

[54] **METHOD OF AND TENSION-REGULATING DEVICE FOR TIGHT-TWISTING OF THREADS**

[75] Inventor: **Gueorgui Mitov Petrov, Sofia, Bulgaria**

[73] Assignee: **BTR "Pamukotec" Botevgradsko Chaussee, Sofia, Bulgaria**

[22] Filed: **Oct. 26, 1970**

[21] Appl. No.: **83,972**

[30] **Foreign Application Priority Data**

Nov. 1, 1969 Bulgaria..... 13282

[52] U.S. Cl..... 57/59, 57/58.86

[51] Int. Cl..... D01h 7/02

[58] Field of Search..... 57/34 R, 58.49, 58.52, 57/58.61, 58.83, 58.86, 59-65

[56] **References Cited**

UNITED STATES PATENTS

3,309,858 3/1967 Franzen..... 57/58.86

| | | | |
|-----------|--------|------------------|-------|
| 2,847,817 | 8/1958 | Gonsalves..... | 57/62 |
| 2,843,998 | 7/1958 | Schlums..... | 57/59 |
| 2,946,176 | 7/1960 | Higgins..... | 57/62 |
| 2,238,203 | 4/1941 | Wylde et al..... | 57/59 |

FOREIGN PATENTS OR APPLICATIONS

| | | | |
|-----------|--------|-------------|-------|
| 1,485,743 | 5/1967 | France..... | 57/59 |
|-----------|--------|-------------|-------|

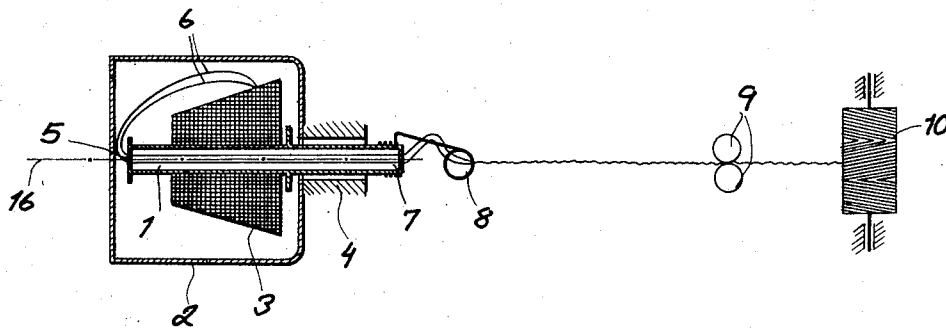
Primary Examiner—Donald E. Watkins

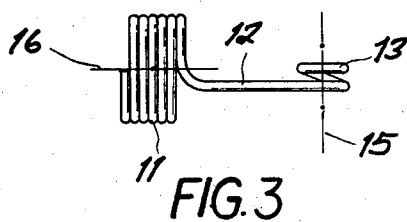
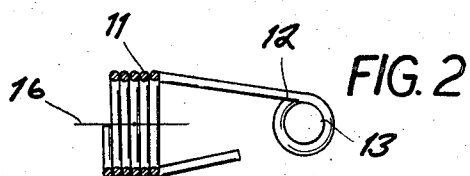
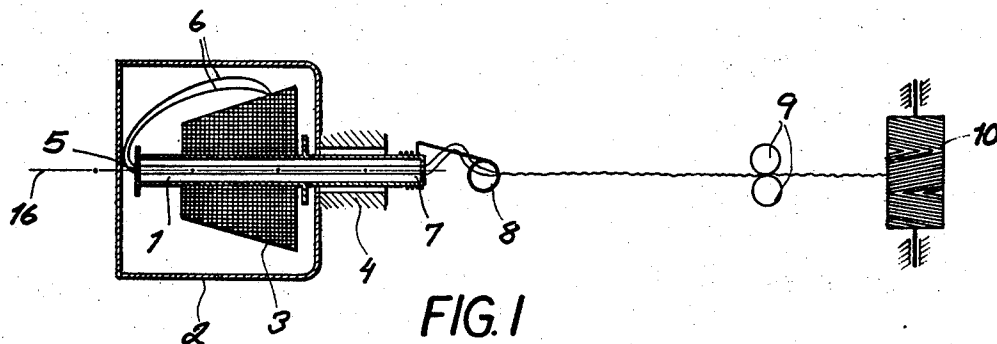
Attorney—Karl F. Ross

[57] **ABSTRACT**

A method of and a tension-regulating device for the tighttwisting of a pair of non-twisting threads unwound from a bobbin or yarn package, wherein the threads are passed without twisting through a hollow spindle, are wound one or more times around an arm of the tension-regulating device and are then passed through the eye thereof. Within the spindle, the threads are stretched and are length -equalized, the twisting being effected by the eye and a pair of drawing rollers feeding the twisted yarn to a yarn package or bobbin upon which it is wound.

4 Claims, 3 Drawing Figures





Gueorgui M. Petrov
INVENTOR

BY

Karl F. Ross
Attorney

METHOD OF AND TENSION-REGULATING DEVICE FOR TIGHT-TWISTING OF THREADS

FIELD OF THE INVENTION

The invention relates to a method of tight-twisting a straight stretch of previously nontwisted threads by means of a hollow spindle and a tension regulator or limiter.

Background of the Invention

A method of and a device for the tight-twisting of threads are known in the prior art, wherein the threads to be tight-twisted are unwound from the yarn package in a loose twisted form. From the yarn package the unwound loose twisted threads pass through a frictional sleeve in order to be decelerated, the frictional sleeve being mounted at the inlet of the hollow spindle. Then the threads receive a twist in a substantially straight stretch by means of the hollow spindle.

This method represents a second operation, since the threads to be tight-twisted have been previously loose twisted and wound up as yarn packages. This is a shortcoming of the prior-art method. Furthermore, the device is provided with decelerating sleeves having different coefficients of friction, according to the different twists and thicknesses of the yarns.

Another method and device are known in the prior art, wherein the threads are not previously twisted at all. The nontwisted threads unwound from the yarn package pass separately through yarn guides, rotatably mounted at the inlet of the hollow spindle. The threads passing through the hollow spindle are decelerated in a channel formed at the outlet of this hollow spindle. The threads receive a tight-twist and are wound up. The shortcoming of the method is that the threads must pass through guides. Furthermore a small "baloon" is formed by the non-twisted threads immediately beyond the point at which the deceleration occurs.

OBJECTS OF THE INVENTION

The main object of the invention is to use the whole length of the hollow spindle for a preliminary equalizing of the tensile stresses in the nontwisted threads.

Another object of the invention is to locate the point at which the deceleration of the threads occurs, in such a manner at the outlet of the hollow spindle, that it coincides with the geometrical axis of the spindle.

SUMMARY OF THE INVENTION

In accordance with the invention, the nontwisted threads are unwound separately from the yarn package fixed on a hollow spindle. After the passage of the nontwisted threads through the hollow spindle they are decelerated by a tension regulating limiter mounted at the discharge side of the hollow spindle and are tight-twisted by the rotary motion of the spindle. In such manner the entire twisting process is divided into two sections, zones or stretches. The first section zone or stretch extends from the unwinding point of the nontwisted threads on the yarn package to the tension regulating limiter means. In this first section, zone or stretch the threads remain untwisted. Because of the free untwisted passage of the threads through the hollow spindle, the tension threads reach the regulating limiter with equalized lengths. The second section, zone or stretch extends between the regulating limiter means and the guide means provided to guide the twisted threads toward the wind-up or takeup winding on

means. In this second section zone or stretch the tension regulating limiter fixed at the discharge end of the hollow spindle in such manner that an eye provided thereon is aligned with the geometrical axis of the hollow spindle, transmits the rotary motion of the hollow spindle to the threads. Thus the threads are tight-twisted. At the same time the tension regulating limiter adjusts the tension of the nontwisted threads and provides some stretching and equalizing of the structure of the nontwisted threads.

DESCRIPTION OF THE DRAWING

For a better understanding of the invention and to show how the same may be carried into effect, reference is now made to the accompanying drawing in which:

FIG. 1 shows a schematic diagram of a device embodying the invention;

FIG. 2 is a side elevation of the tension regulating limiter shown in FIG. 1; and

FIG. 3 is a top plan view of the tension regulating limiter.

SPECIFIC DESCRIPTION

A fixed cylinder 2 encloses a rotatable hollow spindle 1, mounted on the bearing 4. A bobbin 3 carrying the nontwisted threads 6 is mounted on the hollow spindle 1. The nontwisted threads enter freely the hollow spindle through the inlet opening 5 and emerge also freely on the other end of the hollow spindle through the discharge opening 7.

The threads are then passed around the arm 12 of a tension regulating limiter 8 and reach the receiving bobbin 10 through the drawing roller pair 9. The nontwisted threads are wound around the arm 12 of the tension regulating limiter 8 as many times as is required for increased tension in the section, stretch or zone of the formation of the twists. The twist rate is determined by the number of revolutions of the hollow spindle 1 and by the drawing velocity of the pair of rollers 9. The deceleration of the threads through the tension regulating limiter 8 avoids a back transmission of twists to the section between the tension regulating limiter 8 and the unwinding point on the bobbin 3. The threads unwound off from the bobbin form separate baloon 6 before entering the inlet opening 5, and because of the smaller drag in the cavity of the spindle the threads are stretched and their lengths equalized before entering the section of the formation of twists.

As shown in FIGS. 2 and 3, the tension regulating limiter 8 comprises an arm 12, a spiral shaped open eye 13 and a spring sleeve 11. The axis of the spiral shaped open eye 13 identified in FIG. 3 with the numeral 15 is perpendicular to the axis 16 of the spindle. The nontwisted threads are wound around the arm 12 and then pass through the eye 13. The threads thus follow the direction of the axis 16, so that no baloon is formed immediately after the regulating limiter 8.

What we claim is:

1. A device for the twisting of a pair of threads on a yarn package, comprising a hollow spindle having an axis; means for receiving said yarn package and rotating same and said spindle concurrently about said axis, said threads being unwound from said yarn package and passing through said spindle; a tension-regulating limiter mounted at an end of said spindle and having a spring sleeve surrounding said end of said spindle, an

3

arm extending generally in the direction of said axis from said sleeve, and a generally spiral shaped eye at the end of said arm, said threads passing over said arm and through said eye upon emerging from said spindle; and means spaced from said eye for receiving the threads twisted between said eye and the last mentioned means.

2. The device defined in claim 1 wherein said eye has an axis intersecting the axis of said spindle.

3. The device defined in claim 2 wherein said axis of said eye is perpendicular to the axis of said spindle.

4. A method of tight-twisting a pair of threads wound upon a yarn package without twisting, said method comprising the steps of:

- a. unwinding said threads jointly from said yarn package and passing them through a hollow spindle

4

without imparting a twist to said threads therein while stretching and length-equalizing said threads within said hollow spindle;

- b. frictionally engaging said threads by passing them jointly over an arm of a tension-regulating limiter and through an eye thereof upon emergence of said threads from said hollow spindle;

- c. gripping said threads at a location spaced from said eye and drawing said threads through said hollow spindle, along said arm and through said eye from said location; and

- d. rotating said yarn package, said hollow spindle and said tension-regulating limiter to impart a twist to said threads between said eye and said location.

* * * * *

20

25

30

35

40

45

50

55

60

65