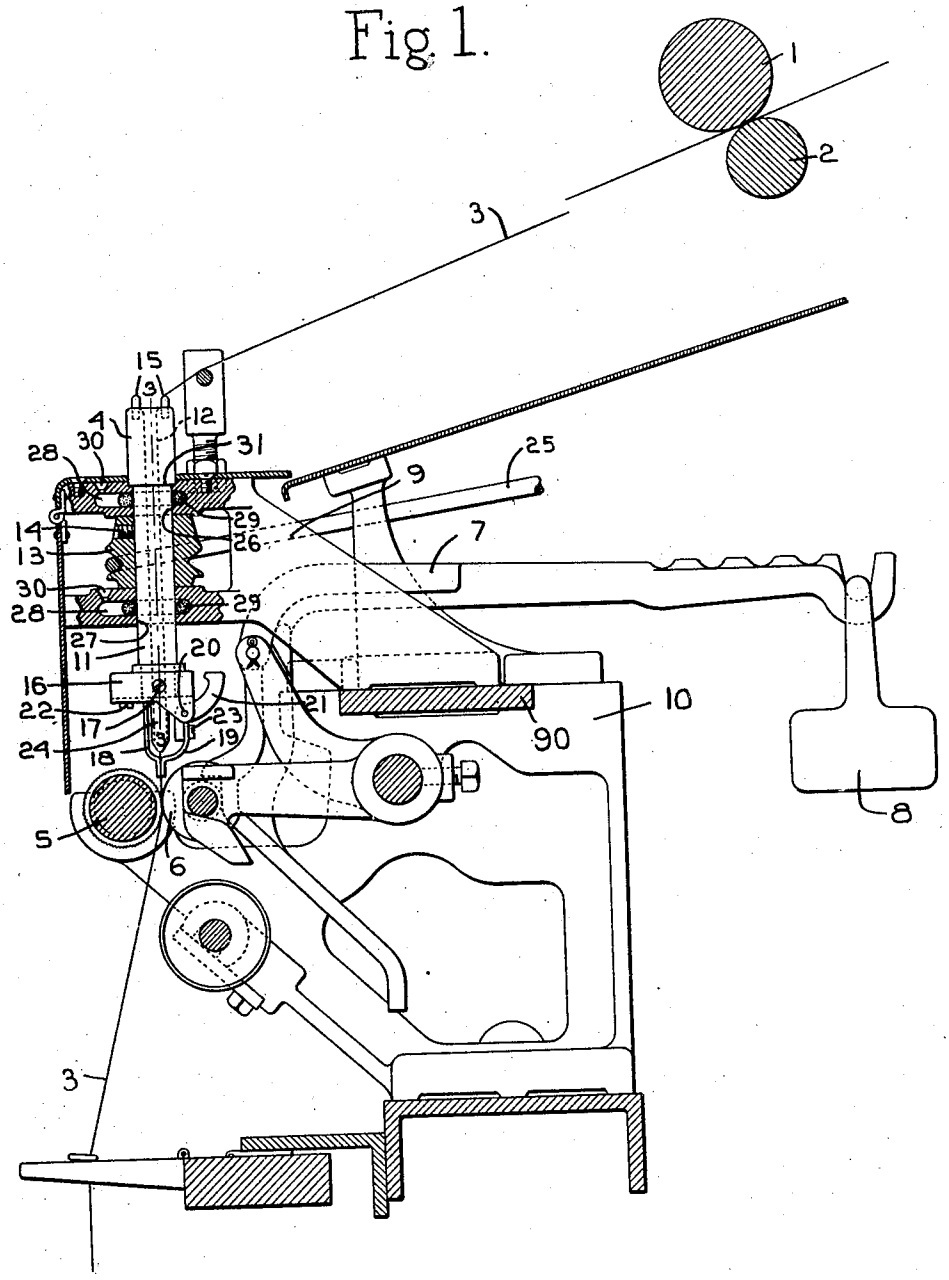
July 8, 1930. H. A. OWEN 1,770,085

TWISTER TUBE FOR SPINNING FRAMES

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Fig. 1.



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Fig. 2.

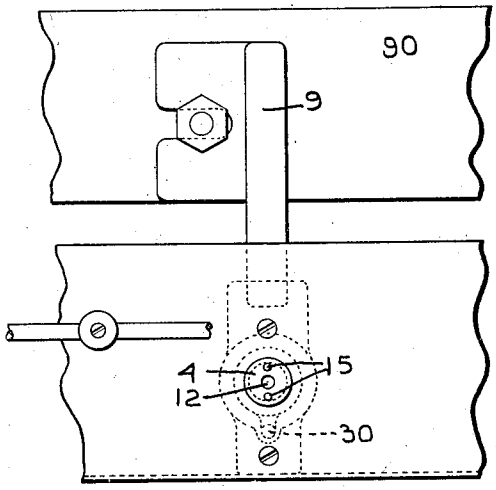


Fig. 3.

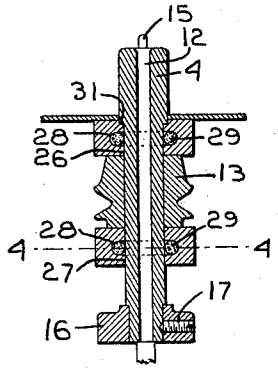
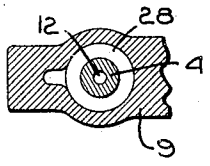


Fig. 4.



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UNITED STATES PATENT OFFICE

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TWISTER TUBE FOR SPINNING FRAMES

Application filed January 8, 1930. Serial No. 419,428.

This invention relates to spinning frames of the type in which a false twist is induced in the roving during the drawing operation, and particularly to improvements in the means employed to induce such twist, and has for its general object to provide a twister tube constructed in a manner to increase its operating efficiency.

A specific object of the invention is to provide a twister tube which rotates in completely closed cylindrical bearings.

A further specific object of the invention is to provide a tube which can be readily removed or replaced without disturbing or stretching the driving belt thereon.

A further object of the invention is to provide a twister tube having a totally enclosed lubricating system incorporating an efficient method of feeding lubricant directly to the journals on the tube.

A further object of the invention is to provide a safety device which limits the downward movement of the tube when making adjustments thereon.

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

In the drawings:

Fig. 1 is a cross sectional view through a portion of a spinning frame embodying a preferred form of the invention.

Fig. 2 is a plan view of a portion of the spinning frame illustrating the manner in which the twister tube is supported thereon.

Fig. 3 is a cross section on line 3—3 Fig. 1.

Fig. 4 is a sectional view on line 4—4 Fig. 3.

It is a well known fact that the spinning frame of the usual type fails to produce a high quality even run of yarn when spinning certain materials such, for instance, as woolen yarns. The introduction of a false twist into the roving while it is being drawn has been found greatly to increase the quality of the yarn. In order to maintain a uniform high quality in the product, the means used to produce the false twist must function uniformly. It is the purpose of the present invention to produce a twister tube which will function uniformly and with a minimum of attention.

To illustrate the construction and function of the tube, a portion only of a spinning frame including the elements associated with the twister tube is illustrated. The adaptation of the improvements included in the present invention to the elements not shown will be readily understood by those skilled in the art. A pair of feed rolls 1 and 2 deliver the roving 3 from a suitable source of supply, not shown, to the twister tube through which it is threaded and delivered therefrom to the bite of the draft rolls 5 and 6. The speed of the roll 5 with relation to the feed rolls 1 and 2 is varied to produce the required draft in the roving. Upon passing between the draft rolls the roving is given its final twist by means of a ring spinning mechanism, not shown. The roll 6 is held in yielding engagement with the roll 5 by means of the stirrup 7 actuated by the weight 8.

The twister tube itself must be provided with suitable means for engaging the roving and imparting a false twist thereto. Any suitable means for this purpose may be employed. The means illustrated and described herein is shown as of the type illustrated in the U. S. patent to Pease No. 983,641.

The general construction of the tube involves certain novel features. The complete tube assembly designated by 4 is supported in a specially constructed bracket 9 secured to a rail 90 mounted in the main frame 10. The tube 4 consists of a tubular body member 11 rotatably mounted in the bracket 9 and having an axial bore 12 therein. A whorl 13 is detachably secured to the bore member 11 in any suitable manner as by means of the set screw 14. The upper end of the member 11 is provided with pins 15 which intermittently engage the roving as it passes into the tube and assists in the uniform drawing thereof.

The lower end of the twister tube is provided with a detachable roving engaging and twisting head 16 secured thereto in any suitable manner as by means of a set screw 17. The set screw is preferably pointed at its inner end to be received by a properly positioned spot or recess on the end of the tube.

The head is thus positively retained in position when the set screw is tightened. Such construction also facilitates assembling the head on the tube since the spot definitely determines the correct position on the head on the tube. Other suitable means may, however, be employed to positively retain the head on the tube such for example as a removable straight or taper pin in which case the tube must be appropriately recessed to retain the pin. A desirable feature of such construction is that if the set screw or pin should become loosened during the running of the machine the head 16 will not immediately drop down but will be temporarily supported by the securing means and thus provide an opportunity for detecting the loose condition of such retaining means which condition may be remedied before any damage occurs.

The head 16 is provided with a pair of jaws 18 and 19 which have clamping faces disposed in axial alignment with the bore 12 of the tube and between which the roving passes to receive its temporary twist before entering the bite of the draft rolls 5 and 6. One or both of the jaws 18 and 19 are preferably yielding with relation to the other. As herein shown the jaw 18 is pivoted to the head at 20, and has an upper weighted arm 21. Since a relatively great amount of wear takes place at the clamping faces the jaws are desirably detachably secured to the head to provide for replacement. The jaw 18 is secured to the head by means of a screw 22. The jaw 19 is secured to its upper weighted arm section 21 by means of a screw 23. As the tube rotates the weighted arm is thrown outwardly by centrifugal force which rocks the jaw 19 about its pivot point 20 to grip the roving as it emerges from the tubular member 4.

If desired a guiding tube 24 may be secured to the head 16 in axial alignment with the bore 12 to direct the roving into the plane of the clamping faces of the jaws. As a result of the construction above described, the rotating parts of the twister tube assembly may be readily removed without disturbing any of the associated parts of the mechanism. By loosening the set screw 17 the head 16 may be removed from the end of the tubular member 4. The tubular member itself may now be removed by loosening the set screw 14 in the whorl and lifting endwise out of the bracket. It will be noted that the above feature is accomplished without moving the whorl laterally from its running position thus avoiding stretching or disturbing the driving belt 25.

It is common practice to mount a twister tube in bearings which are partially open usually at the front to permit the tube to be removed laterally forward. This method was necessitated chiefly because of the structure of the tube which prevented it from being removed endwise from its bearings. By removing the tube laterally from its bearings the driving belt must be manipulated in some manner to permit such removal either by stretching it or unfastening the splicing device. Furthermore the partial bearings in which the tube must rotate are very inefficient and render proper lubrication thereof very difficult. In the present invention the tube is supported in completely closed cylindrical bearings 26 and 27 above and below the whorl 13 respectively. Each of these bearings is provided with oil reservoirs 28 completely surrounding the tube and preferably situated in a plane intermediate of the plane of the upper and lower faces of the bearings. Preferably the reservoirs are provided with oil feeding wicks 29 which engage the periphery of the tube.

Each reservoir is also provided with a filling orifice 30 situated in a readily accessible position in front of the twister tubes. There is thus provided efficient bearings having an oil supply out of which no oil can escape except along the journals of the tubular member.

The distance of the jaws 18 and 19 from the bite of the rolls 5 and 6 must be accurately adjusted. In the present construction this is accomplished by loosening the set screw 14 in the whorl 13 and moving the tubular member axially until the proper adjustment is secured after which the set screw is tightened. The weight of the tubular member with its clamping head is thus supported by the whorl, the lower face of which engages the upper face of the bearing 27.

In order to prevent accidental engagement of the clamping jaws with the draft rolls, means are provided to limit the extent to which the tube may descend in its bearings. If the set screw 14 should become loosened while the machine is running or if the operator is careless in adjusting the tube a stop shoulder 31 on the tubular member is provided and so positioned that it will stop the downward motion of the tube just before the jaws 18 and 19 engage with the rolls 5 and 6. Damage to the machine is thereby positively prevented. The upper bearing 26 is slightly countersunk on its upper face to form a sunken bearing face upon which the stop shoulder 31 may rest. When the proper height of the jaws above the rolls 5 and 6 has been determined, there may be a slight space between the shoulder and its co-operating bearing face on the bearing 26. If such a space exists above the surface of the bearing there would be a tendency for foreign matter such as fibres and lint to accumulate therein. Furthermore should the roving become accidentally wound in the space the elements of the tube would have to be disassembled and

cleared to again establish a free running tube. By locating the bearing surface for the shoulder 31 below the face of the bearing the difficulties which arise due to the presence, adjacent the roving, of a shoulder bearing upon or near a co-operating bearing face are eliminated.

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

1. A spinning frame comprising drawing rolls, a closed cylindrical bearing, a twister tube having a tubular body member through which the roving is threaded rotatably mounted in and axially removable upward from said bearing, a whorl detachably secured to said body member, a frame detachably secured to the lower end of said body member to permit the axial upward removal of said member and means on said frame to engage the roving as it emerges from the bottom of said body member and impart a false twist thereto adjacent the bite of the rolls.

2. A spinning frame comprising drawing rolls, a closed cylindrical bearing, a twister tube having a tubular member through which the roving is threaded rotatably mounted in and axially removable upward from said bearing, a whorl slidable longitudinally of said body member, means detachably to secure said whorl thereto, a driving belt on said whorl, a detachable roving engaging and twisting head extending adjacent the bite of the rolls and secured to the end of said tubular member, whereby the various elements thereof may be removed or installed without disturbing or stretching said driving belt by detaching said roving engaging and twisting head, loosening the means securing the whorl to said body member, and removing said body member axially from its bearings upwardly away from said rolls.

3. In a spinning frame, drawing rolls, a bracket mounted on the frame having closed cylindrical bearings extending substantially perpendicular to the rolls, a twister tube having a tubular body member through which the roving is threaded rotatably mounted in and axially removable upward away from said rolls from said bearings and a detachable roving engaging and twisting head extending adjacent the bite of the rolls and secured to the lower end of said tubular body member, said roving engaging head being of a size incapable of passing through said cylindrical bearings.

4. In a spinning frame, drawing rolls, a bracket mounted on the frame having closed cylindrical bearings, disposed on an axis intersecting the bite of the rolls, a twister tube having a tubular body member through which the roving is threaded rotatably mounted in and axially removable from said bearings upward and away from the rolls, a whorl between said bearings detachably secured to said tubular body member and slidable longitudinally thereon, a detachable head of a size incapable of passing through said bearings secured to the lower end of said tubular body member engaging and twisting the roving as it issues from said tubular member and enclosed oil reservoirs in said bearings situated intermediate the upper and lower faces thereof.

5. In a spinning frame, the elements defined in claim 4 together with extensions on each of said bearings projecting forwardly and having filling orifices therein communicating with the oil reservoirs.

6. In a spinning frame, the elements defined in claim 4 together with oil feeding wicks within the oil reservoirs engaging substantially the full periphery of the tubular member.

7. In a spinning frame, drawing rolls, a bracket mounted on the frame having closed upper and lower cylindrical bearings, disposed on an axis intersecting the bite of the rolls, a twister tube having a tubular body member with a stop shoulder thereon rotatably mounted in and axially removable from said bearings away from said rolls, a bearing face on said upper bearing to be engaged by said stop shoulder acting to limit the downward movement of said tubular member, a whorl slidable on and detachably secured to said tubular member between said upper and lower bearings and a detachable roving engaging and twisting head secured to the lower end of said tubular member and of a size incapable of passing through said bearings.

8. In a spinning frame, a bracket mounted on the frame having closed upper and lower cylindrical bearings, a twister tube having a tubular body member with a stop shoulder thereon rotatably mounted in and axially removable from said bearings, a countersunk bearing face in said upper bearing to be engaged by said stop shoulder to limit the downward movement of said tubular body member, a whorl slidable on and detachably secured to said tubular member between said upper and lower bearings and a detachable roving engaging twisting head secured to the lower end of said tubular member.

9. A spinning frame comprising drawing rolls, a closed cylindrical bearing, a twister tube having a tubular body member through which the roving is threaded rotatably mounted in and axially removable from said bearing upward and away from said drawing rolls, a whorl detachably secured to said body member of a size incapable of passing through said bearings, a frame on the lower end of said body member, a recess in the lower end of said body member, means in the frame adapted to enter said recess and act

positively to retain the frame on said body member, and means on said frame to engage the roving as it emerges from the bottom of said body member and impart a false twist thereto adjacent the bite of the rolls.

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

HENRY A. OWEN.