April 1, 1930. A. AMBYE 1,752,878

TWISTER TUBE FOR SPINNING FRAMES

Filed Sept. 20, 1929

Fig. 1.

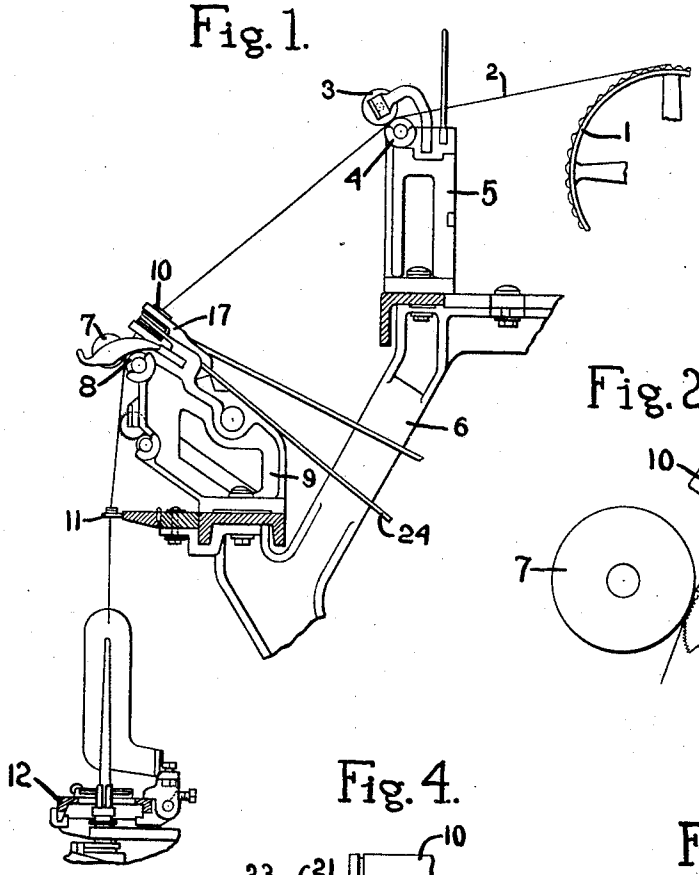


Fig. 2.

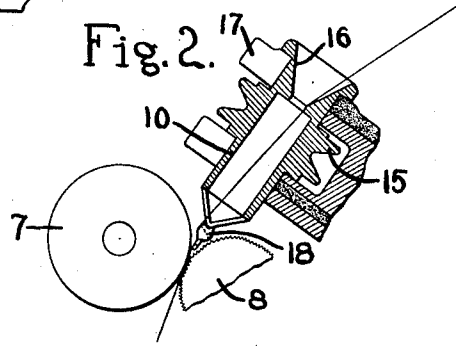


Fig. 4.

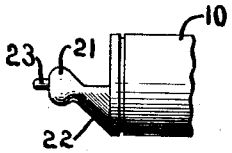


Fig. 3.

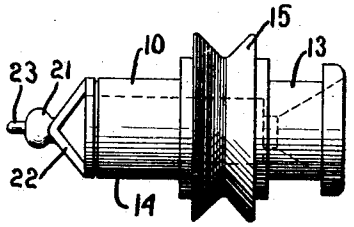
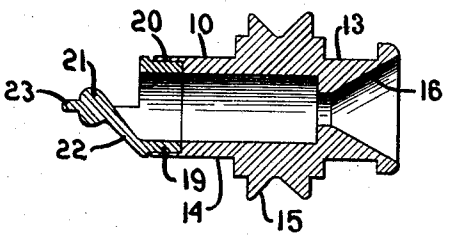


Fig. 5.



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UNITED STATES PATENT OFFICE

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TWISTER TUBE FOR SPINNING FRAMES

Application filed September 20, 1929. Serial No. 393,910.

This invention relates to twister tubes which are incorporated into the structure of spinning machines to impart a false twist to the roving.

By reason of the soft and relatively fragile character of the unspun roving it is highly desirable and in some cases practically necessary that it be strengthened in some manner in order to withstand the drawing operation. The usual practice is to induce a false twist in the roving during the drawing operation.

The chief object of this invention is to provide a twister tube which will produce the required degree of twist to protect the roving while it is subjected to the drawing stresses.

The object of the invention is further to provide a twister tube which effectually produces the twist without injury to the roving.

A further object of the invention is to provide a tube of such design that it may be readily adapted to suit the particular requirements of stock and draft.

The object of the invention is further to provide a tube which will insure an even twist throughout the length of the roving by reason of the special design of the twisting tip.

These and other objects and features will appear more fully from the specification in connection with the accompanying drawings and will be particularly pointed out in the claims.

In order to give a better understanding of the invention a particular embodiment is herein shown in the drawings.

Fig. 1 is a transverse sectional view through a portion of a spinning frame illustrating the relation between the twister tube and its cooperating elements.

Fig. 2 is a cross sectional view through the twister tube and a portion of its mounting bracket showing also the relative position of the lower drawing rolls.

Fig. 3 is a side elevation of the twister tube.

Fig. 4 is a detail view of the outlet end of the tube shown in a position at right angles to that shown in Fig. 3.

Fig. 5 is a longitudinal cross section through the tube.

The false twist induced in the roving to give it strength is a well known expedient. The effectiveness of such twisting operation is directly dependent upon the design of the twister tube. The density and weight of the roving varies in some cases an appreciable amount throughout its length a condition which is unavoidable but which causes much trouble and interferes with the production of an even run of yarn. This condition must be met not only in the major spinning operation but also during the drawing operation. One of the features of this invention resides in the provision of means to give the roving a uniform twist during the drawing operation. If special provision is not made to overcome such conditions a very irregular yarn will result. The natural tendency of the roving between the drawing rolls is to elongate first at the weakest points whereas the desirable result would be that the roving be drawn first at the points of greatest density. When the roving yields at the weakest points the portions already light are made lighter a condition which is most undesirable. By producing an even false twist in the roving this undesirable condition is greatly minimized.

As above stated the roving varies in density throughout its length and as a consequence it will naturally tend to twist more easily at certain portions than at other portions. If therefore the roving were permitted to assume a twist according to its natural tendency the greatest twist would take place at the points of least density thus causing uneven drawing and unsatisfactory production. The present invention was evolved to meet these and other unavoidable circumstances and control them in such a way as to produce a uniform high quality yarn.

Only a portion of a spinning frame is illustrated in the drawings sufficient to show the essential cooperating elements in their relation to the twister tube. Since the tube is adaptable to a wide variety of spinning devices and the principal elements thereof are well known to those skilled in the art it is deemed unessential to completely describe the operation of the spinning machine. The particular machine shown is provided with a drum 1 over which the roving 2 passes from

the spool or other device upon which it is wound. From the drum 1 the roving passes between a pair of drawing rolls 3 and 4 journalled in a bracket 5 mounted on the main frame 6. Another pair of drawing rolls 7 and 8 are journalled in a bracket 9 fixed to the main frame 6. The two pairs of drawing rolls are driven in the usual or in any desired manner. The lower pair of rolls 7 and 8 are driven at a speed in excess of the upper rolls 3 and 4 to produce the required draft in the roving.

The twister tube indicated generally at 10 is located close to the bite of the drawing rolls 7 and 8 which is the usual practice in such devices in order to induce the maximum twist at the point where the drawing action is most severe namely near the bite of the lower drawing rolls. After emerging from the rolls 7 and 8 the roving passes through a guide eye 11 and thence to the ring spinning device indicated generally at 12.

The tube 10 has external bearings 13 and 14 at the top and bottom respectively with a whorl 15 situated between. Any other desirable arrangement of bearings and whorl may be employed however without departing from the invention. A wide mouthed conical section 16 provides a means of guiding the end of the roving into the bore of the tube when threading it therethrough.

The tube is rotatably mounted in an adjustable bracket 17 in such position that its specially constructed tip 18 lies close to the bite of the rolls 7 and 8. The tip 18 may be constructed integral with the tube or may be a separate element as shown in Fig. 5 in which case it may be pressed in and held by friction as shown in the drawings or it may be threaded into the end of the tube. In either of these cases the tip is formed with a short tubular or skirt section 19 which fits a counter-bored portion 20 in the bore of the tube. The spherical tip portion 21 is supported a short distance from the end of the tube and upon its axis by a hollow conical supporting member 22 one-half of which is cut away. The spherical portion 21 has extending outwardly therefrom upon the tube axis a tip or point 23 of small diameter about which the roving winds as it leaves the spherical portion 21 and passes between the rolls 7 and 8. The tube may be driven in any suitable manner. As herein shown a belt 24 is passed around the whorl and is driven from a pulley actuated by some moving part of the machine.

The twist in the roving is obtained chiefly by the whipping action set up by the rapid rotation of the twister tube. The whipping action in the present device is governed by the spherical portion 21 of the twisting tip. The roving as it passes through the tube wraps itself about the tip in a spiral path and is thus caused to follow the surface of the spherical portion 21. The roving is thus held away from the axis of the tube to an extent determined by the size of the spherical portion. By causing the roving to follow the contour of the sphere a definite predetermined whipping action is set up in the roving thereby inducing a twist therein.

It is very desirable to be able to modify the degree of whipping to suit the various requirements of stock and draft. In the present invention this may be done by varying the size of the spherical section 21. A further benefit derived from such construction lies in the uniform results obtained by the use of the spherical tip which concentrates the greater part of the twisting action to the portion of the roving adjacent the lower drawing rolls. As a result of the foregoing condition the tendency for the twist to be greatest at the thin portions of the roving is reduced to a minimum. Since the greater part of the twisting takes place in a comparatively short section of the roving wherein there is at no time included a portion of maximum and minimum density, for the reason that no such abrupt differences exist in the roving, a uniform twist is maintained. Furthermore what is quite as important is the fact that the spherical portion of the tip will maintain the whipping action uniform at all times. This is due to the fact that the roving in contact with the spherical surface is at all times at a fixed and predetermined distance from the axis of the tube regardless of its peripheral position thereon.

It will be observed that the conical supporting member 22 merges into a minor segment of the spherical member 21 so that the major segment of the segmental surface which has its center at the point 23 is entirely free and unobstructed, thus enabling the roving or yarn to wrap around an extended major segment of the spherical tipped portion.

The function of the tip 23 is to receive the roving as it passes in its spiral path from the spherical surface of the portion 21, and direct it to a point close to the axis of the tube from where it passes into the bite of the drawing rolls 7 and 8. It is quite important that the ball or spherical tip portion 21 and the points 23 be adjusted close to the fluted roll 8. By so doing the roving, when passing between the roll and the ball, is given an extra rub before winding on the end of the tube point.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is:

1. A twister tube for spinning machines comprising bearings and a whorl, the bore of the tube presenting an inwardly converging entering section, a spherical tip member, having a radially projecting point, and means supporting the spherical tip member at a distance from the outlet end of the tube with

the point extending outward on the tube axis and with the major segment of the spherical surface centering at the point free and unobstructed.

2. A twister tube for spinning machines provided with bearings and a whorl, the bore of the tube presenting an inwardly converging entering section and a connecting cylindrical section opening at the outlet end of the tube, an extension at the outlet end thereof acting to induce the twist in the yarn and comprising an axially positioned spherical portion having a point extending outwardly therefrom on the tube axis, and with the major segment of the spherical portion centering at the point free and unobstructed, whereby the yarn as it passes over the spherical portion is given the required whipping motion to induce the proper amount of twist.

3. A twister tube for spinning machines comprising bearings and a whorl, the bore of the tube presenting a wide mouthed entering section converging inwardly to a relatively small aperture and a relatively larger cylindrical section connecting therewith and opening at the outlet end, a spherical tip member having a radially projecting point, a hollow half conical connecting member supporting said spherical member at a distance from the outlet end of the tube with the point extending outward on the tube axis and with the major segment of the spherical surface centering at the point free and unobstructed and with the inner surface of the connecting member forming a continuation of the inner surface of the bore.

4. A twister tube for spinning machines comprising bearings and a whorl, the bore of the tube presenting a wide mouthed entering section converging inwardly and a relatively large cylindrical section opening at the outlet end, a removable twisting tip member having a spherical portion and a radially projecting point, and a hollow half conical connecting member supporting said spherical portion at a distance from the outlet end of the tube with the point extending outward on the tube axis and with the major segment of the spherical surface centering at the point free and unobstructed.

In testimony whereof, I have signed my name to this specification.

ANTHON AMBYE.