April 5, 1960 C. PISTOR 2,931,587

SELF-ACTUATING TAILING GUIDE

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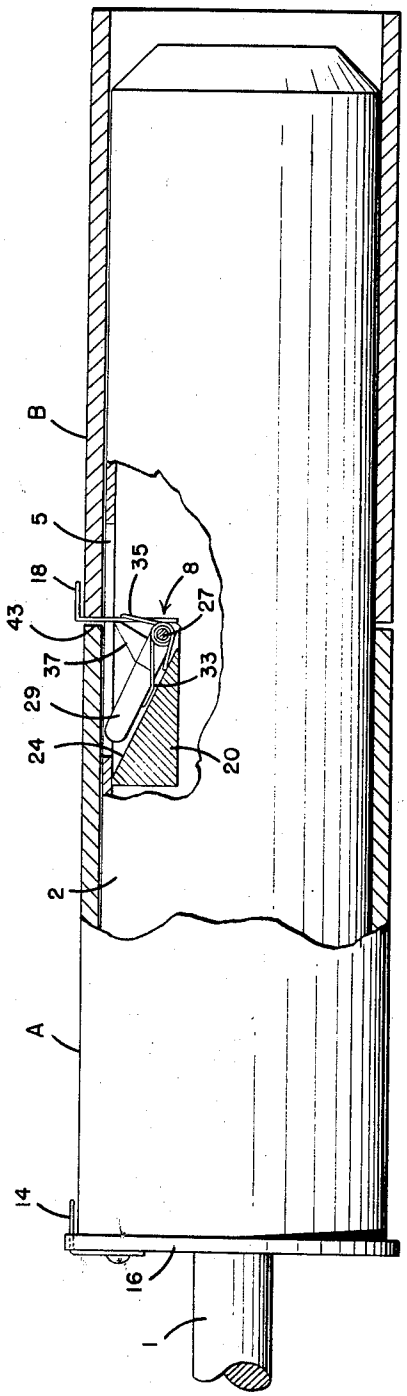


Fig. 1

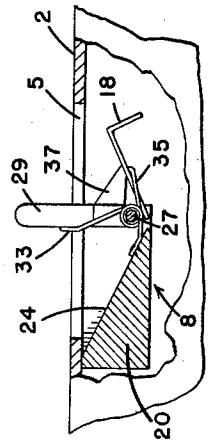


Fig. 4

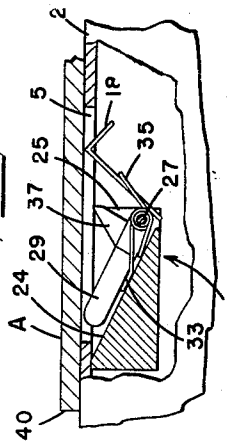


Fig. 5

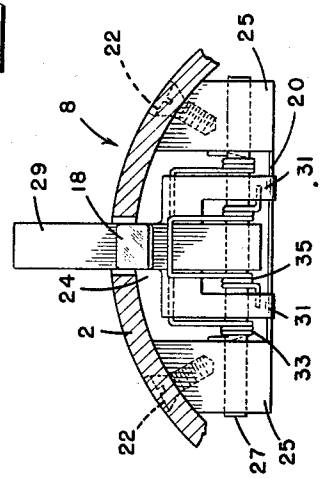


Fig. 3

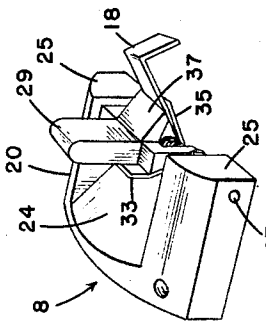


Fig. 2

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SELF-ACTUATING TAILING GUIDE

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6 Claims. (Cl. 242—18)

The present invention relates to a dual yarn winding apparatus wherein a pair of yarn collecting tubes are mounted in an end-to-end or outboard and inboard relationship on a single supporting element secured to a drive shaft or spindle. In particular, the invention relates to a self-actuating tailing or lacing guide assembly for the outboard tube.

In recent years, a method has been developed for producing and processing artificial yarns such as viscose type rayon in continuous manner wherein a pair of finally procesed yarns are delivered in a side-by-side relationship from each final drying drum. The two yarns are then wound up on separate yarn collecting tubes. It was necessary to develop a yarn winding apparatus which was simple in construction, easy to operate, and capable of being installed adjacent the continuous yarn producing and processing machine for simultaneously and separately collecting on individual collecting tubes each yarn of the pair of yarns as they issued from the final drying drums. One of these developed units is described and claimed in U.S. patent application of I. S. Roberts, Serial No. 553,305, entitled Dual Yarn Winding Apparatus.

This unit consists of a sleeve-type support for a pair of collecting tubes supported in an end-to-end or inboard and outboard relationship. The sleeve-type support is secured in a suitable manner to a rotatable drive shaft or spindle whereby the support and the tubes positioned thereupon can be rotated to wind up a running yarn on each of the tubes. A fixed tailing or lacing guide is provided for use in forming a transfer tail (several yarn turns) around the base end of an empty inboard tube before a traverse motion is imparted to the yarn being wound onto the tube. A second manually operated spring loaded tailing or lacing guide is affixed in a suitable manner to the middle section of the sleeve support for use with the outboard yarn collecting tube. When sliding the inboard tube on or off the tube support, the operator depresses the tailing guide so that the inboard tube could ride over the tailing-guide.

This apparatus did not work in a totally satisfactory manner in that much time and both hands of the operator were required in operating the manually depressible tailing guide when sliding the tubes into and out of position on the tube support. Another disadvantage encountered with the manually depressible tailing-guide for the outboard tube is that the operator sometimes failed to fully depress the tailing guide whereby it would catch against the end of the tube as it was being moved into or out of position. This damaged the tube and sometimes bent the tailing guide so that it was rendered inoperative.

It is therefore one object of my invention to provide in such a dual type winding system a self-actuating tailing-guide assembly for the outboard tube which assembly is actuated solely by means of the inboard tube as it is moved into and out of operative position on the sleeve support for the tube.

Another object of my invention is to provide a novel and improved winding or yarn collecting apparatus for collecting two separate yarns simultaneously on separate collecting tubes mounted in an end-to-end or inboard and outboard relationship on a single tube support wherein a self-actuating tailing-guide assembly is provided for the outboard tube.

Other objects and advantages of the invention will become apparent from a study of the following description and drawing wherein

Figure 1 is a view, partially sectioned and partially broken away, of my self-actuating tailing-guide in operative position in a dual yarn tube collecting assembly;

Figure 2 is a perspective of my self-actuating tailing-guide assembly;

Figure 3 is an end view, partially sectioned, of my self-actuating tailing-guide assembly showing the guide assembly secured to the sleeve supporting member for the yarn collecting tubes;

Figure 4 is a side view, partially sectioned, of my self-actuating tailing-guide assembly showing the position of the assembly elements in their normal position when the assembly is secured in place to the sleeve tube support; and

Figure 5 is a side view, partially sectioned, showing the position of my self-actuating tailing-guide assembly as the inboard tube is passing over the guide assembly to be moved into its operating position.

Referring now to the drawing and especially Figure 1, there is seen a winding or yarn collecting apparatus which includes a drive shaft or spindle 1 with a sleeve support 2 secured to the drive shaft for supporting a pair of yarn collecting tubes A and B in end-to-end or inboard (A) and outboard (B) relationship. An elongated slot 5 is cut through the sleeve support 2 adjacent the middle of the support 2 and a self-actuating tailing-guide assembly 8 is secured to the inner surface of the sleeve support wall at a point adjacent one end of the slot 5. As shown in Figure 1, both the inboard yarn collecting tube A and the outboard collecting tube B are in operating position on the sleeve support 2. A permanent or fixed tailing-guide 14 is secured to a base stop 16 for the inboard tube A which stop affixed to the drive shaft 1. The tailing-guide 18 of the self-actuating tailing-guide assembly 8 is shown in Figure 1 in its operative position for forming a tail or series of yarn convolutions around the end of the outboard tube B.

The specific structures of the sleeve supoprt 2 for the yarn collecting tubes A and B and of the connecting means for securing the sleeve support 2 to the drive shaft are not shown nor described herewith since these structures, in their specfic detail, do not constitute a part of my present invention. Details for these structures (preferred) are shown and described in United States patent application of Ingham S. Roberts Serial No. 553,305 mentioned above.

The self-actuating tailing-guide assembly 8 for the outboard tube B will now be described in detail. As seen in Figures 2 and 3 of the drawing, my self-actuating tailing-guide assembly comprises a base support 20 which is secured to the inner surface of the sleeve tube support 2 by retaining screws 22, 22 (Figure 3). As mentioned above, the base piece 20 is secured to the tube support 2 at a point adjacent the inboard end of the slot 5 in the sleeve support 2. The top surface of the base support 20 is rounded whereby it matches the contour of the inside surface of the wall of the sleeve support 2.

As seen more clearly in Figure 2, the central portion of the top surface of the base support 20 tapers downwardly from the far or inboard end of the support to intercept the bottom surface of the support at a point along

the length thereof but prior to the opposite or inboard end of the support. This tapered surface 24 serves a purpose which will be more fully explained hereafter. Since the tapered surface 24 intercepts the bottom surface of the support 20 at a point prior to the opposite end of the support, a pair of projections or legs 25, 25 are provided at the opposite end of the support.

A pin 27 is supported by the legs 25, 25 and extends through the space defined by or between the legs 25, 25. The tailing-guide 18 is pivotally mounted on the pin 27 at a point adjacent the center of the pin.

Also mounted on the pin 27 is an arm guide 29 which, as seen in the drawing, terminates at its base in a pair of spaced-apart legs 31, 31 by which the arm guide 29 is supported on the pin 27. In mounting the arm guide 29 in position on the pin, the legs 31, 31 of the arm guide straddle the mounting point of the tailing-guide 18 on the pin 27.

Both the arm guide 29 and the tailing-guide 18 are supported by tensioned springs 33 and 35 respectively whereby the guides are urged toward one another. As seen in the drawing, the tensioned spring 33 for the arm guide 29 is supported on the pin 27 by coiling the spring ends around the pin adjacent and to the outside of each leg 31, 31 of the arm guide 29. As shown more clearly in Figure 1, the free ends of the spring 33 are supported and tensioned against the tapered surface 24 of the base support 20. The body portion of the spring 33 is arched upwardly and extends across the guide arm 29 in contact therewith. The spring 33 is so tensioned that it urges the arm guide 29 toward the tailing-guide 18.

The tension spring 35 for the tailing-guide 18 has its ends coiled around the pin 27 (Figure 3) adjacent the sides of the tailing-guide 18 and to the inside of each leg 31, 31 of the arm guide 29. The free ends of the spring 35 are anchored to the legs 31, 31 of the arm guide 29. As seen in the drawing, the spring 35 is arched in similar manner to that of spring 33 with the arched portion of the spring extending across and in contact with the tailing-guide 18. The spring 35 is so tensioned that it urges the tailing-guide 18 toward the arm guide 29.

A finger 37 is affixed to and extends outwardly from the arm 29 and is adapted to contact the tailing-guide 18 to maintain the two guides in spaced-apart position when the guides are in their normal position. The degree of tension in the springs 33 and 35 is so adjusted that the arm guide 29 is normally in an upright position as seen in Figure 4 and extends into the path assumed by the inboard collecting tube A as it moves over the sleeve tube support 2 into its operating position. The normal position of the tailing-guide 18 is also shown in Figure 4 wherein it lies below the path assumed by the inboard tube A being retained in this position by the finger 37 of the arm guide 29.

Figure 5 shows the intermediate position assumed by the arm guide 29 and the tailing-guide 18 as the inboard yarn collecting tube A is being moved into its operating position against the base stop 16 (Figure 1). The intermediate position of the guides 29 and 18 as shown in Figure 5 is assumed after the end 40 of the inboard tube A has contacted and retracted or urged the guide arm 29 out of the path assumed by the inboard tube A as it is being moved into position. As seen in Figure 5, the guide arm 29 is moved downwardly adjacent the tapered surface 24 of the base support 20. As the finger 37 of the arm 29 is moved away from the tailing-guide 18, the tailing-guide spring 35 urges the tailing-guide 18 upwardly against the inner wall of the inboard tube A. The guides 29 and 18 remain in this intermediate position until the opposite end 43 of the inboard tube A (Figure 1) passes over the tailing-guide 18 at which point the tailing-guide spring 35 will further urge the tailing-guide 18 into an upright position to assume that position vacated by the guide arm 29 as shown in Figure 1. The tailing-guide 18 is now in position to be used with the outboard yarn collecting tube B after it is moved into position on the sleeve tube support 2. The operative position of the tailing-guide 18 with the outboard tube B in operating position is shown in Figure 1. When the inboard tube A is moved out of operative position, the end 43 of the tube will depress the tailing-guide 18 and when the tube end 40 has passed over the guide arm 29, the guide arm spring 33 will urge the guide arm 29 back into its normal upright position as shown in Figure 4.

As seen from the above description, the operation of the self-actuating tailing-guide is entirely automatic, being actuated solely by movement of the collecting tubes themselves as they are moved into and out of operating position on their support 2.

As mentioned heretofore, the tailing or lacing guides 14 and 18 are used in lacing a yarn onto each collecting tube A and B whereby the transfer tails may be formed at one end of each tube. This tail-forming procedure is well known to the trade; however, for purposes of clarification, the following summary of the procedure is set forth.

The end of the yarn to be collected on the tube B is slipped under the tailing guide 18 and to an aspirator unit (not shown) which continues to draw the yarn from its supply and under the guide 18. The drive shaft or spindle 1 is then rotated whereby the tube support 2, the tailing guide 18, and the tubes A and B are rotated. As the tube B rotates, the yarn positioned under the tailing or lacing guide 18 is snubbed by and on the guide. After the tube B is rotated for approximately a full revolution so that approximately one convolution of yarn is wound around the end of tube B, the yarn is cut at a point adjacent the aspirator to form the transfer end or tail for the eventual yarn package to be formed on the tube B. After the yarn is cut, the winding point of the yarn on the tube is moved to the right (as viewed in Figure 1) being urged thereover by the traverse guide (not shown) through which the running yarn is threaded and which is resting in a stationary position slightly to the right of the tailing guide. Several more turns of yarn are permitted to be wound onto the tube B after which the traverse guide is put in motion to move the yarn back and forth along the tube B as it is being collected on the tube. The same procedure is followed for forming a transfer tail on the inboard tube A using its tailing guide 14.

While preferred embodiments of the invention have been shown and described, it is to be understood that changes and variations may be made without departing from the spirit and scope of the invention as defined in the appended claims.

I claim:

1. A dual tube winding apparatus comprising a rotatable drive shaft, a support secured to the drive shaft for supporting a pair of yarn collecting tubes in end-to-end or inboard and outboard relationship, and a self-actuating tailing-guide assembly for the outboard tube which guide is secured to the tube support.

2. A dual tube winding apparatus comprising a rotatable drive shaft, a support secured to the drive shaft for supporting a pair of yarn collecting tubes in end-to-end or inboard and outboard relationship, a positioning stop member affxed to the drive shaft for determining the position of the inboard tube on the tube support, a fixed tailing-guide secured to the stop member for operation with the inboard tube, and a self-actuating tailing-guide assembly for the outboard tube which guide assembly is secured to the tube support.

3. A self-actuating tailing-guide assembly for the outboard yarn collecting tube in a yarn winding apparatus wherein two yarn collecting tubes are mounted in end-to-end or inboard and outboard relationship on a single supporting element secured to a drive shaft, said assembly comprising a base support adapted to be secured to the tube supporting element at a point adjacent the meeting point of the inboard and outboard tubes when in position

over the tube supporting element, a spring-tensioned tailing-guide for the outboard collection tube pivotally mounted on the base support, and a spring-tensioned guide arm also pivotally mounted on the base support in opposed relationship to the tailing-guide, said tensions within the springs being such that the arm guide and the tailing-guide are urged toward each other with the arm guide normally extending into the path assumed by the inboard collecting tube as it is moved over the tube supporting element into operating position and with the tailing-guide normally lying below said path, said guide arm being urged 'out of and retained out of its normal position away from the tailing-guide when contacted by one end of and the inner surface of the inboard tube wall as the tube is being moved into position over the supporting element, said tailing-guide being retained in its normal position by the inner wall surface of the inboard tube being moved into position until the tube passes beyond the tailing-guide whereby the tailing-guide will be urged by its spring tension into the position vacated by the arm and ready for use with the outboard collection tube, said tailing-guide being urged out of its operative position by the opposite end of and the inner wall surface of the inboard tube when the tube is being removed from the tube supporting element.

4. A yarn collecting or winding apparatus comprising a rotatable drive shaft, a support secured to the drive shaft for supporting a pair of yarn collecting units such as tubes in an end-to-end or inboard and outboard relationship, a base stop for the inboard tube which stop is affixed to the drive shaft, a fixed tailing-guide for the inboard tube affixed to the base stop, a self-actuating tailing-guide assembly for the outboard tube which guide assembly comprises a base support secured to the collection tube supporting element at a point adjacent the meeting point of the inboard and outboard tubes on the tube supporting element, a spring-tensioned tailing-guide for the outboard tube pivotally mounted on the base support, and a spring-tensioned guide arm also pivotally mounted on the base support in opposed relationship to the tailing-

guide, said tensions within the springs being such that the arm guide and the tailing-guide are urged toward each other with the arm guide normally extending into the path assumed by the inboard tube as it is moved over the tube supporting element into its operating position and with the tailing-guide normally lying below said path, said arm guide being urged out of and retained out of its normal position away from the tailing-guide when contacted by one end of and the inner surface of the inboard tube wall as the inboard tube is moved into position over the tube supporting element, said tailing-guide being retained in its normal position by the inner wall surface of the inboard tube being moved into position until the tube passes beyond the tailing-guide whereby the tailing-guide will be urged by its spring tension into the position vacated by the guide arm and ready for use with the outboard collection tube, said tailing-guide being urged out of its operative position by the opposite end of and the inner surface of the inboard tube wall when the tube is being removed from the tube supporting element.

5. A yarn collecting or winding apparatus according to claim 4 comprising a finger affixed to and extending from the arm guide which finger is adapted to contact the tailing-guide to maintain the two guides in spaced-apart relationship when in their normal position.

6. A yarn collecting or winding apparatus according to claim 4 comprising a sleeve secured to the drive shaft for supporting the yarn collection tubes, an elongated slot through the sleeve surface at approximately the middle point of the sleeve, said base support for the tailing-guide assembly being mounted on the inner surface of the sleeve wall adjacent the inboard tube end of the slot whereby the guide arm and tailing-guide supported by the base piece can extend through the slot in the sleeve support and into the path assumed by the inboard collection tube as it moves over the sleeve support into and out of its operative position.

No references cited.