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YARN TENSION APPLIANCE FOR TWISTING SPINDLES

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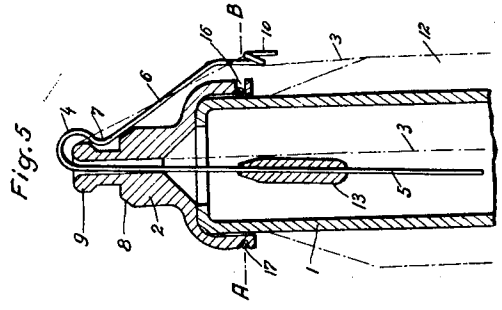

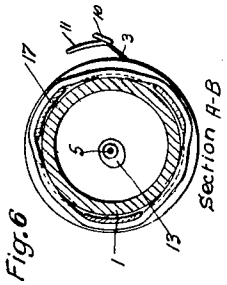

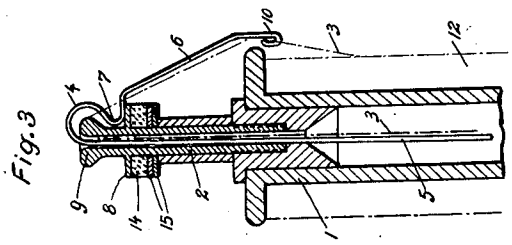

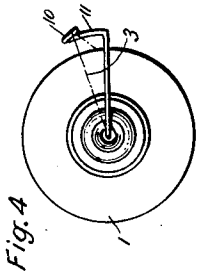

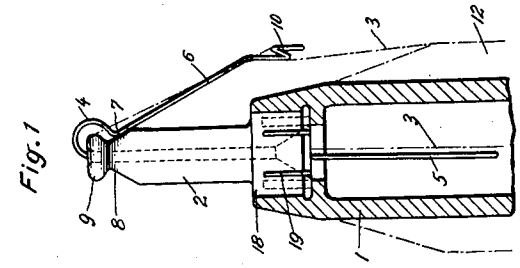

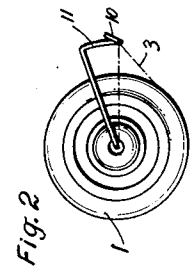

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YARN TENSION APPLIANCE FOR TWISTING SPINDLES

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6 Claims. (Cl. 242—147)

This invention relates to yarn twisting spindles and more especially to a yarn tension appliance for cabling yarn spindles.

In the new tension appliance the yarn coming from the bobbin is being guided and set rotating about the bobbin axis, when travelling overhead and traversing the center of the bobbin by a wire guiding the yarn and putting it under tension.

Yarn tension appliances for twisting spindles have been used, which were combined with twisting fliers which are supported above the bobbin on the yarn guide and are set rotating by the yarn. Twisting fliers of this kind are however not adapted for use when twisting very fine yarn, more especially if cops serve as bobbins, because they impart, owing to their great weight and the considerable friction arising in their bearings, an unduly high tension. These drawbacks are felt quite particularly when the twisting spindle shall be started working and the twisting flier shall be accelerated from the position of rest of the yarn. If the yarn coming from the bobbin is prevented from easily following the flier, it has a tendency of braking the further movement of the flier. However, the acceleration as well as the delaying of the movement of the twisting flier result in changes of the tension acting on the yarn which cannot be supported by the very fine threads and frequently cause rupture. One has also used other yarn tension appliances in connection with cabling yarn spindles, such as brakes for the accumulating disks for the lattice or the pulley, which, however, do not come up to the many requirements arising in the tensioning of the yarn. These tensioning appliances also have been found to rub off the avivage covering the yarn and the settling down of this avivage on the tensioning members hinders the satisfactory operation of these appliances.

The problem to be solved by the present invention is to provide a yarn tension appliance for twisting spindles, more especially of the cabling type, which while avoiding all the drawbacks mentioned above, guarantees a correct drawing of the yarn to be twisted from the bobbin, for instance a cop, and imparts to the thread, owing to its extraordinary sensitivity, a small and uniform tension.

I have solved this problem mainly by using a wire which guides and puts under tension the yarn coming from the bobbin, when it travels overhead and through the center of the bobbin, this wire being set rotating around the bobbin axis by the yarn. On the whole this wire has the form of a bow, one of its shanks being inserted in a tubular yarn guide arranged on top of the package sleeve, with enough play as not to affect the passage of the yarn. The other shank of the wire, which is formed with a guiding eyelet and rotates around the bobbin, is formed with a deflected portion directed toward the yarn guide and is supported partly by a shoulder provided on the yarn guide and is thereby braked to a certain extent, without, however, contacting that part of the yarn guide over which

the yarn is passing, so that there is no danger that the yarn might get pinched.

In order to further guarantee an unhindered passage of the yarn into the tubular yarn guide, the guiding eyelet is formed on a deflected terminal portion of the exterior wire shank, this deflected portion extending in one or the other direction in the circular path it traverses during rotation of the guide wire.

According to the degree of tension which shall be imparted to the yarn coming from the bobbin, tensioning wires of different weights may be used and the two shanks of such a wire may be capable of an elastic deformation so that it can pass over the correspondingly formed flanged part of the yarn guide, while resisting any tendency of the wire itself or of the yarn to push it back.

In order to further adapt the tensioning wire to the tension desired, weights may be provided which can be interchanged and are fixed removably to the interior shank of the guide wire. In order to keep such weights on the wire by clamping, this may be slightly bent at the place or near the place where such a weight shall be located.

In order to further increase the braking of the yarn guiding wire and to correspondingly vary the yarn tension, a permanent magnet may be arranged on the tubular yarn guide below the shoulder on which the guide wire is supported. This brakes the rotary displacement of the deflected wire portion on the exterior shank which abuts against the shoulder. The braking action of the magnet on the wire can be varied by changing the position of the magnet by means of displaceable disks.

I further propose to clamp the yarn guide to the package sleeve. In this modification the clamping of the tensioning member on the package sleeve may be obtained by means of an elastic member such as a rubber ring or a spiral spring. Such an elastic means may be embedded in an outward groove of the yarn guide and clamps the wire in this groove across openings in the groove. I may, however, also provide the yarn guide with a resilient, e. g., slotted bottom portion.

In order to avoid the necessity of lubricating the tensioning wire at the different places where it contacts the yarn guide and in order also to avoid any soiling of the yarn, I intend to form the yarn guide as a whole or partly of synthetic linear superpolyamides. I have found that this material, apart from its great gliding capacity, also offers the advantage of being to a great extent proof against rubbing and this is quite particularly important for the part of the yarn guide where the yarn comes into contact with it. To the same end I may arrange in this part of the yarn guide a cap made of a material which is wear-proof, for instance steel covered with a hard chromium cover and highly polished.

In the drawings affixed to this specification and forming part thereof several embodiments of a tensioning device according to this invention are illustrated diagrammatically by way of example.

In the drawings

Fig. 1 is an axial section of the yarn guide and package sleeve with the guiding and tensioning wire inserted in it, Fig. 2 being a top view of this device.

Fig. 3 illustrates a second form of the invention in axial section, showing the yarn guide inserted in the package sleeve.

Fig. 4 is a top view of the device shown in Fig. 3.

Fig. 5 is another modification of the invention, again shown in axial section, and

Fig. 6 is a cross-section on the line AB in Fig. 5.

Referring to the drawings and first to Figs. 1 and 2, there is provided in or on the package sleeve **1**, the yarn guide **2**. The yarn **3** is guided and tensioned by the somewhat bow-shaped guide wire **4** having two shanks;

the interior shank 5 of the wire is inserted with sufficient play in the yarn guide 2 for rotation therein, and the exterior shank 6 of the wire is formed with a deflected portion or knee 7 directed toward the yarn guide 2 and supported by a shoulder 8, being capable of rotating with a certain braking action around the yarn guide, while not contacting the mouth of the yarn guide, thus securing a safe guiding of the yarn. The eyelet 10 of the wire 4 is placed at the bent end 11 of the arm 6 of the wire. The end 11 of the wire is bent at an angle in one or the other direction to extend in the circular path through which rotates this end of the arm or shank 6. This arrangement of the wire 4 guiding and tensioning the yarn 3, results in that the yarn 3 coming from the bobbin, in its course from eyelet 10 to flanged mouth 9 of the tubular yarn guide 2, passes on the side of the shank 6 without contact therewith, into the tubular guide 2 whereby an unimpeded travel of the yarn is assured. In order to prevent the wire 4 from being pushed out of the yarn guide 2 by the threading wire (not shown), the two arms 5 and 6 of the wire 4 may be clamped elastically over the correspondingly shaped, flanged mouth portion of the member 2.

I may influence and vary the tension of the yarn 3 by using guide wires of different weight or by providing the wire with weights 13 which can be clamped on it. I can further influence the yarn tension by arranging below the shoulder 8 underneath the rotating arm 6 a permanent magnet 14 which exerts a braking effect on the arm 5 of the wire. This braking effect can be varied by means of disks 15 which surround the yarn guide and serve for adjusting the position of the magnet.

The yarn guide 2 can be mounted on the tube 1 by means of an elastic ring 17 which is embedded in an outer notch 16 of the yarn guide 2 and is applied to the tube 1 across interruptions in the notch 16. This may be a rubber ring or a spiral spring.

In the yarn guide 2 inserted in the tube 1 the bottom portion may be rendered elastic by slots 19 (Fig. 1).

I wish it to be understood that I do not desire to be limited to the details described in the foregoing specification and shown in the drawings for obvious modifications will occur to a person skilled in the art.

I claim:

1. Yarn tensioning appliance for twisting spindles of the axially traversed type, comprising in combination, a yarn package sleeve, a tubular yarn guide mounted on said sleeve, a shoulder on said tubular guide, a bow-shaped yarn guide wire having an interior shank arranged to axially traverse with play said tubular guide and part of said sleeve, an exterior shank arranged to extend outside said tubular guide and a bent connecting portion joining the two shanks, said exterior shank including a deflected portion arranged to abut for sliding rotary displacement against said shoulder whereby to support said guide wire in spaced relationship to the point of entry of the yarn into said tubular guide, and a terminal portion on said exterior shank bent to extend in the direction of the circular path traversed by said terminal portion during rotation of the guide wire.

2. Yarn tensioning appliance for twisting spindles of the axially traversed type, comprising in combination, a yarn package sleeve, a tubular yarn guide mounted on said sleeve, a shoulder on said tubular guide, a bow-shaped yarn guide wire having an interior shank arranged to axially traverse with play said tubular guide and part of said sleeve, an exterior shank arranged to extend outside said tubular guide and a bent connecting portion joining the two shanks, said exterior shank including a deflected portion arranged to abut for sliding rotary displacement against said shoulder whereby to support said guide wire in spaced relationship to the point of entry of the yarn into said tubular guide, a terminal portion on said exterior shank bent to extend in the direction of the circular path traversed by said terminal portion during rotation of the guide wire, said tubular yarn guide including an exterior flange portion, and said guide wire connecting portion being adapted to resiliently pass over said flange portion.

3. Yarn tensioning appliance for twisting spindles of the axially traversed type, comprising in combination, a yarn package sleeve, a tubular yarn guide mounted on said sleeve, a shoulder on said tubular guide, a bow-shaped yarn guide wire having an interior shank arranged to axially traverse with play said tubular guide and part of said sleeve, an exterior shank arranged to extend outside said tubular guide and a bent connecting portion joining the two shanks, said exterior shank including a deflected portion arranged to abut for sliding rotary displacement against said shoulder to support said guide wire in spaced relationship to the point of entry of the yarn into said tubular guide, a terminal portion on said exterior shank bent to extend in the direction of the circular path traversed by said terminal portion during rotation of the guide wire, and said interior shank being arranged to mount for replacement a weight to serve as brake for the rotating guide wire.

4. Yarn tensioning appliance for twisting spindles of the axially traversed type, comprising in combination, a yarn package sleeve, a tubular yarn guide amounted on said sleeve, a shoulder on said tubular guide, a bow-shaped yarn guide wire having an interior shank arranged to axially traverse with play said tubular guide and part of said sleeve, an exterior shank arranged to extend outside said tubular guide and a bent connecting portion joining the two shanks, said exterior shank including a deflected portion arranged to abut for sliding rotary displacement against said shoulder whereby to support said guide wire in spaced relationship to the point of entry of the yarn into said tubular guide, a terminal portion on said exterior shank bent to extend in the direction of the circular path traversed by said terminal portion during rotation of the guide wire, and a magnet arranged below said shoulder on said tubular guide to serve as brake for the rotating guide wire.

5. Yarn tensioning appliance for twisting spindles of the axially traversed type, comprising in combination, a yarn package sleeve, a tubular yarn guide mounted on said sleeve, a shoulder on said tubular guide, a bow-shaped yarn guide wire having an interior shank arranged to axially traverse with play said tubular guide and part of said sleeve, an exterior shank arranged to extend outside said tubular guide and a bent connecting portion joining the two shanks, said exterior shank including a deflected portion arranged to abut for sliding rotary displacement against said shoulder whereby to support said guide wire in spaced relationship to the point of entry of the yarn into said tubular guide, a terminal portion on said exterior shank bent to extend in the direction of the circular path traversed by said terminal portion during rotation of the guide wire, and a permanent magnet arranged for displacement below said shoulder on said tubular guide whereby to adjust its braking action on the rotating guide wire.

6. Yarn tensioning appliance for twisting spindles of the axially traversed type, comprising in combination a yarn package sleeve, a tubular yarn guide mounted on said sleeve, a shoulder on said tubular guide, a bow-shaped yarn guide wire having an interior shank arranged to axially traverse with play said tubular guide and part of said sleeve, an exterior shank arranged to extend outside said tubular guide and a bent connecting portion joining the two shanks, said exterior shank including a deflected portion arranged to abut for sliding rotary displacement against said shoulder whereby to support said guide wire in spaced relationship to the point of entry of the yarn into said tubular guide, a ter-

minal portion on said exterior shank bent to extend in the direction of the circular path traversed by said terminal portion during rotation of the guide wire, and resilient means for mounting said tubular yarn guide on said yarn package sleeve.

References Cited in the file of this patent

UNITED STATES PATENTS

223,133	Hall	Dec. 30, 1879
2,241,260	Herr	May 6, 1941
2,445,721	Bartholomew	July 20, 1948