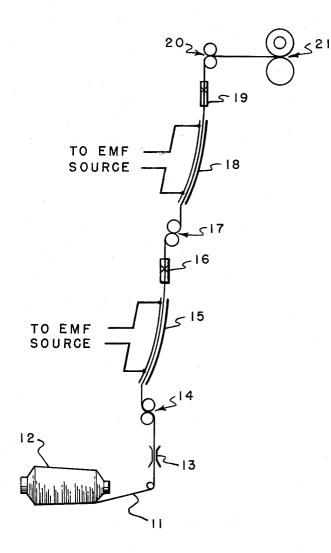
3,137,119 C. CROUZET PROCESS FOR THE PRODUCTION OF HIGH BULK YARNS

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3,137,119 PROCESS FOR THE PRODUCTION OF HIGH BULK YARNS Charles Crouzet, Riorges, Loire, France, assignor to

Charles Crouzet, Riorges, Loire, France, assignor to Moulinage et Retorderie de Chavanoz, Chavanoz, Isere, France, a French corporation Filed June 14, 1961, Ser. No. 117,157 2 Claims. (Cl. 57—157)

This invention relates to the production of improved 10 high bulk yarns and to apparatus for that purpose.

High bulk yarns, particularly those consisting of synthetic polymers, are customarily made by inserting in the yarn a high twist, setting the twist and untwisting. These operations were originally carried out as separate processes but are now effected in a more economic way by applying a false twist to the yarn, allowing that false twist to run back into a setting zone and then winding the yarn, the false twist having run out of the yarn.

High bulk yarns produced by such twisting processes 20 whether of the old discontinuous type or of the modern false twist type tend to twist on their axes despite the fact that they have no real twist or very little real twist in them. This effect is commonly described as a torque effect. The direction of the torque depends on whether 25 S twist or Z twist is imparted to the yarn in the original twist or false twisting operation. This torque tends to cause deformation of a fabric made from the yarn, particularly in knitted fabrics. In woven fabrics the effect may be overcome by adopting the procedure used in the 30 making of crepe fabrics, either by associating the S yarn with a Z yarn in a 2-ply assembly or by weaving the S and Z yarns alternately into the fabric.

Thermal treatment of the yarn does help to reduce this torque effect but, on the other hand, it tends to reduce the 35 high bulk of the yarn.

According to the present invention, the torque effect is reduced by applying to the yarn a further twisting operation in the reverse direction to the torque and also a setting treatment. Where the twist is applied as a true twist the 40 yarn may be untwisted after the setting operation. Preferably, however, a false twist is applied and is allowed to run back into a setting zone. Thus the final yarn again has no twist and has the advantage of the present invention of showing a reduced torque effect. 45

The most advantageous method according to the present invention is to combine the high bulking operation with the operation of reducing the torque so that both are applied in a single run of the yarn. In such a single run, both the high bulking process and the torque reducing 50 process involve false twisting. Such false twisting is preferably combined with setting by running the yarn in contact with a stationary convex surface, such as a Ushaped channel heated directly by the passage of electric current therethrough, or a longitudinally convex tube also beated directly by the passage of electric current therethrough.

The apparatus of the present invention comprises in series a setting zone, a false twister, a yarn feeding device, a second setting zone and a second false twister. In 60 such an arrangement of the false twisters and two setting zones in series, it is essential to have a positive yarn feeding device between the first false twister and the second setting zone. Before the first setting zone there is preferably a positive yarn feed device feeding the yarn 65 through a suitable tension gate or other tension device from a suitable package and subsequent to the second

false twister there is preferably a further yarn feeding device feeding to the take-up package.

The invention is illustrated in the accompanying diaagrammatic drawing of a preferred embodiment according to the invention.

According to this preferred embodiment of the invention a yarn 11 of 70 denier and 50 filaments, made of polyhexamethylene adipamide, is unwound endwise from a package 12, carried through a tension device 13 to a positive yarn feeding device 14. Thence the yarn passes through a longitudinally convex tube 15 heated as by the passage of an electric current therethrough and the yarn makes contact with the inside surface of the tube. The yarn is then carried to a false twister 16 so positioned that the false twist runs back into the setting zone 15 and the twist in the yarn at the end of that setting zone is set. The yarn then passes to a further yarn feed device 17 thence through a second longitudinally convex tube 18 heated by electric current, through a second false twister similarly placed with respect to its setting zone, and to a yarn feed 20 and wind-up 21.

In practice the false twist imparted by the second false twisting device 19 is just that amount required to remove or substantially remove the torque in the yarn coming from the feed device 17. This false twist may be equal to, higher than or lower than the false twist imparted by the first false twister 16 but in general it is lower. Similarly, the temperature in this second setting zone (heater 18) is generally lower than that of the first setting zone defined by heater 15.

As an example of operation of the apparatus according to the invention, using the yarn mentioned above, the feed device 14 may be rotated to give a yarn speed of 20 metres per minute; the temperature of the first setting zone 15 may be 230° C.; and the speed of the false twister 16 may be 70,000 r.p.m. The peripheral speed of the yarn feed device 17 should be 2% below that of yarn feed device 14. The speed of the second false twister may be 48,000 r.p.m. and of course the rotation is in the opposite direction to that of false twister 16. Finally, the peripheral speed of yarn feed device 20 may be 16.5 metres per minute and the take-up 21 may be 16 metres per minute. This differential between feed and take-up rates ensures that the take-up package is not excessively hard.

While a single preferred embodiment constructed according to the invention has been illustrated and described in detail, together with the preferred mode of practicing the process according to the invention, it will be apparent to those skilled in the art that various modifications and improvements may be made without departing from the scope and spirit of the invention. Accordingly, the invention is not to be limited by the particular illustrative embodiment but only by the scope of the appended claims.

That which is claimed is:

1. Process for the production of high bulk yarns having a reduced torque effect, comprising positively feeding a yarn to a first false twisting zone, applying to said yarn a false twisting in one direction and setting that false twist by allowing it to run back into a preceding setting zone, then positively feeding the yarn to a second setting zone and a second reverse twist false twisting zone while permitting the reverse false twist to run back into said second setting zone the amount of the reverse false twist being less than that of the first false twist and the second setting zone being at a lower temperature than said first setting zone, and thereafter positively feeding said yarn to a take-

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up packing and collecting the yarn, the yarn in each of said succeeding feeding steps being fed at a lower speed than in the preceding feeding step, the yarn speed to said sec-ond setting zone being about 2% less than the speed at which the yarn is fed to the first setting zone. 2. Process according to claim 1 wherein the yarn is composed of synthetic polymer which can be heat set.

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Refe	ences Cited in the file of this patent
	UNITED STATES PATENTS
2,891,375 2,958,921	Vandamme et al June 23, 1959 Gilchrist et al Oct. 8, 1960
_,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	FOREIGN PATENTS
788,944	Great Britain Jan. 8, 1958