Dec. 30, 1952 A. O. BISHOP 2,623,347

APPARATUS FOR SPINNING TEXTILE FIBERS AND THE LIKE

Filed Oct. 10, 1949 2 SHEETS—SHEET 1

FIG. 1.

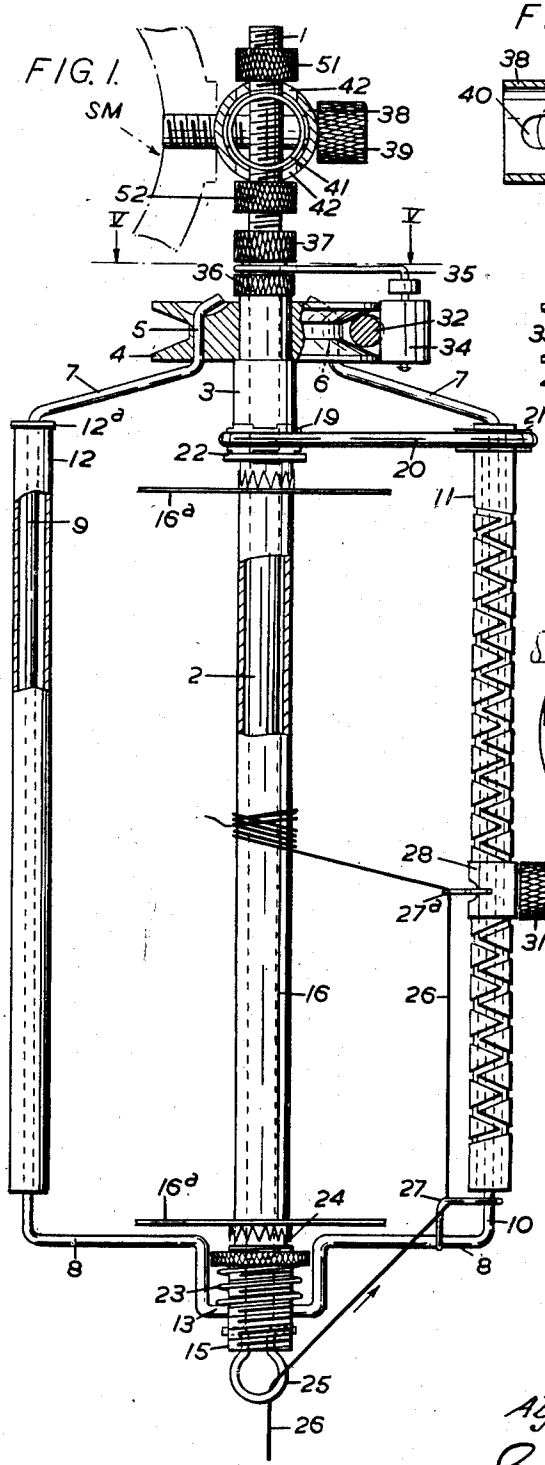


FIG. 6.

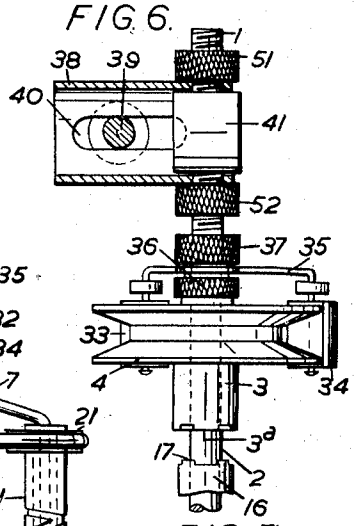


FIG. 5.

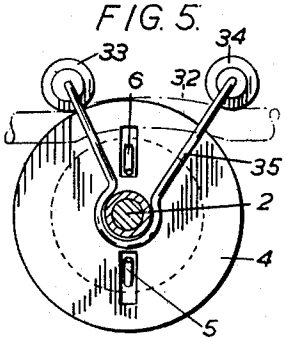


FIG. 3.

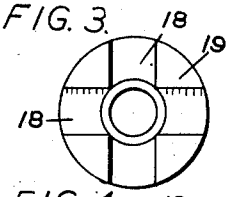
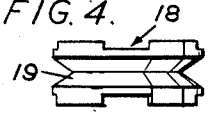


FIG. 4.



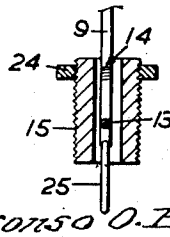


FIG. 2.

Inventor

Alfonso O. Bishop

By

Attorney

Dec. 30, 1952 A. O. BISHOP 2,623,347

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FIG. 7.

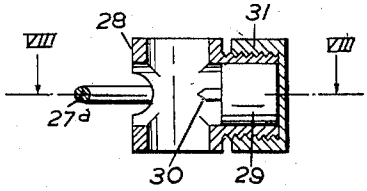


FIG. 8.

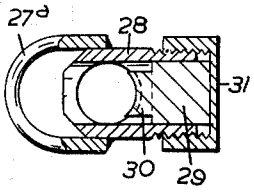


FIG. 12.

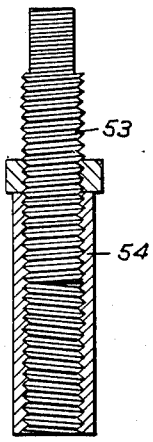


FIG. 13.

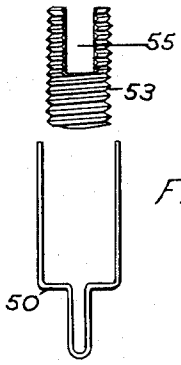


FIG. 11.

FIG. 9.

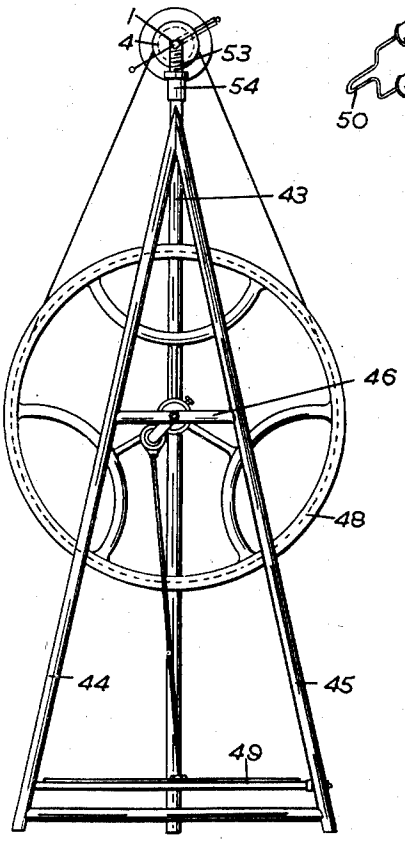
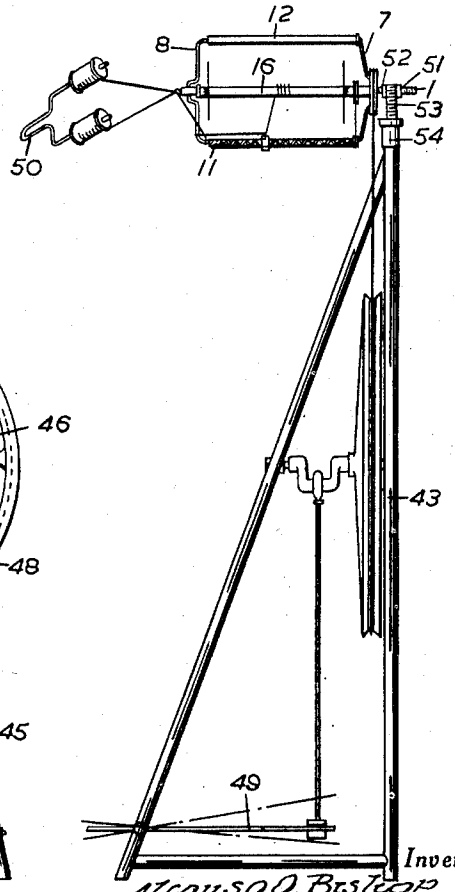


FIG. 10.



Inventor
Alfonso O. Bishop
By
Attorney

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UNITED STATES PATENT OFFICE

2,623,347

APPARATUS FOR SPINNING TEXTILE FIBERS AND THE LIKE

Alfonso Obispo Bishop, Madrid, Spain

Application October 10, 1949, Serial No. 120,518
In Great Britain July 1, 1949

15 Claims. (Cl. 57—70)

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This invention relates to apparatus for spining textile fibres such as wool, flax and the like or for twisting two or more threads to form a single thread. Such operations will hereinafter and in the appended claims be generically referred to as spinning.

The apparatus according to the present invention is adapted as an attachment to be applied to a sewing machine, a spinning machine or other suitable device provided with driving means to permit hand spinning operations to be performed when using apparatus.

Hand spinning attachments known prior to the present invention have not been provided with automatic twist regulating devices or with a distributor capable of distributing thread lengthwise of a spool whilst it is being wound thereon.

It is an object of the present invention to provide a hand spinning attachment having a twist regulating device so that the thread produced may be predetermined by the quality of the material to be spun, the kind of thread required and the skill and experience of the operator.

A further object of the invention is to provide in a hand spinning attachment means for automatically spooling spun thread and for distributing it lengthwise on a spool.

According to the invention there is provided for spinning textile fibres such as wool, flax and the like, apparatus for attachment to a sewing machine, a spinning machine, or other device provided with means to effect rotation of a member supported thereon for rotation about a longitudinal axis, comprising a spindle adapted to be secured in fixed relation to said machine or device, a frame having diametrically opposed elements parallel with and rotatable about the axis of the spindle, a tube disposed within the frame for rotation about the axis of the spindle, a first thread guide rotatable about the axis of said spindle, a second thread guide supported by the frame for movement therewtih to guide a thread on to the tube, and check means acting against an end of the tube to apply axial pressure thereon and thereby determine the relative angular velocity between the tube and the frame for the purpose of regulating the twist applied to a thread being spun. The check means may comprise a bush concentric with the axis of said spindle and slidable axially relative to the frame a regulating nut on said bush and a spring acting between the frame and said nut to urge the bush into endwise abutment with the tube.

In a preferred embodiment of the invention the second thread guide is carried by a distributor mounted for reciprocation lengthwise of said element in timed relation with the rotation of said tube to effect spooling of a thread lengthwise of the tube.

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In order that the invention may be more clearly understood an embodiment thereof will now be described by way of example with reference to the accompanying drawings in which,

Figure 1 is an elevation partly in section of apparatus constructed in accordance with the invention,

Figure 2 is a fragmentary cross-sectional view of a part of Figure 1 taken on a plane perpendicular to Figure 1.

Figure 3 is a plan, to an enlarged scale, of a detail of Figure 1,

Figure 4 is a side elevation of Figure 3,

Figure 5 is a section on line V—V, Fig. 1 and shows a belt tensioning device fitted to the apparatus.

Figure 6 is an elevation of Figure 5, partly in section,

Figure 7 is a sectional view, to an enlarged scale, of the thread distributor,

Figure 8 is a plan, partly in section, of Figure 7,

Figure 9 is a diagrammatic front elevation of a stand or tripod with the spinning apparatus fitted thereto,

Figure 10 is a side view of Figure 9,

Figure 11 is a view of a hand guide,

Figure 12 is a sectional elevation, to an enlarged scale, of a detail of Fig. 10, and

Figure 13 is an elevation of a part of the detail shown in Fig. 12.

Referring to the drawings, the screw threaded end 1 of a fixed spindle 2 is screwed into a bearing sleeve 3. A driving pulley 4 is mounted on the bearing sleeve 3 to be freely rotatable thereon and is provided with diametrically opposite holes in which the end portions 5 and 6 of a resilient rod or wire are located the end portions being overturned to retain them in position.

The resilient rod or wire is of circular cross section and as can be seen from Figure 1 is bent to form a four-sided frame consisting of two ends 7 and 8 and two diametrically opposed sides 9 and 10. Surrounding the side 10 of the frame and extending lengthwise thereof is a sleeve 11 referred to in greater detail below and surrounding the side 9 of the frame is a balance weight 12.

The end 8 of the frame is provided with a U-shaped portion 13 the base of which is located in a slot 14, see Figure 2, formed lengthwise in a bush 15 thus preventing axial rotation of the bush

relative to the frame. The plain end of the spindle 2 is located in the bush 15.

A tube 16 surrounds the spindle 2 and at one end abuts against the end of the bush 15. The opposite end of the tube is provided with projections 17, see Figure 6, which in some circumstances as explained below engage in notches 18, Figure 4, formed in a coupling element which comprises a small pulley 19 freely rotatable on the spindle 2. The pulley 19 is connected by a belt 20 to a pulley 21 fixed on the sleeve 11. When the projections 17 are not engaged with the notches 18 their engagement is prevented by a leather washer 22 as shown in Figure 1.

The tube is urged lengthwise into engagement with the notches 18 or with the washer 22 by a spring 23 disposed round the bush 15 the spring acting between the base of the U-shaped portion 13 and a regulating nut 24 screwed on to the bush 15. By adjusting the nut 24 on the bush 15 the axial pressure on the tube 16 can be varied thus determining the relative angular velocity between the tube 16 and the frame.

A bent resilient wire 25 is associated with the bush 15 having its end anchored in the slot 14 in the bush. As can be seen from Figure 1 the material 26 to be spun is passed through the first thread guide formed by the wire 25 and then through a second thread guide 27*a* secured to a distributor 28 mounted on the sleeve 11, and is then led on to the tube 16 on which it is to be wound. If desired, a still further thread guide 27 may be provided between the first and second guides, such further guide 27 being fixed to the side 10 of the resilient frame.

The sleeve 11 is provided with a left and a right hand thread which threads are joined at the opposite ends of the sleeve so that when the sleeve is rotated by the belt 20 the distributor 28 is reciprocated lengthwise of the sleeve and distributes the yarn 26 along the length of the tube 16. Connection between the distributor and the threads on the sleeve 11 is effected by a cylindrical member 29, Figures 7 and 8, housed in the distributor and provided with a tooth 30 which engages in the threads formed in the sleeve 11. A cover 31 is screwed on to the distributor and retains the member 29 in position. This cover also permits manual adjustment of the distributor to be effected.

As mentioned above rotation of the frame is effected by the pulley 4, this being driven by a belt 32 which may comprise the driving belt of a sewing machine or, as shown in Figure 9, the belt of a tripod device having a crank driven driving wheel. When the apparatus is attached to a sewing machine the belt 32 may be tensioned by the device shown in Figures 5 and 6. This device consists of two rollers 33, 34 carried at the ends of a carrier 35 made of resilient wire. The carrier is clamped between a pair of nuts 36, 37 screwed on to the fixed spindle 2, the nut 36 also acting to retain the pulley 4 in position on the sleeve 3.

When the spinning apparatus is to be attached to a sewing machine as indicated at S. M., Figure 1, it is provided with a tubular support 38 and a screw 39 by which it is secured to a shoulder on the sewing machine which shoulder is adapted for the mounting of the crank handle of the sewing machine. A slot 40 in the support 38 permits the apparatus to be located at the most convenient working height and a centering tube 41 inside the support 38 permits the angular adjustment of the apparatus, slots 42 through which the end 1 of the spindle 2 passes being provided to permit of this adjustment. The spindle 2 is retained in fixed position relative to the support 38 by clamping nuts 51, 52.

Referring to Figures 9 to 11 the spinning apparatus is shown mounted at the upper end of a tripod the feet of which are disposed to be at the corners of a base area defined by an equitriangle. One leg 43 of the tripod is vertical and the others, 44, 45, slope as shown in Figure 10. A cross bar 46 and the leg 43 provide bearings for a crank shaft 47 carrying a driving wheel 48 the crank shaft being operable by a treadle 49 in well-known manner. The spinning apparatus is attached to the leg 43 by a support 53 screwed into a socket 54 fitted to the top of the leg 43, the upper end of the support being slotted at 55 to receive the end 1 of the spindle 2 and nuts 51 and 52 retain the apparatus in position relative to the tripod.

In Figure 11 there is shown a hand guide 50 which is provided for use as shown in Figure 10. Two loaded tubes are supported by prongs on the hand guide which is held by the operator in the position shown in Figure 10, the threads being passed through the first thread guide 25 and led on to the tube 16 as described above. The two threads thus fed to the first thread guide are twisted together so as to form a single thread of greater strength than the two individual threads.

In operation the frame is rotated about the longitudinal axis of the fixed spindle 2 by the belt 32 acting on the pulley 4. The fibres to be spun are fed by hand in known manner to the first thread guide 25 which rotates with the frame and about the axis of the spindle 2. The second thread guide 27*a* moves with the frame and the tension or draw of the thread tends to cause rotation of the tube 16 about the axis of the spindle 2 at the same angular velocity as that of the frame. In these circumstances the thread is only slowly wound on to the tube 16 and has a maximum twist. By suitably adjusting the regulating nut 24 however, to increase the pressure exerted by the spring 23 the rotation of the tube 16 is retarded by the washer 22 and the rate of winding and consequently the degree of twist imparted to the thread is varied. This adjustment of the nut 24 is effected by the operator according to his skill and experience to obtain the desired quality of the spun thread.

During the rotation of the frame the pulley 19 is stationary because it is directly coupled by projections 3*a* on the sleeve 3 which, as stated above, is screwed on to the fixed rod 2. The belt 20, however, effects rotation of the pulley 21 and sleeve 11 about the side 10 of the frame and the distributor 28 is thus reciprocated lengthwise of the sleeve 11 and the thread is wound along the length of the tube 16.

When the leather washer 22 is disposed to be between the pulley 19 and the sleeve 3 the pulley 19 is directly coupled by notches 18 and projections 17 to the tube 16 and therefore rotates at the same angular velocity as that of the tube. The distributor is then moved more slowly than when the washer 22 is disposed as shown in Figure 1 and the spooling of the thread will accordingly be less crossed.

When the washer 22 is removed the pulley 19 will be directly coupled to the tube 16 and to the sleeve 3 and rotation of the tube 16 will be prevented. The thread will then be wound very rapidly on to the tube 16.

The replacement of a filled tube 16 by an empty tube or the adjustment of the washer 22 may be readily effected by pulling the bush 15 downwards as viewed in Figure 1 until the plain end of the spindle 2 is exposed. The frame can then be sprung sideways about its ends 5 and 6 and the tube 16 withdrawn from the spindle 2. With the tube removed the washer 22 and the pulley 19 can also be removed and replaced in the desired relationship.

When the apparatus is to be employed to wind thread on to a tube 16 to be used as a shuttle rotation of the frame is interrupted and the tube is fitted with two discs 16a between which the thread is wound by leading the distributor 28 along the sleeve 11 while manually rotating the sleeve. To permit this the belt 20 is removed from the pulleys 19 and 21 and by passing it round the bush 15, disconnecting the bush 15 and passing the belt between the bush and the end of the spindle 2, said belt can be located between the pulley 19 and the counterweight 12. A flange 12a on the counterweight prevents the belt from slipping off the end thereof.

If the regulating nut 24 should have been so adjusted that the spring 23 will compress no further it is still possible, due to the resiliency of the frame, to deform the frame by pressure exerted by further adjustment of the nut 24 so that the frame compresses the bush 15 against the tube 16 and the base of the U-shaped portion 13 approaches the first thread guide 25. This will cause the frame to bulge and to permit of this the internal diameter of the sleeve 11 must be greater than the diameter of the resilient wire forming the frame.

What I claim is:

1. For spinning textile fibres such as wool, flax and the like, apparatus for attachment to a sewing machine, a spinning machine, or other device provided with means to effect rotation of a member supported thereon for rotation about a longitudinal axis, comprising a spindle adapted to be secured in fixed relation to said machine or device, a resilient frame having diametrically opposed elements parallel with and rotatable about said spindle, a tube disposed within the frame for rotation about said spindle, a first thread guide rotatable about the axis of said spindle, a second thread guide supported by the frame for movement therewith to guide a thread on to the tube, and check means acting against an end of the tube to apply axial pressure thereon and thereby determine the relative angular velocity between the tube and the frame for the purpose of regulating the twist applied to a thread being spun.

2. For spinning textile fibres such as wool, flax and the like, apparatus for attachment to a sewing machine, a spinning machine, or other device provided with means to effect rotation of a member supported thereon for rotation about a longitudinal axis, comprising a spindle adapted to be secured in fixed relation to said machine or device, a resilient frame having diametrically opposed elements parallel with and rotatable about said spindle, a tube disposed within the frame for rotation about the axis of the spindle, a first thread guide rotatable about the axis of said spindle, a second thread guide supported by the frame for movement therewith to guide a thread on to the tube, a bush concentric with the axis of said spindle and slidable axially relative to the frame, a regulating nut on said bush, and a spring acting between the frame and said nut to urge the bush into endwise abutment with said tube.

3. For spinning textile fibres such as wool, flax and the like, apparatus for attachment to a sewing machine, a spinning machine, or other device provided with means to effect rotation of a member supported thereon for rotation about a longitudinal axis, comprising a spindle adapted to be secured in fixed relation to said machine or device, a resilient frame having diametrically opposed elements parallel with and rotatable about said spindle, a tube disposed within the frame for rotation about the axis of the spindle, a first thread guide rotatable about the axis of said spindle, a second thread guide, a distributor supporting said second thread guide and mounted for reciprocation lengthwise of one of said diametrically opposed elements in timed relation with the rotation of said tube to effect spooling of a thread lengthwise of the tube, and check means acting against an end of the tube to apply axial pressure thereon and thereby determine the relative angular velocity between the tube and the frame for the purpose of regulating the twist applied to a thread being spun.

4. For spinning textile fibres such as wool, flax and the like, apparatus for attachment to a sewing machine, a spinning machine, or other device provided with means to effect rotation of a member supported thereon for rotation about a longitudinal axis, comprising a spindle adapted to be secured in fixed relation to said machine or device, a resilient frame having diametrically opposed elements parallel with and rotatable about said spindle, a tube disposed within the frame for rotation about the axis of the spindle, a first thread guide rotatable about the axis of said spindle, a second thread guide, a distributor supporting said second thread guide and mounted for reciprocation lengthwise of one of said diametrically opposed elements in timed relation with the rotation of said tube to effect spooling of a thread lengthwise of the tube, a bush concentric with the axis of said spindle and slidable axially relative to the frame, a regulating nut on said bush, and a spring acting between the frame and said nut to urge the bush into endwise abutment with said tube.

5. For spinning textile fibres such as wool, flax and the like, apparatus for attachment to a sewing machine, a spinning machine, or other device provided with means to effect rotation of a member supported thereon for rotation about a longitudinal axis, comprising a spindle adapted to be secured in fixed relation to said machine or device, a resilient frame having diametrically opposed elements parallel with and rotatable about said spindle, a tube disposed within the frame for rotation about the axis of the spindle, a first thread guide rotatable about the axis of said spindle, a second thread guide, a sleeve surrounding one of said diametrically opposed elements and having external left and right hand screw threads, a distributor supporting said second thread guide and mounted on said sleeve for reciprocation lengthwise thereof by said screw threads in timed relation with the rotation of said tube to effect spooling of a thread lengthwise of the tube, and check means acting against an end of the tube to apply axial pressure thereon and thereby determine the relative angular velocity between the tube and the frame for the purpose of regulating the twist applied to a thread being spun.

6. For spinning textile fibres such as wool, flax

and the like, apparatus for attachment to a sewing machine, a spinning machine, or other device provided with means to effect rotation of a member supported thereon for rotation about a longitudinal axis, comprising a spindle adapted to be secured in fixed relation to said machine or device, a resilient frame having diametrically opposed elements parallel with and rotatable about said spindle, a tube disposed within the frame for rotation about the axis of the spindle, a first thread guide rotatable about the axis of said spindle, a second thread guide, a sleeve surrounding one of said diametrically opposed elements and having external left and right hand screw threads, a distributor supporting said second thread guide and mounted on said sleeve for reciprocation lengthwise thereof by said screw threads in timed relation with the rotation of said tube to effect spooling of a thread lengthwise of the tube, a bush concentric with the axis of said spindle and slidable axially relative to the frame, a regulating nut on said bush, and a spring acting between the frame and said nut to urge the bush into endwise abutment with said tube.

7. For spinning textile fibres such as wool, flax and the like, apparatus for attachment to a sewing machine, a spinning machine, or other device provided with means to effect rotation of a member supported thereon for rotation about a longitudinal axis, comprising a spindle adapted to be secured in fixed relation to said machine or device, a resilient frame having diametrically opposed elements parallel with and rotatable about said spindle, a tube disposed within the frame for rotation about the axis of the spindle, a first thread guide rotatable about the axis of said spindle, a second thread guide, a distributor supporting said second thread guide and mounted for reciprocation lengthwise of one of said diametrically opposed elements in timed relation with the rotation of said tube to effect spooling of a thread lengthwise of the tube, means to control the rate of reciprocation of the distributor in relation to the angular velocity of the tube, and check means acting against an end of the tube to apply axial pressure thereon and thereby determine the relative angular velocity between the tube and the frame for the purpose of regulating the twist applied to a thread being spun.

8. For spinning textile fibres such as wool, flax and the like, apparatus for attachment to a sewing machine, a spinning machine, or other device provided with means to effect rotation of a member supported thereon for rotation about a longitudinal axis, comprising a spindle adapted to be secured in fixed relation to said machine or device, a resilient frame having diametrically opposed elements parallel with and rotatable about said spindle, a tube disposed within the frame for rotation about the axis of the spindle, a first thread guide rotatable about the axis of said spindle, a second thread guide, a distributor supporting said second thread guide and mounted for reciprocation lengthwise of one of said diametrically opposed elements in timed relation with the rotation of said tube to effect spooling of a thread lengthwise of the tube, means to control the rate of reciprocation of the distributor in relation to the angular velocity of the tube, a bush concentric with the axis of said spindle and slidable axially relative to the frame, a regulating nut on said bush, and a spring acting between the frame and said nut to urge the bush into endwise abutment with said tube.

9. For spinning textile fibres such as wool, flax and the like, apparatus for attachment to a sewing machine, a spinning machine, or other device provided with means to effect rotation of a member supported thereon for rotation about a longitudinal axis, comprising a spindle adapted to be secured in fixed relation to said machine or device, a resilient frame having diametrically opposed elements parallel with and rotatable about said spindle, a tube disposed within the frame for rotation about the axis of the spindle, a first thread guide rotatable about the axis of said spindle, a second thread guide, a sleeve surrounding one of said diametrically opposed elements and having external left and right hand screw threads, a distributor supporting said second thread guide and mounted on said sleeve for reciprocation lengthwise thereof by said screw threads in timed relation with the rotation of said tube to effect spooling of a thread lengthwise of the tube, means to control the rate of reciprocation of the distributor in relation to the angular velocity of the tube, and check means acting against an end of the tube to apply axial pressure thereon and thereby determine the relative angular velocity between the tube and the frame for the purpose of regulating the twist applied to a thread being spun.

10. For spinning textile fibres such as wool, flax and the like, apparatus for attachment to a sewing machine, a spinning machine, or other device provided with means to effect rotation of a member supported thereon for rotation about a longitudinal axis, comprising a spindle adapted to be secured in fixed relation to said machine or device, a resilient frame having diametrically opposed elements parallel with and rotatable about said spindle, a tube disposed within the frame for rotation about the axis of the spindle, a first thread guide rotatable about the axis of said spindle, a second thread guide, a distributor supporting said second thread guide and mounted for reciprocation lengthwise of one of said diametrically opposed elements in timed relation with the rotation of said tube to effect spooling of a thread lengthwise of the tube, a compressible washer, a bearing sleeve concentric with said spindle and secured against angular movement relative thereto, a pulley freely rotatable about said bearing sleeve, means operated by said pulley to effect reciprocation of said distributor, said means including a coupling element located between said pulley and washer for free rotation about said spindle and having notches formed in opposite sides thereof, projections extending from said bearing sleeve and from said tube for co-operation with said notches whereby positive engagement may be selectively effected between the bearing sleeve and tube, the relative disposition of said compressible washer and pulley with respect to the tube determining the rate of reciprocation of the distributor, and check means acting against an end of the tube to apply axial pressure thereon and thereby determine the relative angular velocity between the tube and the frame for the purpose of regulating the twist applied to a thread being spun.

11. For spinning textile fibres such as wool, flax and the like, apparatus for attachment to a sewing machine, a spinning machine, or other device provided with means to effect rotation of a member supported thereon for rotation about a longitudinal axis, comprising a spindle adapted to be secured in fixed relation to said machine or device, a resilient frame having diametrical-

ly opposed elements parallel with and rotatable about said spindle, a tube disposed within the frame for rotation about the axis of the spindle, a first thread guide rotatable about the axis of said spindle, a second thread guide, a distributor supporting said second thread guide and mounted for reciprocation lengthwise of one of said diametrically opposed elements in timed relation with the rotation of said tube to effect spooling of a thread lengthwise of the tube, a compressible washer, a bearing sleeve concentric with said spindle and secured against angular movement relative thereto, a pulley freely rotatable about said bearing sleeve, means operated by said pulley to effect reciprocation of said distributor, said means including a coupling element located between said pulley and washer for free rotation about said spindle and having notches formed in opposite sides thereof, projections extending from said bearing sleeve and from said tube for co-operation with said notches whereby positive engagement may be selectively effected between the bearing sleeve and tube, the relative disposition of said compressible washer and pulley with respect to the tube determining the rate of reciprocation of the distributor, a bush concentric with the axis of said spindle and slidable axially relative to the frame, a regulating nut on said bush, and a spring acting between the frame and said nut to urge the bush into endwise abutment with said tube.

12. For spinning textile fibres such as wool, flax and the like, apparatus for attachment to a sewing machine, a spinning machine, or other device provided with means to effect rotation of a member supported thereon for rotation about a longitudinal axis, comprising a spindle adapted to be secured in fixed relation to said machine or device, a resilient frame having diametrically opposed elements parallel with and rotatable about said spindle, a tube disposed within the frame for rotation about the axis of the spindle, a first thread guide rotatable about the axis of said spindle, a second thread guide, a sleeve surounding one of said diametrically opposed elements and having external left and right hand screw threads, a distributor supporting said second thread guide and mounted on said sleeve for reciprocation lengthwise thereof by said screw threads in timed relation with the rotation of said tube to effect spooling of a thread lengthwise of the tube, a compressible washer, a bearing sleeve concentric with said spindle and secured against angular movement relative thereto, a pulley freely rotatable about said bearing sleeve, means connecting said sleeve with said pulley for rotation thereby, said means including a coupling element located between said pulley and washer for free rotation about said spindle and having notches formed in opposite sides thereof, projections extending from said bearing sleeve and from said tube for co-operation with said notches whereby positive engagement may be selectively effected between the bearing sleeve and tube, the relative disposition of said compressible washer and pulley with respect to the tube determining the rate of reciprocation of the distributor, a bush concentric with the axis of said spindle and slidable axially relative to the frame, a regulating nut on said bush, and a spring acting between the frame and said nut to urge the bush into endwise abutment with said tube.

13. For spinning textile fibres such as wool, flax and the like, apparatus for attachment to a sewing machine, comprising a tubular support slotted lengthwise thereof to receive a fixing screw by which it is to be secured in fixed relation to said machine, a spindle extending through the tubular support and having its axis transverse to the axis of the tubular support, a centering tube embracing said spindle and disposed within the tubular support to permit angular adjustment of the spindle relative to the support, means to lock the spindle in fixed relation with the support, a resilient frame having diametrically opposed elements parallel with and rotatable about said spindle, a tube disposed within the frame for rotation about said spindle, a first thread guide rotatable about the axis of said spindle, a second thread guide supported by the frame for movement therewith to guide a thread on to the tube, and check means acting against an end of the tube to apply axial pressure thereon and thereby determine the relative angular velocity between the tube and the frame for the purpose of regulating the twist applied to a thread being spun.

14. For spinning textile fibres such as wool, flax and the like, apparatus for attachment to a sewing machine, comprising a tubular support slotted lengthwise thereof to receive a fixing screw by which it is to be secured in fixed relation to said machine, a spindle extending through the tubular support and having its axis transverse to the axis of the tubular support, a centering tube embracing said spindle and disposed within the tubular support to permit angular adjustment of the spindle relative to the support, means to lock the spindle in fixed relation with the support, a resilient frame having diametrically opposed elements parallel with and rotatable about said spindle, a tube disposed within the frame for rotation about the axis of the spindle, a first thread guide rotatable about the axis of said spindle, a second thread guide, a sleeve surrounding one of said diametrically opposed elements and having external left and right hand screw threads, a distributor supporting said second thread guide and mounted on said sleeve for reciprocation lengthwise thereof by said screw threads in timed relation with the rotation of said tube to effect spooling of a thread lengthwise of the tube, a bush concentric with the axis of said spindle and slidable axially relative to the frame, a regulating nut on said bush, and a spring acting between the frame and said nut to urge the bush into endwise abutment with said tube.

15. For spinning textile fibres such as wool, flax and the like, apparatus for attachment to a sewing machine, a spinning machine, or other device provided with means to effect rotation of a member supported thereon for rotation about a longitudinal axis, comprising a spindle adapted to be secured in fixed relation to said machine or device, a resilient frame having diametrically opposed elements parallel with and rotatable about said spindle, a tube disposed within the frame for rotation about the axis of the spindle, a first thread guide rotatable about the axis of said spindle, a second thread guide, a distributor supporting said second thread guide and mounted for reciprocation lengthwise of one of said diametrically opposed elements in timed relation with the rotation of said tube to effect spooling of a thread lengthwise of the tube, a compressible washer, a bearing sleeve concentric with said spindle and secured against angular movement relative thereto, a pulley freely rotatable about

said bearing sleeve for rotation by a belt driven from said machine, a resilient wire carrier, clamping means on said spindle to retain the wire carrier in position relative to said pulley, rollers carried by the ends of said carrier and supported thereby to tension the belt driving the pulley, means operated by said pulley to effect reciprocation of said distributor, said means including a coupling element located between said pulley and washer for free rotation about said spindle and having notches formed in opposite sides thereof, projections extending from said bearing sleeve and from said tube for co-operation with said notches whereby positive engagement may be selectively effected between the bearing sleeve and tube, the relative disposition of said compressible washer and pulley with respect to the tube determining the rate of reciprocation of the distributor, and check means acting against an end of the tube to apply axial pressure thereon and thereby determine the relative angular velocity between the tube and the frame for the purpose of regulating the twist applied to a thread being spun.

ALFONSO OBISPO BISHOP.

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The following references are of record in the file of this patent:

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Number	Name	Date
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