June 19, 1956

J. BEYER

2,751,166

TENSION DEVICE

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Fig. 1.

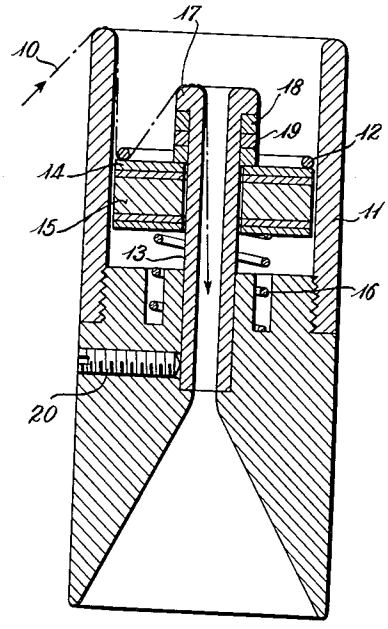
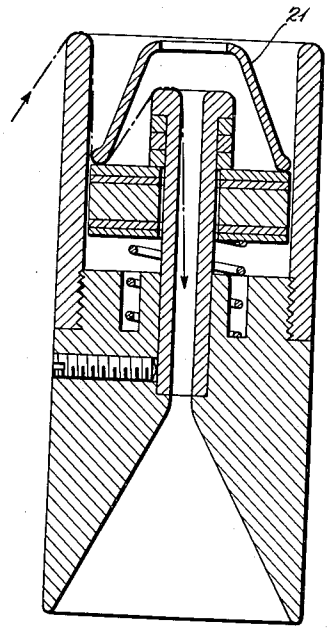


Fig. 2.



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TENSION DEVICE

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4 Claims. (Cl. 242—150)

This invention relates to an improved tensioning device for a doubler or cap twister which renders the same particularly suited to the production of crepe.

In double twisters of the type shown in Kingsbury Patent 2,478,926 the thread advances from a stationary thread package through the hollow interior of the package and through a rotating hollow spindle positioned coaxially in the hollow interior of the thread package. In such an arrangement, it is necessary that the thread be pretensioned quite accurately as it enters the hollow interior of the thread package. To this end, thread tensioning devices have been developed which fit on the cap of a cap twister and the tension applied thereby is made adjustable either by magnetic means or by adjustable weights. While this arrangement is of good general utility, it has been found unsuitable for crepe yarn where both the position and inclination of the tensioning disk are so changed that both the angle of contact between the thread and the disk and the pressing force of the disk are decreased to an inadequate level.

It is an object of this invention to overcome the foregoing deficiencies for double twisters so that a predetermined desired tension may be maintained while dealing with crepe yarn.

It is proposed according to the present invention to cause the yarn entering the hollow interior of the yarn package on the twister to follow an angular path providing enlarged areas of contact and to provide for adjustment of the angularity of the path as may be necessary for yarns of differing denier.

Other objects and advantages of this invention will be apparent upon consideration of the following detailed description thereof in conjunction with the annexed drawings wherein:

Figure 1 is a view in vertical section of the cap of an otherwise conventional cap twister, and

Figure 2 is a view of a modified type of cap for an otherwise conventional cap twister.

Referring in detail to Figure 1, attention is directed to the fact that Kingsbury Patent 2,478,926 discloses the basic assembly of a cap twister of the type to which the present invention applies. The Kingsbury patent discloses a cap having a hollow central interior and it is in such a cap that the present device is intended to be put.

Yarn **10** coming from a stationary package, not shown, enters the cap by passing over the edge of a tube **11**, under and then through a coaxial ring **12** and finally over the top edge of a coaxial tube **13** into the central core of the package. It will be immediately recognized that the provision of a tube such as **11** at the top end of the cap of a doubler is unique and provides for a large and stable contact between the yarn and both the ring **12** and the mouth of the tube **13**. The ring **12** is mounted over an annular disk **14** which in turn is mounted over an annular magnet assembly **15**. The disk **14** and the magnet assembly **15** are mounted for sliding movement along the tube **13** and are biased upwardly by a spring **16**. A flange **17** at the top of the tube **13** and spacing rings or

shims **18** and **19** thereunder serve to hold the annular disk **14** of the magnet assembly **15** against the thrust of spring **16**. It can be seen that the number of spacing rings **18** and **19** and/or the thickness of such rings controls the position of annular disk **14** and magnet assembly **15** along the length of tube **13**. Since ring **12** simply rests on top of disk **14** and is held there by the magnetic force of the magnet assembly **15**, adjustment of the position of disk **14** and magnet **15** inevitably likewise adjusts the position of ring **12**. The further ring **12** gets from the top of tube **13**, the smaller will be the angle defined by the thread in its passage under ring **12**. Thus, an adjustment is provided whereby the area of contact of the yarn can be increased or decreased to meet different operating conditions.

In order to facilitate varying the number of spacing rings **18** and **19** mounted on the tube **13**, the tube is mounted by a removable set screw **20** which, when released, will permit the tube to be withdrawn from the cap of the twister. The desired number and thickness of rings such as **18** and **19** are slipped thereover and the tube is returned to position, first manually held against the spring thrust and then held by the set screw **20**.

The arrangement of Figure 2 is in all respects similar to that of Figure 1 except that instead of the ring **12** there is a dished annular body **21** presenting a ring at its base which functions in the manner and for the purpose of ring **12**. In view of the dished nature of the part **21**, it is possible by lowering the position of the magnet **15** to cause wiping contact between the thread and the inside surface of member **21** further to increase the drag imparted to the thread.

It can be seen that by either one of the arrangements of Figure 1 or Figure 2, two areas of braking are provided in comparison with the construction of the type shown in the patent to Kingsbury mentioned above. It can be seen that the path described by thread **10** not only involves a higher tension in the thread than would be the case if tube **13** were absent but also allows adjustment of the total area of contact between the thread and the various parts of the thread tensioning device.

What is claimed is:

1. A thread tensioning device for a double twister comprising a first tube, a ring, supporting means including a surface for supporting said ring coaxially within the first tube below the upper end thereof and a second tube located coaxially within the ring and having its upper end lying in a plane closer than the plane of said ring to the upper end of the first tube, the upper ends of said tubes and the lower surface of said ring together defining a thread passageway from outside the first tube to within the second, said ring supporting means also including means magnetically to bias said ring against said supporting surface.

2. A thread tensioning device for a double twister comprising a first tube, a ring, supporting means including a surface for supporting said ring coaxially within the first tube below the upper end thereof, a second tube located coaxially within the ring and having its upper end lying in a plane closer than the plane of said ring to the upper end of the first tube, the upper ends of said tubes and the lower surface of said ring together defining a thread passageway from outside the first tube to within the second, and means vertically to adjust said ring supporting means, said ring supporting means also including means magnetically to bias said ring against said supporting surface whereby the ring is vertically adjusted with said supporting means.

3. A thread tensioning device for a double twister comprising a first tube, a ring, supporting means including a surface for supporting said ring coaxially within the first tube below the upper end thereof, a second tube located

coaxially within the ring and having its upper end lying in a plane closer than the plane of said ring to the upper end of the first tube, the upper ends of said tubes and the lower surface of said ring together defining a thread passageway from outside the first tube to within the second, said second tube having a flange at its upper end, means resiliently to bias said supporting means upwardly, means surrounding said second tube and held by its flange to limit upward movement of said supporting means resulting from said resilient bias and magnetic means constituting a part of said supporting means for biasing said ring against said supporting surface.

4. A thread tensioning device for a double twister comprising a first tube, a hollow frusto-conical body having a ring at its base, supporting means including a surface for supporting said frusto-conical body coaxially within

the first tube with the base of the body below the upper end of the tube, a second tube located coaxially within the body and having its upper end lying in a plane closer than the plane of said ring to the upper end of the first tube, the upper ends of said tubes and the lower surface of said ring together defining a thread passageway from outside the first tube to within the second, said body supporting means also including means magnetically to bias the base of said body against said supporting surface.

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