Oct. 21, 1952 A. J. AMMERALL 2,614,773

TENSION DEVICE

Filed Nov. 20, 1950

Fig. 1.

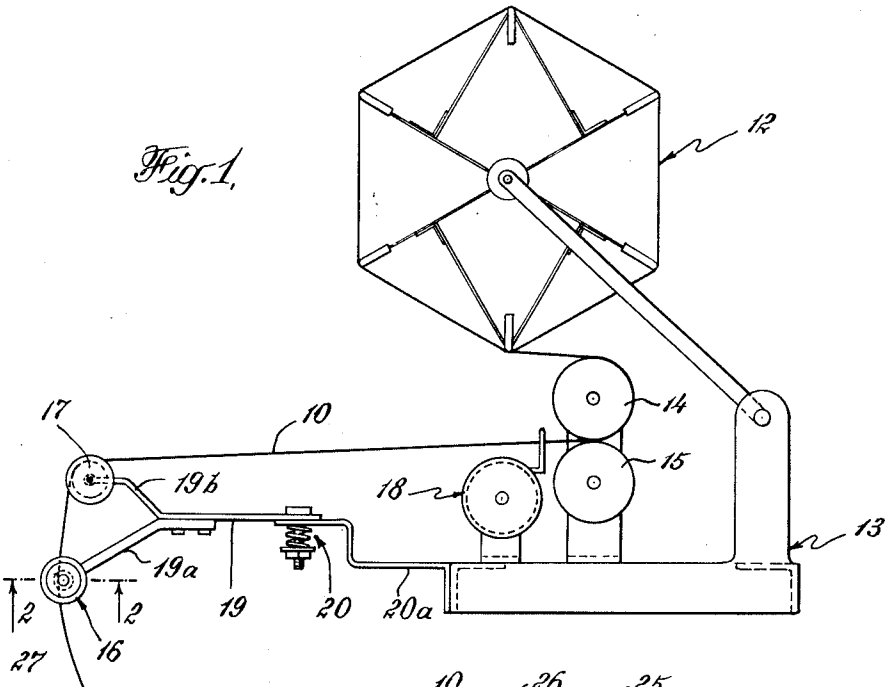


Fig. 2.

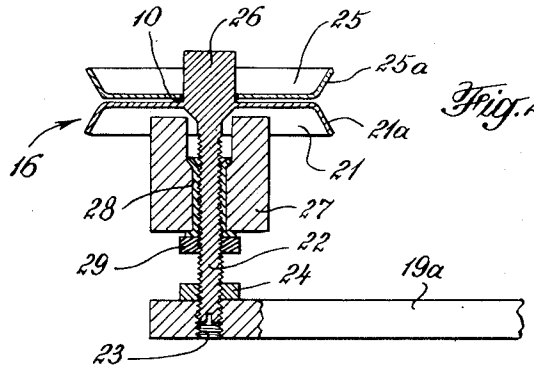


Fig. 3.

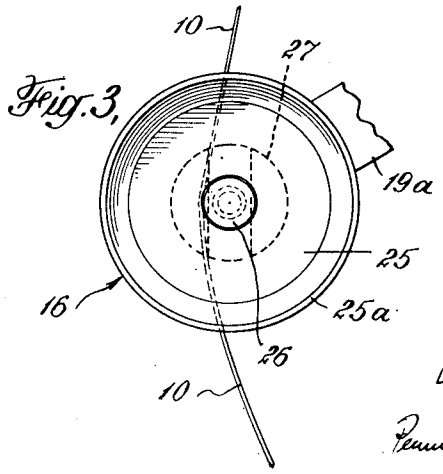
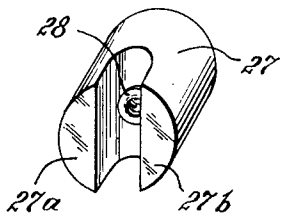


Fig. 4.



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TENSION DEVICE

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6 Claims. (Cl. 242—150)

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This invention relates to tensioning devices employed in the textile industry for applying tension to a strand being advanced, for example, in a winding operation. More particularly, the invention is concerned with a novel strand tensioning device, which is simple in construction and reliable and uniform in action, is readily adjustable to vary the drag imposed on a strand passing through it, and can be quickly and easily threaded up.

The new tensioning device operates by magnetic action and it includes a pair of plates having opposed flat front faces. One of the plates is made of non-magnetic material and has a stem rigidly attached to its rear face, the stem being adapted to be secured to a support. The second plate is made of magnetic material and one of the plates has a central stud projecting from its front face and the other has a central aperture, through which the stud projects. The magnetic plate is drawn toward the non-magnetic plate by a magnet mounted on the stem for adjustment lengthwise thereof, and tension is applied to a strand passing between the plates and over the stud by the clamping action of the plates. The magnetic plate is freely rotatable relative to the non-magnetic plate and the tension applied to the strand may be varied by changing the position of the magnet on the stem. In order to facilitate threading up of the device, the plates are provided with inclined peripheral flanges, which are divergent and guide the strand between the faces of the plates.

For a better understanding of the tensioning device of the invention, reference may be had to the accompanying drawing, in which:

Fig. 1 is a diagrammatic view in side elevation of a yarn winding apparatus employing one form of the tensioning device;

Fig. 2 is a sectional view on line 2—2 of Fig. 1;

Fig. 3 is an end elevational view of the device; and

Fig. 4 is a perspective view of a magnet employed in the device.

The apparatus illustrated is of the type used in winding yarn from packages into skeins on a reel, and, in the apparatus, the yarn 10 is drawn from a spinning frame tube 11 to a conventional reel 12 mounted on a support 13. A driven roll 14 cooperating with an idler roll 15 draws the yarn from the tube 11 through the tensioning device 16 and over a yarn guide 17. A standard traversing device 18 directs the yarn to rolls 14, 15 in such a manner that the yarn will be properly wound on the reel. A tensioning device 16

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and a guide 17 are mounted on the arms 19a, 19b of a bracket 19, which is attached yieldingly by a bolt and spring connection generally designated 20 to a bracket 20a rigidly attached to support 13.

The tensioning device 16 comprises a disc 21, which is made of non-magnetic material, such as bronze, and has flat front and rear faces and an inclined peripheral flange 21a. A stem 22 is rigidly secured to the rear face of the disc and is preferably formed integral with the disc. The stem is threaded, so that the stem can be screwed into a threaded opening 23 in a support, which, in this case, is the arm 19a of bracket 19. A lock nut 24 on the stem is used to hold the stem tightly on the arm.

The device includes a second disc 25, which is made of magnetic material and has a flat front face opposed to the front face of disc 21 and an inclined peripheral flange 25a. The disc 25 is formed with a central aperture, through which projects a stud 26 attached to and preferably integral with disc 21. The aperture is slightly larger in diameter than stud 26, so that disc 25 may rotate freely on the stud.

A cylindrical magnet 27 is adjustably mounted on stem 22 and the magnet is slotted lengthwise to provide poles 27a, 27b facing disc 21. The magnet is preferably made by casting and it is formed with a central bore, through which stem 22 projects, the bore containing an internally threaded bushing 28. By rotation of the magnet, it may be moved along the stem toward and away from the discs, and it is held in the desired position of adjustment by a lock nut 29 on the stem.

In the use of the tensioning device, the yarn is introduced between the discs 21, 25 by being placed in the channel formed by the flanges 21a, 25a on the discs. A pull on the yarn draws it down between the discs, where it is clamped by the pressure applied to it by disc 25 attracted by magnet 27. The tension applied to the yarn is determined by the tightness with which it is clamped between the discs and this, in turn, depends on the distance between the magnet and the discs. As the yarn is drawn between the discs, disc 25 rotates freely and the clamping force is uniformly applied to the length of yarn between the discs.

The new tensioning device is of simple construction, is easily kept clean, and is reliable and uniform in action. By shifting the magnet lengthwise of the stem, a close adjustment of the drag upon the yarn may be obtained, and the yarn may be quickly and easily inserted between the discs.

I claim:

1. A device for applying tension to an advancing strand, which comprises a plate of non-magnetic material having a flat front face, a stem rigidly attached to the rear face of the plate centrally thereof and adapted to be secured to a support, a magnet encircling and mounted on the stem for adjustment toward and away from the plate, a plate of magnetic material having a flat front face opposed to the front face of the non-magnetic plate, and a stud attached to the front face of one plate centrally of said face and entering a central aperture in the other plate, the stud fitting loosely in the aperture and the magnetic plate being freely rotatable relative to the non-magnetic plate.

2. A device for applying tension to an advancing strand, which comprises a plate of non-magnetic material having a flat front face, a stem rigidly attached to the rear face of the plate centrally thereof and adapted to be secured to a support, a magnet encircling and mounted on the stem for adjustment toward and away from the plate, a stud rigidly attached to the front face of the plate to extend centrally therefrom, and a plate of magnetic material having a flat front face opposed to the front face of the non-magnetic plate, the magnetic plate having a central aperture loosely receiving the stud.

3. A device for applying tension to an advancing strand, which comprises a plate of non-magnetic material having a flat front face, a threaded stem integral with the plate and extending from the rear face of the plate centrally thereof, a magnet screwed on the stem and adjustable toward and away from the plate along the stem, the stem having a part exposed beoynd the magnet, a stud integral with the plate and projecting centrally from its front face, a plate of magnetic material having a flat front face opposed to the front face of the non-magnetic plate and a central aperture, in which the stud is loosely received, and a support for the device attached to the exposed part of the stem.

4. A device for applying tension to an advancing strand, which comprises a plate of non-magnetic material having a flat front face, a stem rigidly attached to the rear face of the plate centrally thereof and adapted to be secured to a support, a magnet encircling and mounted on the stem for adjustment toward and away from the plate, the magnet being of cylindrical form and being transversely slotted to form two poles at its end adjacent the plate, a stud rigidly attached to the front face of the plate to extend centrally

therefrom, and a plate of non-magnetic material having a flat front face opposed to the front face of the non-magnetic plate and a central aperture loosely receiving the stud.

5. A device for applying tension to an advancing strand, which comprises a plate of non-magnetic material having a flat front face, a threaded stem integral with the plate and extending from the rear face of the plate centrally thereof, a magnet having an axial bore, through which the stem extends, a bushing within the bore having internal threads mating with those on the stem, the magnet being adjustable toward and away from the plate by rotation relative to the stem, a stud integral with the plate and projecting centrally from its front face, and a plate of magnetic material having a flat front face opposed to the front face of the non-magnetic plate and a central aperture, in which the stud is loosely received.

6. A device for applying tension to an advancing strand, which comprises a disc of non-magnetic material having a peripheral flange inclined to the plane of the disc and extending away from the front face of the disc, a stem rigidly attached to the rear face of the disc centrally thereof and adapted to be secured to a support, a disc of magnetic material having a peripheral flange inclined to the plane of the disc and extending away from the front face of the disc, a magnet encircling and mounted on the stem for adjustment lengthwise thereof, and a stud attached to the front face of one disc and loosely entering a central aperture in the other disc, the discs being disposed with their flanges diverging and the magnetic disc being attracted by the magnet toward the non-magnetic disc.

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