United States Patent

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[54] APPARATUS FOR FALSE TWISTING YARN

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[52] **U.S. Cl.** **57/77.45**

[51] **Int. Cl.** **D01h 7/92**, D01h 7/46

[58] **Field of Search** 57/77.3–77.45, 57/89, 92, 103, 104

[56] **References Cited**

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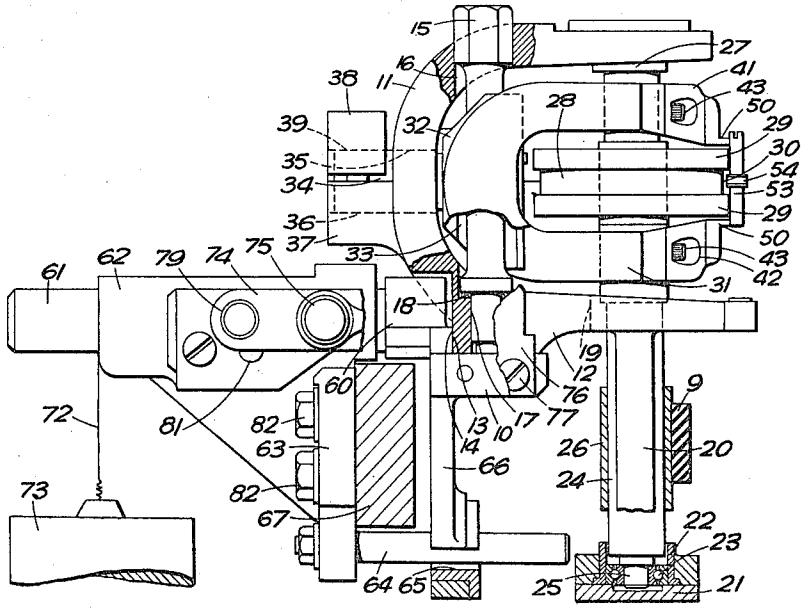
[57] **ABSTRACT**

A false twisting head having a rotatable drive shaft which head is slidably mounted on a fixed support in a direction transverse to the drive shaft axis. Means are provided for urging the head in one or the opposite direction with respect to the support to engage the drive shaft with one or the opposite sides of an endless moving drive belt.

6 Claims, 3 Drawing Figures



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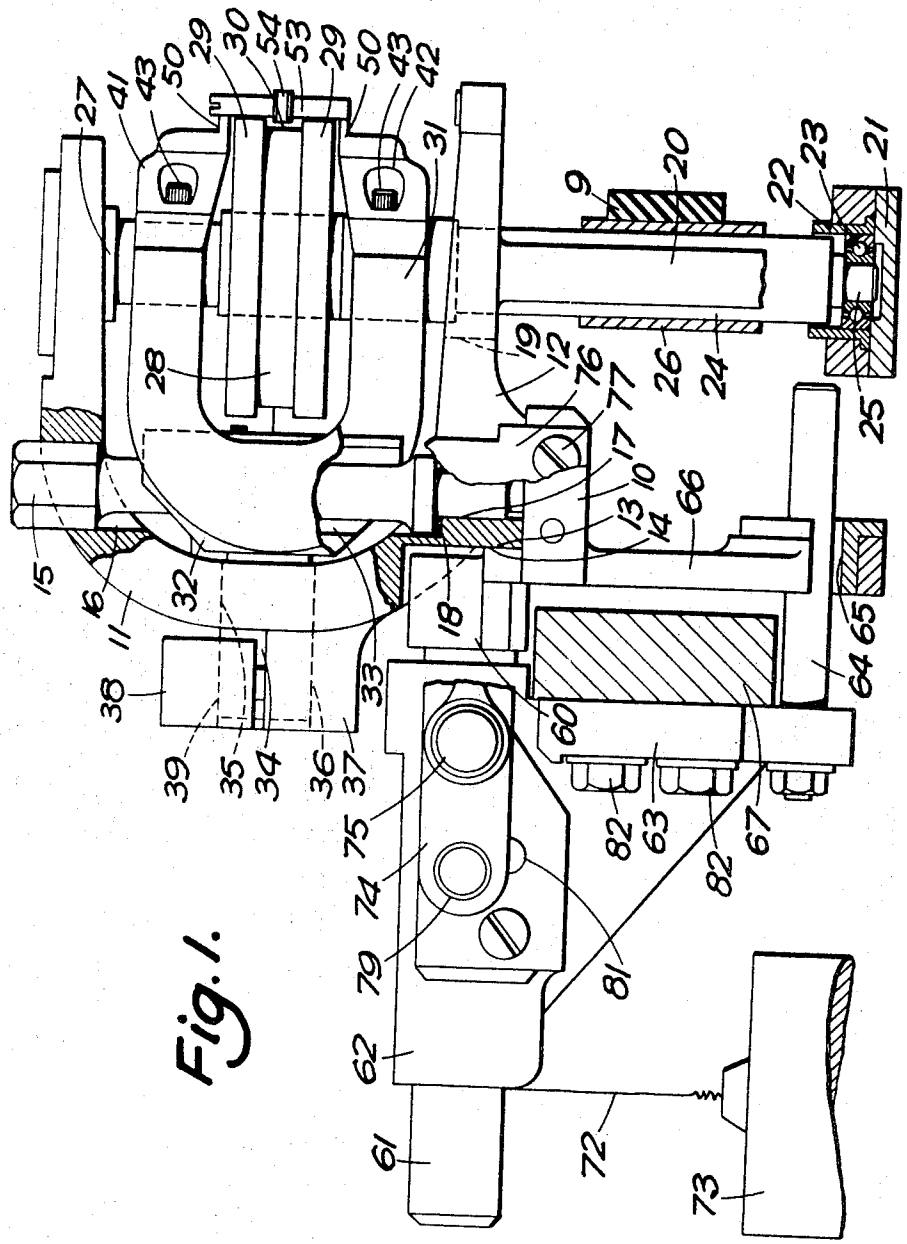

Fig. 1.

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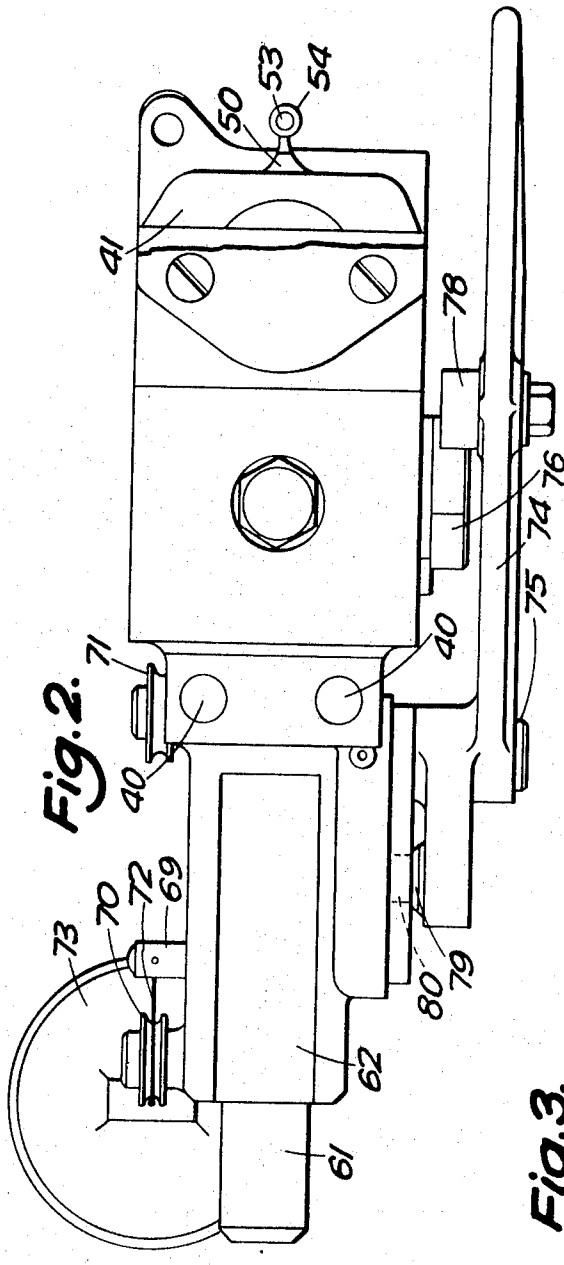

Fig. 2.

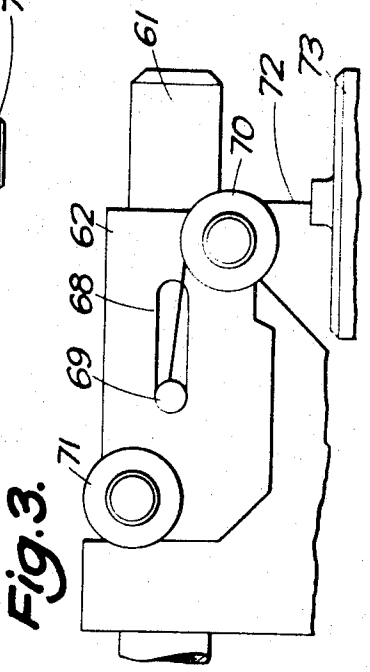

Fig. 3.

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APPARATUS FOR FALSE TWISTING YARN

This invention relates to apparatus for false twisting yarn.

The invention provides an apparatus for false twisting yarn comprising a false twisting head having a rotatable drive shaft for driving a yarn engaging device, which shaft is arranged for driving engagement with an endless movable belt and which head is mounted for movement between a first position in which the shaft is on one side of the path of travel of the belt and a second position in which the shaft is on the other side of the path of travel, and means are provided for selectively biasing the head towards one or other of those positions so that the shaft can be urged into engagement with one or other sides of the belt.

The head may be mounted for linear movement between said first and second positions.

The head may be biased towards one or other of the two positions by a weight secured to one end of a tether the other end of which is anchored to the head of a location between two guides mounted on the support at locations spaced apart in the direction of said movement, the tether being led around one or other of the guides so that the weight acts to urge the head in one or other or said directions.

The guides may comprise rollers mounted on the support for rotation about horizontal axes extending transverse to said direction of movement of the head.

The mounting for the head may comprise a slide on the head which is constrained to move in a slideway on a fixed support.

The slide may comprise a rod and the slideway a sleeve in which the rod is slidably engaged.

Sliding movement of the head may be limited by the ends of a slot extending along the sleeve, in which slot a pin on the rod is slidable.

The following is a description of some embodiments of the invention reference being made to the accompanying drawings in which:

FIG. 1 is a partly sectioned side elevation of a false twist head,

FIG. 2 is a plan view of the false twist head shown in FIG. 1, and

FIG. 3 is a side elevation view of the other side of the false twist head.

Referring to FIGS. 1 and 2 of the drawings, there is shown a false twist head comprising a baseplate **10** on which a U-shaped frame **11** is mounted with the limbs of the frame extending horizontally and spaced vertically one above the other.

The lower of the limbs of the frame is formed with a downwardly extending boss **12** the bottom face of which engages the upper face of the plate **10**. The boss is formed on one side thereof with a shoulder **13** which engages a step **14** formed on the plate. The interengagement of the shoulder **13** with the step **14** locates the frame **11** in the required alignment on the plate. The frame **11** is secured to the plate **10** by a bolt **15** which extends with clearance through a hole **16** in the upper limb of the frame and a hole **17** in the lower limb and the boss and is screw threaded at its lower end which is received in a screw threaded hole (not shown) in the plate **10**. The bolt **15** has a face **18** towards the lower end thereof which abuts the upper face of the lower limb of the frame so that the limb is clamped to the plate. The upper end of the bolt **15** has an hexagonal head which projects from the hole **16** to enable the bolt to be readily tightened or released.

The lower limb of the frame **11** is divided into two side-by-side parts by a slot extending from the free end of the limb part way along the slot, the end of the slot remote from the free end of the limb being indicated by the reference numeral **19**. Extending downwardly from the two parts of the lower limb are two elliptical section struts **20** the lower ends of which are connected by a bridging piece **21**. The struts are arranged so that their major axes extend transversely to said lower limb.

A bearing housing **22** is formed on the bridging piece **21** between the struts in which a roller bearing **23** is located.

A vertically extending shaft **24** located between the struts **20** rests at its lower end on the inner annulus of the bearing and has a spigot **25** which is received in the inner annulus. The shaft is of greater diameter than the minor axes of the struts **20** and the part of the shaft between the struts is encircled by a tightly fitting sleeve **26** of hard wearing synthetic material. A horizontally moving driving belt **9** makes frictional driving engagement with the sleeve **26**. The shaft extends through the slot between the two parts of the lower limb of the frame, across the U-shaped frame and is mounted at its upper end in a further bearing **27** housed in a bore in the upper limb of the frame.

Secured on the part of the shaft **24** between the limbs of the frame is a driving wheel comprising a solid cylindrical member **28** of a light nonmagnetic alloy to the periphery of which are secured two bands **29** of hard wearing rubberlike synthetic material the bands being spaced apart to form a groove **30** between them.

A pair of powerful horseshoe permanent magnets **31** (only one of which can be seen) are spaced apart by, and secured by adhesive to, a nonmagnetic support block **32**. The block has a vertical hole **33** extending through it through which the aforesaid bolt **15** passes with clearance. Projecting from the side of the block adjacent the base of the U-shaped frame **11** is a cylindrical spigot **34** which extends through a hole **35** in the bend on the frame **11** and is received in a part cylindrical seat **36** formed in the upper surface of a block **37** formed on the outside of the bend of the frame **11**.

A clamping member **38** having a part cylindrical seat **39** engages over the upper part of the spigot and is secured to the block **37** on either side of the spigot by screws **40**. Loosening of the screws **40** permits the spigot to be rotated thereby rotating the support block **32** and the horseshoe magnets. The screws **40** can then be tightened to clamp the spigot in the chosen position. The purpose of this adjustment will be explained later.

The magnets **31** are arranged with like poles adjacent one another. Pole pieces **41, 42** bridge the respective like pairs of pole pieces and are secured thereto by screws **43**.

As can be clearly seen in FIG. 1 of the drawings the pole pieces **41** and **42** are located with their respective projecting fingers **50** adjacent to the end faces of the cylindrical member **28** with the end faces of the fingers spaced radially inwardly of the peripheral surfaces of the bands **29**.

The false twist spindle **53** which is made from steel extends parallel to the axis of the shaft **24** and is engaged by the bands **29** at two spaced locations. The spindle is formed with a peripheral flange **54** which extends into the groove **30** between the bands. The spindle is drawn into engagement with the bands by the adjacent magnetically attracting fingers the ends of which are spaced radially from the spindle by the drive wheel to provide airgaps, the magnetic circuit between the fingers being completed through the spindle. The spindle **53** is hollow and has a pin extending across its bore at one end, the yarn to be false twisted being passed through the bore and once or twice around the pin in accordance with well-known false twist practice.

As indicated earlier the horseshoe magnets are pivotally mounted in the frame **11** by means of the spigot **34** and the clamping means **37** and **38**. By rotation of the magnets the positions of the fingers **50** with respect to the bands can be adjusted so that the spindle can be held in a position in which it extends parallel to the axis of the cylindrical member **28** or inclined to the axis in either direction. Yarn tension tends to tilt the spindle in one direction and so the magnets are rotated to pretilt the spindle in the opposite direction so that in use yarn tension restores the spindle to a position in which it is parallel to the wheel axis.

The aforesaid baseplate **10** is formed with a hub **60** on the side of the step **13** remote from the frame **11** and projecting from the hub is a horizontally extending rod **61**. The rod **61** is received in a hollow cylindrical sleeve **62** which has a polytetrafluoroethylene lining. The sleeve is formed at the

upper end of a downwardly extending bracket **63**. A rod **64** is secured to the lower end of the bracket **63** which rod extends parallel to the rod **61** and is received with clearance in a bearing **65** located in the lower end of a plate **66** secured to the underside of the plate **10**. The baseplate **10** and with it the false twisting heads are thereby slidably mounted with respect to the bracket. The bracket **63** is secured by bolts **66** to one end of a member **67** of a frame for supporting a number of false twisting heads.

As shown in FIG. **3** of the drawings the sleeve **62** is formed on one side with an elongated closed slot **68** in which a pin **69** on the shaft **61** is slidable. Two pulley wheels **70**, **71** are rotatably mounted about horizontal axes on the sleeve adjacent the opposite ends of the slot **68** respectively.

It will be appreciated that engagement of the pin **69** with either end of the slot **68** limits the travel of the sliding movement of the head. The length of the slot is such that the sleeve **26** on the shaft **24** of the head can be disengaged from either of the sides of the aforesaid drive belt **9** by sliding movement of the head.

Secured to the pin **69** is one end of a wire tether **72** the other end of which is secured to a weight **73**. The wire tether can be led around either the wheel **70**, or the wheel **71** and the weight acts to draw the pin **69** towards the end of the slot adjacent to the wheel around which the wire is passed. The false twist head can thereby be urged in either direction of its sliding movement with respect to the fixed sleeve.

As shown in FIGS. **1** and **2** of the drawings a lever **74** is pivotally mounted at **75** on the opposite side of the sleeve **62** to the slot.

An upwardly extending plate **76** is secured by screws **77** to one side of the baseplate **10**. The plate **76** has sides which taper from a point adjacent the upper end of the plate to a point at the top of the plate. Fixed part way along one limb of the lever **74** is a projecting boss **78** which can be engaged with the lower part of one or other side of the cam plate **76** and thereby prevents sliding movement of the baseplate **10** and the false twist head in one or other direction. The arrangement is such that when the boss **78** is engaged with one or other of the sides of the cam plate **76** the false twist head is at one or other of the limits of its sliding movement.

The other limb of the lever **74** is provided with a resilient detent **79** which is engageable by swinging of the lever in one of two spaced holes **80**, **81** formed on the sleeve and located so that when the detent is engaged in the hole **80** the lever is positioned so that the boss **78** is engaged with one or other of the sides of the cam plate **76** and when the detent is engaged in the hole **81**, the lever is positioned so that the boss **78** is held clear of the cam plate **76**.

I claim:

1. In apparatus for false twisting yarn, the combination of a support, a false twisting head having a yarn engaging device, a rotatable drive shaft for driving said yarn engaging device on said support, an endless movable belt which is arranged for driving engagement with said shaft, guide means mounting said head on said support for sliding movement between a first position in which the shaft is on one side of the path of travel of the belt and a second position in which the shaft is on the other side of the path of travel, and means for selectively biasing the head towards one or other of those positions so that the shaft can be urged into engagement with one or other sides of the belt.

2. An apparatus as claimed in claim **1** wherein the guide means mounts the head for linear movement between said first and second positions.

3. In apparatus as claimed in claim **1**, weight means biasing the head is biased towards one or other of the two positions, a tether to one end of which the weight means is secured, the other end of the tether being anchored to the head, two guides mounted on the support at locations spaced apart in the direction of said movement, the tether being anchored to the head at a location between the two guides and being led around one or other of the guides so that the weight means acts to urge the head in one or other of said directions.

4. An apparatus as claimed in claim **3** wherein the two guides comprise rollers mounted on the support for rotation about horizontal axes extending transverse to said direction of movement of the head.

5. An apparatus as claimed in claim **1** wherein the guide means comprise a rod on said head and a sleeve on said support in which the rod is slidably engaged.

6. An apparatus as claimed in claim **5** wherein limit positions of sliding movement of the head are defined by the ends of a slot extending along the sleeve, a pin on the rod being slidable in said slot.

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