling in a taffeta construction. The fabric was scoured and dyed by conventional methods and then was inspected for uniformity of dye affinity. The fabric was found to possess a smooth appearance, having a uniform acceptance of dyestuff. It was notably free of the customary short length variations in dye affinity often referred to as "short streakiness" and "barre" which are attributable to shoulder effect. Direct comparisons of the plied yarn of the invention with yarn spun and processed under the same conditions that existed for the plied or blended yarn but which was spun and processed in the conventional manner as a single end showed the fabric prepared of the plied yarn to be markedly improved in dye uniformity over that prepared of the conventional yarn. Furthermore, similar tests showed the same improvement of the plied yarn over either of the two ends of the spin bobbin if they were not plied but each wound onto separate bobbins in a winding or twisting operation.

I claim:

1. Method of producing an improved yarn, which comprises simultaneously spinning two separate yarns, forming a package of said separate yarns by cross-winding the same on to said package while maintaining said yarns in a spaced relation at all points of the package and in such a manner that one yarn forms a shoulder at one end of the package while a different yarn forms a shoulder at the other end of the package and then removing said yarns from the package and simultaneously twisting the same so as to form a blended yarn in which the portions of the yarn at the shoulders are staggered with respect to each other in the blended yarn.

2. Method of producing an improved yarn, which comprises simultaneously spinning two separate yarns, forming a package of said two separate yarns, concurrently with the spinning thereof, by cross-winding the same on to said package while maintaining said yarns in a spaced relation at all points of the package and in such a manner that one yarn forms a shoulder at one end of the package while a different yarn forms a shoulder at the other end of the package and then removing said yarns from the package and simultaneously twisting the same so as to form a blended yarn in which the portions of the yarn at the shoulders are staggered with respect to each other in the blended yarn.

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