Sept. 8, 1936. E. C. GWALTNEY 2,053,609

DIE TWISTER

Filed Sept. 27, 1935

Fig. 1.

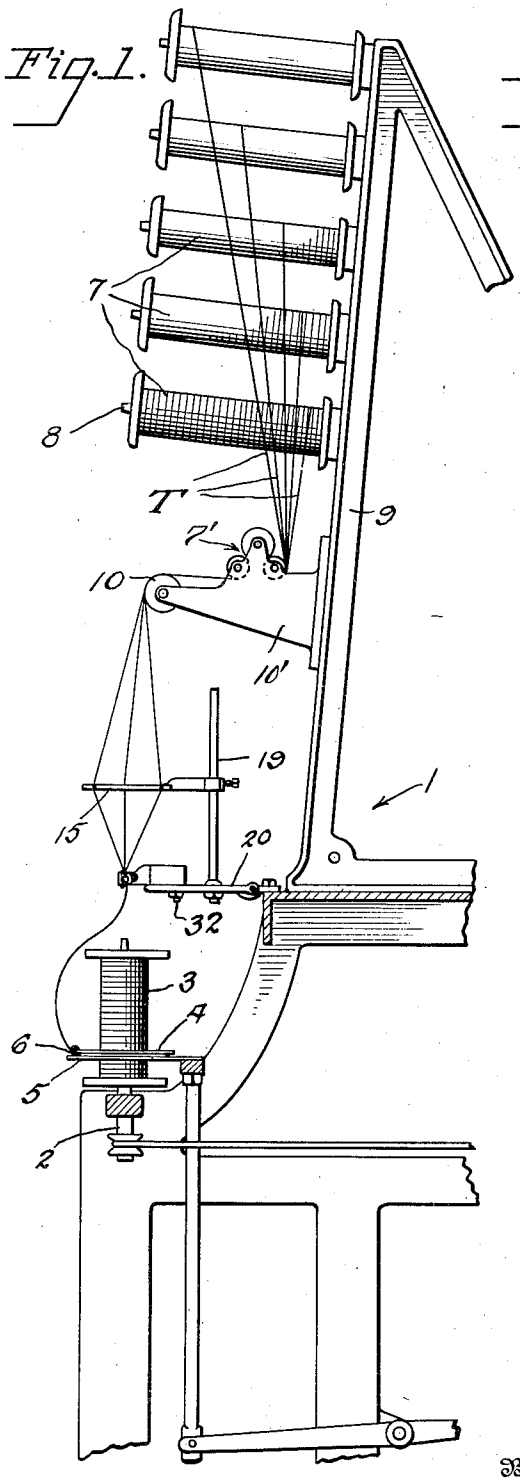


Fig. 2.

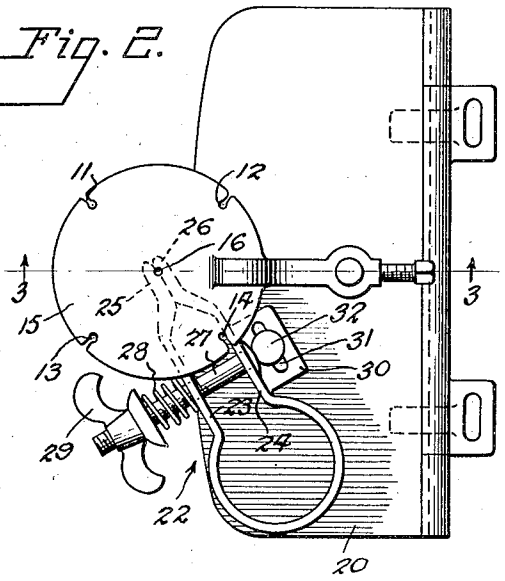
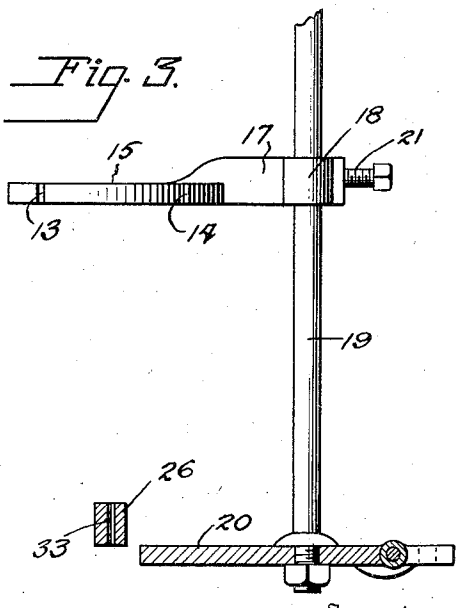


Fig. 3.



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DIE TWISTER

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2 Claims. (Cl. 117—27)

The invention forming the subject matter of this application relates generally to ring twisting machines in which a number of strands or yarns are laid into single twisted coils; and, particularly, to an arrangement of thread guides by which the individual strands or yarns are conducted from a series of separate spools, or from warper beams, to the travelers on the rings of the very old and well known ring twisters.

The main object of the invention is to provide the old type of ring twister with an attachment whereby the yarns are conducted to a nippering aperture co-axial with the axis of rotation of the ring traveler and with the yarns symmetrically arranged around the said axis, to produce a twisted yarn in which the coils are compactly and evenly coiled around each other throughout the length thereof.

Machines of the type for producing twisted yarns of this character are disclosed in the United States Patent No. 1,076,096, October 21, 1913. However, these machines are rather complex and costly to manufacture. As compared with the ring twister, they are slow in operation and therefore add to the cost of manufacture by slowing production. The normal ring twister operates normally at about twice the speed of the twister disclosed in the aforesaid patent and costs about one-fourth to manufacture. It is, therefore, another object of the invention to modify the old ring twister so as to produce the "Brownell" cord more rapidly and at a greatly decreased production cost.

Other objects of the invention will become apparent as the detailed description thereof proceeds.

In the drawing:

Figure 1 is an end view, somewhat diagrammatic and sectional, illustrating so much of the common ring twister as seems essential to the disclosure of my invention.

Figure 2 is a top plan view of the invention as applied to an eyelet guide plate forming part of the common ring twister; and

Figure 3 is a vertical transverse section taken on the line 3—3 of Figure 2, part of the apparatus being shown in side elevation.

Referring to the accompanying drawing:

The reference numeral 1 indicates generally the supporting framework of the machine, upon which is suitably supported the rotating spindle 2 carrying the winding spool 3, extending as usual through the aperture of a ring 4 on the ring rail 5. A ring traveler 6 is mounted on the ring 4 to slide thereon and rotate about the axis of the spindle 2.

The spools 7 are loosely mounted on studs 8 projecting from a support 9 which forms part of the framework 1, and carry the strands or yarns T to be twisted and wound upon the spool 3. The yarns T are conducted from the spool 7 around the usual feed rolls 7' and over a guide roller 10 suitably mounted for rotation on a bracket 10' fixed to the support 9. The outer periphery of the guide roller 10 is arranged so that the axis of the spindle 2 forms a tangent to the cylindrical surface thereof. The threads T are then conducted from the roller 10 to the apertures 11, 12, 13, and 14 formed in a guide plate 15 concentric with the center aperture 16 and equiangularly spaced around the guide plate. The plate 15 is fixed to an arm 17 extending from a sleeve 18 slidably mounted on a rod 19, which in turn is detachably secured at its lower end to an eyelet plate 20 forming a part of the standard ring twister. The sleeve 18 is slidable lengthwise of the rod 19 and is adapted to be secured in adjusted position thereon by means of the set screw 21.

On the ordinary ring twister, partly illustrated herein, and of the general type shown in the U. S. patent to Allen, No. 775,550, November 22, 1904, the yarn is drawn from the supply spool 7 by the usual feed rolls 7'. These rolls are driven from the head end gearing of the machine and run the entire length of the machine. The yarn is drawn under these rolls which rotate to maintain a definite surface speed. As the spindles run at a constant speed, the proper amount of twist per inch is effected by changing the speed of the rolls. These rolls perform the function of drawing the yarn down from the supply spools and feed the yarn through a guide eye to the spindle.

Surrounding the spindle, there is the usual ring on which a traveler rotates. The friction of this traveler on the ring furnishes sufficient pull to wind the yarn tightly on a spool inserted on the spindle. Because of this arrangement, it has been found impractical to guide each strand being twisted separately as is done in the twister illustrated in the Brownell patent, No. 1,076,096.

It was generally considered that on the Brownell twister it was essential that the die should be tight. In the ring twister illustrated herein it has been found that so long as the strands were fed to the die at the proper angle, the die could be so loose, and the friction imparted by the guide, so small, that it could be

overcome by the pull of the traveler. By increasing the pull of this traveler, as by fastening two together by a leather strap, I have been able to lay the yarn by proper adjustment to a loose die, so as to obtain a twist substantially as smooth as that obtained on the well-known Brownell machine.

The difference between the ring twister disclosed herein and the Brownell twister, is this: The Brownell twister pulls the yarn from the spools through the dividing plates and through a die, or other forming mechanism, by means of rollers which revolve inside the flyer. That puts the twist in the yarn and winds it on the spool. In the present invention the yarn is fed from the supply spools by the feed rolls at such speed relative to the speed of rotation of the ring twister spindles as to give the cord any desired number of twists to the inch. Since the Brownell machine is gear driven, its speeds are low as compared with the speeds of the ring twister; and the cost of operation and upkeep of the Brownell twister is very great in comparison with the ring twister.

In the present invention, the eyelet commonly secured to the plate **20** has been replaced by a nipper, designated generally by the reference numeral **22**. The nipper **22** is formed of spring material and comprises a pair of arms **23** and **24** having their respective ends **25** and **26** adapted to be held in yielding contact with each other by means of the bolt **27** passing through both arms of the nipper. A compression spring **28** interposed between the arm **23** and a wing nut **29** screw-threaded on the bolt **27**, serves to hold the ends **25** and **26** in yielding contact with each other when the wing nut is adjusted to secure the desired pressure.

A plate **30** extends laterally from the arm **24** of the nipper and is provided with a slot **31** through which passes a bolt **32**, extending through an aperture suitably formed therefor in the plate **20**. It will be apparent from the drawing that the nipper **22** may be adjusted angularly around the axis of the bolt **32**, and lengthwise thereof by means of the slot **31**. These two adjustments provide for the positioning of the nipper with its nippering aperture **33** arranged in alignment with the axis of the spindle and a center aperture **16** of the guide plate **15**. As in the Brownell machines, the adjustment of the guide plate **15** relative to the nippering aperture **33** determines the pitch of the twist in the finished yarns.

In the operation of the device the threads T from the spools **7** are passed over the guide roller **10** and through the guide apertures **11**, **12**, **13** and **14** in the guide plate **15**, and then drawn together and passed through the ring traveler **6** to be secured to the winding spool **3**, the twisting operation being effected as in the ordinary ring twisting machine. In this case, however, the threads are more symmetrically and evenly coiled around each other than has heretofore been possible by twisting operations performed on the ordinary ring twister.

I claim:

1. The combination with a ring twister including the usual frame and having feed rolls and means for changing the surface speed of said rolls in relation to the speed of rotation of the spindles of the machine, of a nipper or die mounted on the frame with its aperture coaxial with the axis of the rotating spindle, a yarn roll mounted on the framework with the axis of the spindle tangent to the cylindrical surface of said roll, and a guide plate mounted on said frame between said nipper and yarn roll.

2. The combination with a ring twister including the usual frame and having feed rolls and means for changing the surface speed of said rolls in relation to the speed of rotation of the spindles of the machine, of a nipper or die mounted on the frame with its aperture coaxial with the axis of the rotating spindle, a yarn roll mounted on the framework with the axis of the spindle tangent to the cylindrical surface of said roll, a guide plate interposed between said nipper and yarn roll and having a series of yarn receiving apertures concentric with said axis, and means for adjusting said guide plate toward and from said nipper or die to vary the pitch of the twist in the twisted yarns.

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