

[54] **APPARATUS FOR SELECTIVELY CHANGING THE SENSE OF ROTATION OF THE TWIST TUBE OF A FALSE-TWIST MACHINE**

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[57] **ABSTRACT**

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Apparatus for selectively changing the direction of rotation of twist tubes in a false-twist machine containing two axially parallel rollers in the cuneate throats of which at least one twist tube is supported comprising, support means, shafts rotatably carrying the rollers and supported in the support means, two further shafts also rotatably carried by the support means coaxial with the first shafts and spaced therefrom, driving rollers carried by the further shafts and adapted to be driven by a belt, and coupling means carried by the further shafts at the other ends thereof and which are adapted for selective coupling with opposite ends of the roller carrying shafts.

[30] **Foreign Application Priority Data**

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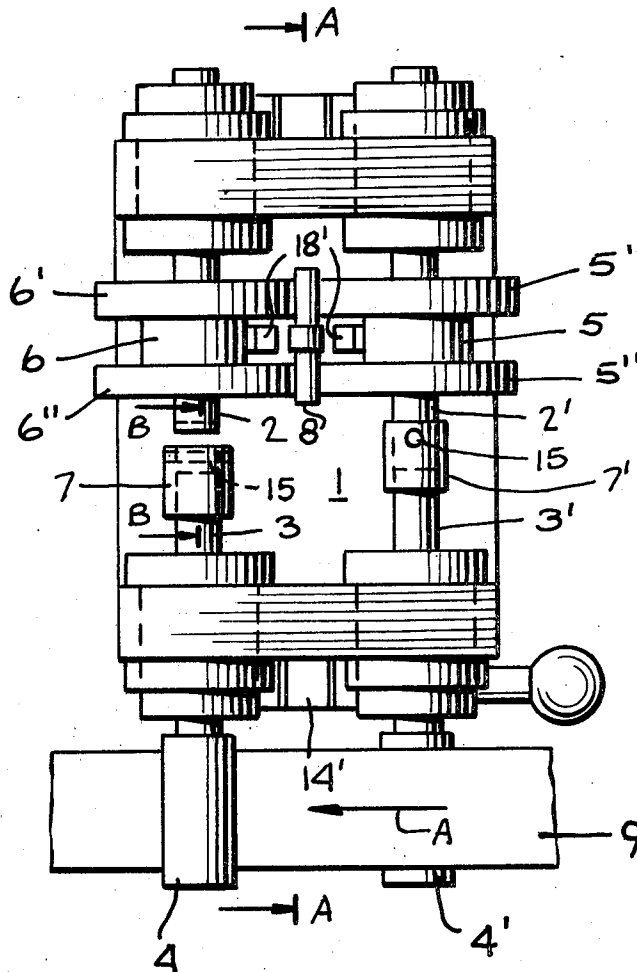
[58] Field of Search ... 57/77.45, 77.3, 58.57, 58.59, 57/77.33, 77.35; 192/20, 21

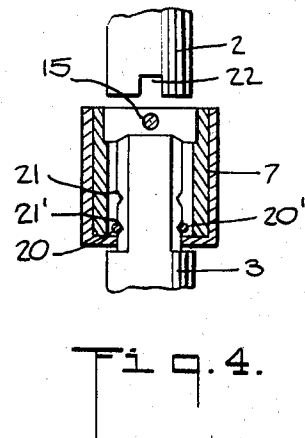
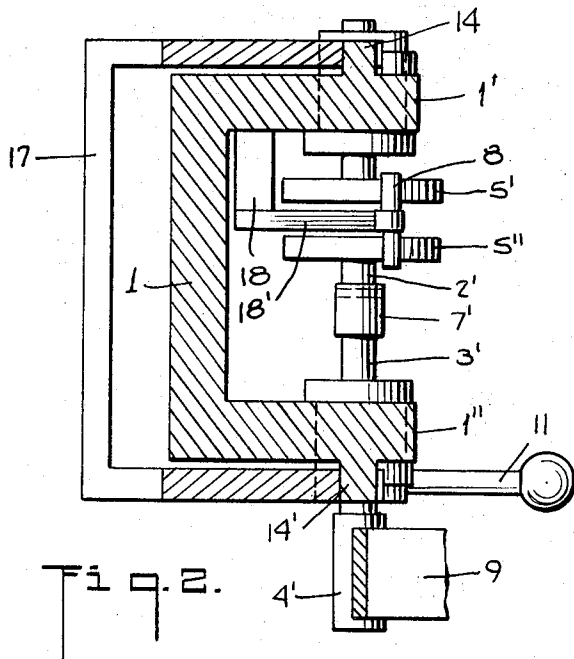
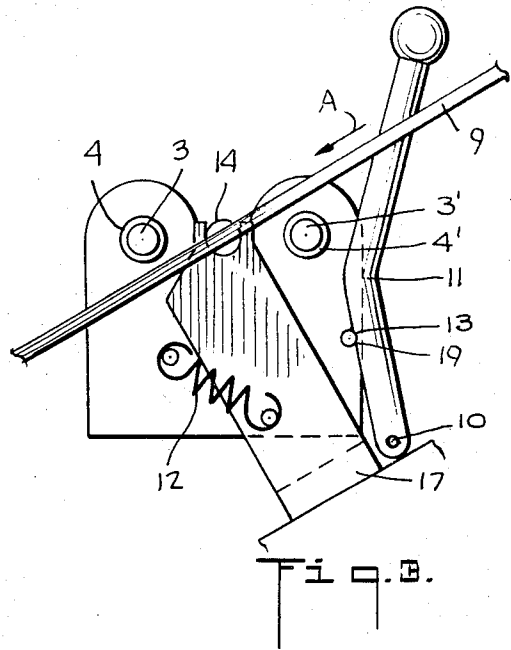
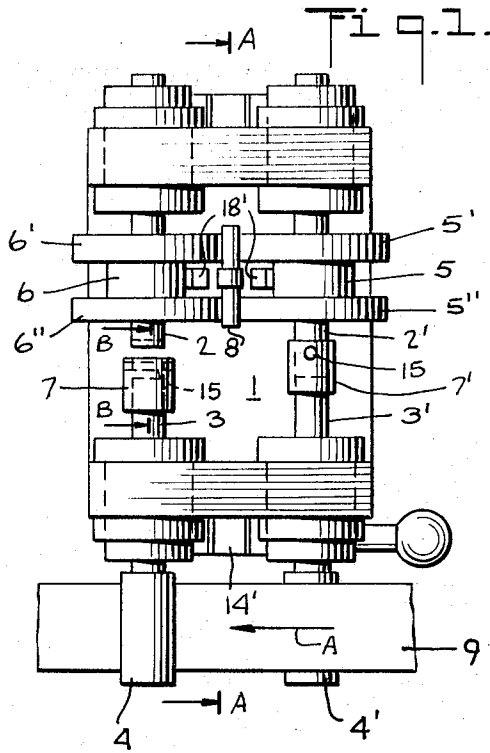
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6 Claims, 4 Drawing Figures





APPARATUS FOR SELECTIVELY CHANGING THE SENSE OF ROTATION OF THE TWIST TUBE OF A FALSE-TWIST MACHINE

The present invention relates generally to apparatus for treating yarns and the like, and more particularly to means for selectively changing the sense of rotation of the twist tube of a false-twist machine, wherein yarn is textured while it advances linearly.

False-twist machines are known in which the twist tubes of a plurality of processing stations are directly or indirectly brought to rotation by a drive belt common to all processing stations. The direction of rotation of the driving belt of such machines may or may not be reversible.

A known machine which is operated with irreversible belt drive presents, for each processing station, a support plate rotatable around its center of gravity on which false-twist devices are arranged by pairs and each contains a drive and a support roller, as well as a permanent magnet maintaining the twist tube in the cuneate throat between the rollers. The actuation of a lever provided at one end of the support plate effects insertion of the two drive rollers into contact with the face or back of the drive belt, or the removal therefrom, so that opposite rotation of the twist tubes of the two false-twist devices is obtained.

With this apparatus, it is possible to effect rotation of one half of the twist tubes in one sense, and the other half thereof in the other sense. A reversal of the sense of rotation of the twist tubes without reversal of the direction of movement of the belt is, however, not possible.

Furthermore, in order to reverse the sense of rotation of the twist tubes while the direction of movement of the drive belt remains unchanged, apparatus are known for selectively changing the position of the drive rollers of false-twist devices at the face or back of the drive belt. The change of position of the drive rollers, however, also causes the change of position of the twist tubes supported thereon, whereby the path of the advancing yarn is deviated in the texturing zone; and this may lead to irregularities in yarn quality.

Accordingly, I have conceived apparatus of the class described by which I am able to eliminate the foregoing disadvantages of known false-twist devices, and to contribute a device which permits reversal, by choice, of the twist tubes in a simple way.

The solution of this problem, according to the present invention, is realized in a false-twist device containing two axially parallel rollers in the cuneate throat of which at least one twist tube is supported in tangential contact therewith. The rollers are mounted on shafts and, coaxially with the latter and at a certain distance therefrom, two further shafts are mounted for rotation, the latter bearing, at the ends situated opposite the roller shafts, driving rollers to be driven by means of a drive belt. At the other ends, each of the further shafts carry coupling means, each being couplable with the opposite end of the roller shaft.

The coupling means may each comprise an axially shiftable socket provided with shaft-engaging means adapted to engage cooperating means at the free ends of the roller shafts.

The support may, furthermore, be a swivellable body, the swivelling shaft of which is thus-arranged with respect to the driving belt so that, in drive position, one

of the driving rollers is in contact with one face of the belt and the other driving roller with the other face thereof.

There has thus been outlined rather broadly the more important features of the invention in order that the detailed description thereof that follows may be better understood, and in order that the present contribution to the art may be better appreciated. There are, of course, additional features of the invention that will be described hereinafter and which will form the subject of the claims appended hereto. Those skilled in the art will appreciate that the conception upon which this disclosure is based may readily be utilized as a basis for the designing of other structures for carrying out the several purposes of the invention. It is important, therefore, that the claims be regarded as including such equivalent construction as do not depart from the spirit and scope of the invention.

A specific embodiment of the invention has been chosen for purposes of illustration and description, and is shown in the accompanying drawings, forming a part of the specification, wherein:

FIG. 1 is a front view of apparatus according to the present invention;

FIG. 2 is a sectional view taken along line A—A of FIG. 1;

FIG. 3 is a bottom view of the device; and

FIG. 4 is an enlarged sectional view taken along line B—B of FIG. 1.

As shown in FIGS. 1 and 2, the device includes a support 1 with two parallel support plates 1', 1'', each of which has two bores. Through the bores in plate 1', and vertically with respect to the latter, the shafts 2, 2' extend; and similarly shafts 3, 3', respectively, coaxial with the shafts 2, 2'', extend through the bores in plate 1''. Rollers 5, 6, each of which consists of two discs 5', 5'' and 6', 6'', are mounted on shafts 2, 2' below the plate 1', and these are maintained at a distance from each other by suitable means such as sockets. In a cuneate throat formed by the discs 5, 5' and 6, 6', and in parallelism with the roller shafts, a twist tube 8 is positioned; and a horseshoe magnet 18 presses the twist tube against the rims of the discs 5, 5' and 6, 6'. As shown, the flat pole shoes 18' extend parallel to the plane of the horseshoe.

Driving rollers 4, 4' are provided on the shafts 3, 3' below the plate 1'', and the support 1 is adapted to swivel in the holder 17 by means of projections 14, 14' formed integral with the support 1 and extending into appropriate recesses in the holder 17, whereby the insertion of the driving rollers 4, 4' into contact with an endless drive belt 9 running through all processing stations, or removal therefrom, is made possible. By means of spring 12, as can be seen in FIG. 3, the support 1 is fixed in drive position, the roller 4 being applied to one face of the belt 9 moving in the direction of the arrow A, so that it rotates in counterclockwise direction; whereas roller 4' is applied to the other face of the belt and is rotated clockwise. In order to disengage the driving rollers 4, 4' from the belt 9, a lever 11 is swivelled around shaft 10 whereby a groove 19, provided on the lever, is brought into engagement with a cam 13 provided on the support plate 1'', and the support 1 is swivelled.

Above the support plate 1'', on the ends of the shafts 3, 3', are provided the sockets 7, 7' which are coaxial with the latter and which can be shifted axially. As can

be seen from FIG. 4, the sockets 7, 7' bear, on their free end, a diametral pin 15, 15'. In the interior of the sockets, there are provided two wires 20, 20' of spring steel which pass as chords of an arc along the shaft end which is of reduced diameter and in which are formed two annular grooves 21, 21'. In the disengaged position shown in FIG. 4, the wires 20, 20' are engaged with the annular groove 21'.

By way of example, in order to effect a coupling connection between the shaft 2 and 3, the socket 7 is shifted axially until the wires 20, 20' are engaged with the annular groove 21 and the pin 15 with the groove 22 of shaft 2. Thereby, the roller 6 takes the function of drive roller of the false-twist device and rotates in counterclockwise direction, as does the roller 4. The twist tube 8 is thereby driven in clockwise direction. To reverse the sense of rotation of the twist tube 8, the socket 7 is disengaged and a coupling connection, between the shafts 2' and 3', is created, as shown in FIGS. 1 and 2. In this case, the roller 5 becomes the drive roller of the false-twist device and, as does the roller 4', rotates in clockwise direction. The twist tube 8 is, therefore, driven in counterclockwise direction.

Instead of providing a twist tube in only one of the cuneate throats formed by the discs 5, 5' and 6, 6', such a twist tube may also be provided in the other cuneate throat, whereby both twist tubes rotate in the same direction.

From the foregoing description, it will be seen that the advantages obtained by the device of the present invention particularly consist in that the sense of rotation of the twist tubes can be reversed in a simple and safe manner, selectively at any processing station of a machine, and that no change of position of the drive rollers or of the twist tubes supported thereby is effected. By this means, no deviation of the lineal path of the yarn takes place whereby the risk of irregular yarn quality, due to such deviation in other machines, is eliminated.

I believe that the construction and operation of my novel apparatus will be understood and that its advantages will be fully appreciated by those persons skilled in the art.

I claim:

1. Apparatus for selectively changing the sense of rotation of the twist tubes of a false-twist machine containing two axially parallel rollers (5,6) arranged to form cuneate throats therebetween, at least one twist tube (8) supported in tangential contact with the rollers

in one of the throats, characterized by support means (1), shafts (2,2') rotatably carrying the rollers (5,6) and supported in the support means (1), two further shafts (3,3'), also rotatably carried by the support means (1) and coaxially with the shafts (2,2') and spaced therefrom, driving rollers (4,4'), carried by the said further shafts (3,3') at one end thereof and adapted to be driven by a belt (9), and a coupling means (7,7'), carried by the said further shafts (3,3') at the other ends thereof and which are adapted for selective coupling with the opposite ends of the first shafts (2,2').

2. Apparatus according to claim 1, characterized in that each coupling means consists of a socket (7,7') coaxial with its respective shaft (3,3') and axially shiftable and engageable with annular grooves (21,21') at one end of its said respective shaft, each socket being provided at its free end with means (15,15') which, upon coupling, is engaged with corresponding means (22) at the adjacent end of the roller shaft to transmit rotation of said respective shaft to its coaxial shaft (2,2').

3. Apparatus according to claim 1, characterized in that the support (1) is swivellable between two positions and that its axis is arranged with respect to the drive belt (9) whereby, in one position, one driving roller (4) is applied to one face of the belt (9) and the other driving roller (4') to the other face of the belt and in the other positions said driving rollers are out of contact with the belt (9).

4. Apparatus according to claim 1, characterized by a pair of parallel shafts mounted for rotation, roller means disposed on each shaft for rotation therewith and arranged so that the rims thereof form at least one cuneate throat, a further pair of shafts respectively axially aligned with the shafts of said first pair, driving means carried by said further pair of shafts and adapted to be driven by drive means to effect rotation of said further pair of shafts in annular directions opposite from each other, and coupling means carried by said further shafts and adapted selectively to couple same with the aligned shaft of said first pair.

5. Apparatus according to claim 4, characterized in that means are provided for shifting said driving means into and out of engagement with said drive means.

6. Apparatus according to claim 5, characterized in that said driving means are rollers and said drive means is a belt.

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