United States Patent [19]

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[11] **3,774,383**

[45] **Nov. 27, 1973**

[54] **PROCESS FOR TEXTURIZING SYNTHETIC YARNS**

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[22] Filed: **Dec. 20, 1971**

[21] Appl. No.: **209,945**

[52] **U.S. Cl.** ..... **57/34 HS,** 57/157 TS

[51] **Int. Cl.** **D02g 1/04**

[58] **Field of Search** ..... 57/34 R, 34 HS, 157 TS, 57/157 MS, 157 R

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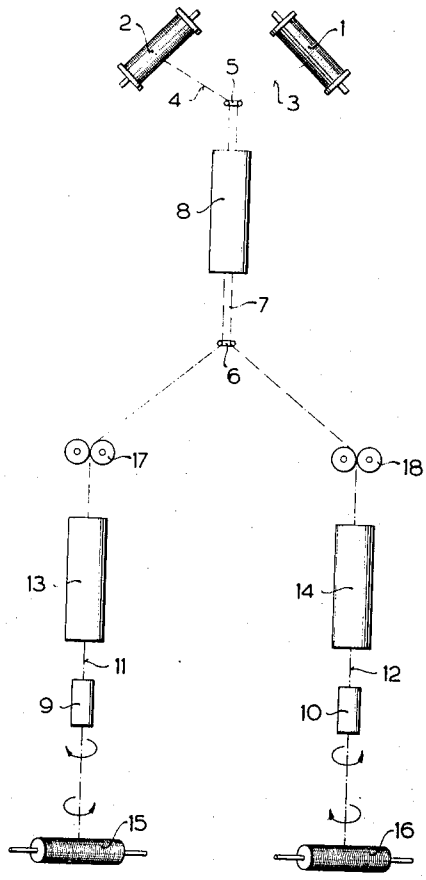
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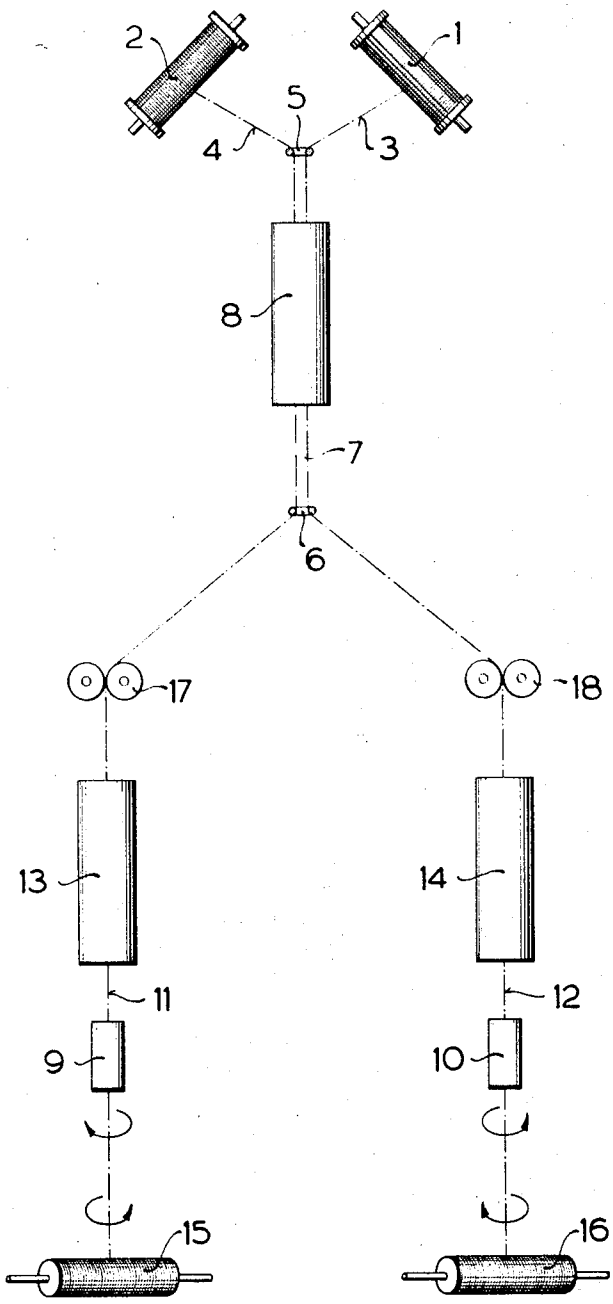
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[57] **ABSTRACT**

Texturizing synthetic yarns to afford the knit fabric produced from such yarns with a high degree of elasticity and good transparency is achieved by a thread separating process so that after separation of the entwined portion and before winding on spools, each yarn is subjected over a further stretch to another texturizing at the same velocity of travel. The texturizing that follows thread separation is achieved by twisting and heat fixation.

2 Claims, 1 Drawing Figure




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PROCESS FOR TEXTURIZING SYNTHETIC YARNS

BACKGROUND OF THE INVENTION

The invention deals with a process for the texturizing of synthetic yarns, in which a thread is entwined over a certain stretch with itself or with other threads, heated, fixed and the intertwining is separated before the yarn or yarns are wound.

The texturizing of synthetic yarns or bundles of yarns leads to an orientation of the molecules of the yarn brought about by the process in question. This orientation determines the plasticity of the yarns, and also the density and direction of elasticity of a product made of such yarns. If one is dealing with yarns, for instance polyamide yarns, that are knitted into women's hose, on the one hand the greatest possible elasticity will be required of the knit fabric in both directions, in order that the hose fit the shape of the leg as far as possible without wrinkling, and on the other hand prevailing tastes require the greatest possible transparency of the hose. This is the lower, the more crinkling there is as a result of texturizing of the yarns.

In the separating processes used and already known for texturizing yarns a twisted yarn is obtained with relatively numerous twists per length unit. This leads to relatively pronounced crinkling. This is due to the relatively high velocity of the yarns which can be achieved over the thread length. This also makes the process particularly economical. In addition it yields a relatively uniform texturization, because the twining can easily be maintained between the thread guides and is not subject to slippage. For this reason, yarns of this type can be knitted relatively easily. If the crinkling of the yarn is pronounced, however, the transparency of the knit fabric is unsatisfactory.

In addition to the thread separating process, there are various other processes for texturizing synthetic yarns. In the crush-crinkling process, the yarn is pressed together in a crushing chamber and is texturized thereby. In the blow process, the crinkling effect produced is the result of the action of a turbulent zone which the yarn must traverse. In the pulling process already known, on the other hand, the yarn is crinkled as a result of being pulled over a cutting edge. One of the most frequently used texturizing processes in the production of synthetic yarns, however, consists of false twisting of the yarns and the crinkling caused thereby.

With this process, on one side of the false thread spindle there is, for instance, an S-shaped twist of the yarn, which is offset on the other side by a Z-shaped twist of the yarn. The crinkling obtained depends upon the velocity of the yarn, because the number of revolutions of the false thread spindle cannot exceed an upper limiting value. At high velocities of the yarn, crinkling is obtained that lies within the stretch region, while at lower velocities of the yarn the crinkling obtained is in the highly elastic region. However, there is slippage of the yarn in the false thread spindle, and a further slippage between the false thread spindle and its driving motor, so that texturizing is not always even.

SUMMARY OF THE INVENTION

The invention is based on the problem of achieving texturizing in synthetic yarns which would endow knit fabric produced from this yarn with a high degree of elasticity and good transparency, so as to meet the requirements of women consumers better than has hitherto been possible.

This task, according to the invention, is solved with the aid of the thread separating process in such a way that after separation of the entwined portion, before winding, each yarn is subjected over a further stretch to another texturizing at the same velocity of travel. In this process it was found best to produce the texturizing that follows thread separation by twisting and heat fixation.

By means of the invention, texturization of the synthetic yarns is obtained which essentially depends upon the velocity of the separating threads, resulting in the advantages of a high thread velocity together with pronounced crinkling. As a result of the process of texturizing that immediately follows the thread separation, particularly with the false thread process, a second crinkling of the yarn is superimposed on the first process. This may be relatively weaker, and more particularly it may correspond to stretch crinkling. When using the false thread method, the rotational direction of the two texturizations is basically immaterial, so that an S-turn can be combined with a Z-turn or conversely, or even several S-turns or Z-turns can be applied to the yarns.

If the yarns produced, according to such a process, are knitted on the usual automatic round knitting machines, a knit fabric is obtained, the transparency of which corresponds to that of stretch products and is thus very great. On the other hand, the product has a remarkable elasticity in both directions, so that women's hose of the desired kind can be knitted from it.

These possibilities are apparently based on the fact that the texturization achieved by the method of thread separation, contrary to expectations, does not change or is not destroyed despite the renewed plastisizing of the yarn and subsequent texturizing. With the process according to the invention, one does not obtain a mixture of crinklings originating from the two processes of texturizing, but a new kind of yarn with the qualities of yarns texturized according to the thread separating method and the qualities of threads produced according to the texturizing process which follows the former.

This brings about a further important advantage of the yarn produced in this manner, since it possesses the even texturization of the separating thread process and despite its occasionally uneven crinkling caused by another texturizing method, it is just as suitable for knitting on an automatic round knitting machine as threads that were texturized only by the thread separating process.

This yarn can also be economically produced. This is due to the comparatively high thread velocity, which, according to the denier of the yarn, may be as high as 450 m/min.

BRIEF DESCRIPTION OF THE DRAWING

The sole FIGURE is a schematic view of assembled devices for carrying out the process according to the invention.

DESCRIPTION OF PREFERRED EMBODIMENT

Referring to the drawing, two spools **1** and **2** each supply one yarn or bundle of yarns **3** and **4**. These may be polyamide yarns or bundles of yarns in particular.

The yarns are intertwined between two guide rings **5** and **6** over a stretch **7**. Over this stretch there is a heat-

ing zone drawn schematically indicated at **8,** for example in the form of radiation heat originating from an electric heating coil.

Beyond the guide ring **6** the two threads **3** and **4** are separated from one another. They are then texturized, for instance in the form of a Z-shaped twist with relatively numerous turns per thread length. This results from the fact that the threads are drawn at a relatively high speed. The speed may, for instance, be 450 m/min.

After separation, the threads **3** and **4** are run through a feed system **17** and **18,** and are separated from one another, but continue to be treated in the same manner. A false twisting device **9** and **10** leads over a stretch **11** and **12** to a false twist in yarns **3** and **4,** fixed by heating zones **13** and **14.** Since the thread travels at a relatively high speed of the thread separating process, while the twisting apparatus can only reach a given end velocity, relatively numerous turns are produced per thread length by the thread separating process and relatively few turns by the false twisting. Following the false twisting devices **9** and **10,** the threads **3** and **4** are drawn to and wound upon spools **15** and **16.**

If these yarns are knitted on multiple system automatic round knitting machines into women's hose or pantyhose, a very elastic, but at the same time, highly transparent fabric is produced.

What I claim is:

1. Process for texturizing synthetic yarns comprising the steps of feeding yarns from two separate sources at relatively high speeds, intertwining the two yarns over a stretch, passing each yarn through a heated zone, separating the yarns from each other, texturizing said yarns by false twisting and heat fixation, drawing the threads at the same relatively high speed, and winding the threads on spools.

2. Apparatus for texturizing synthetic yarns comprising means for feeding yarns from two independent sources, means for intertwining the yarns from said feeding means, heat fixation means for said yarns, means for separating the yarns after said heat fixation, means for false twisting each yarn, a second means for heat fixation of each yarn, and spools for winding up each yarn.

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