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C. L. HAUSEL

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YARN TAIL GUIDE ASSEMBLY

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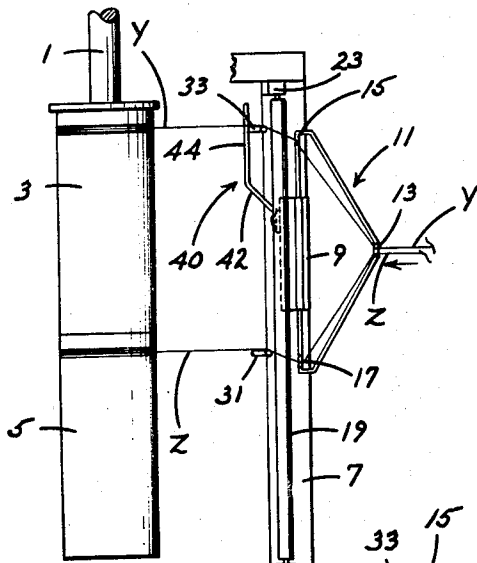


Fig. 1

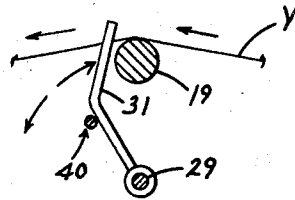


Fig. 5

Fig. 2

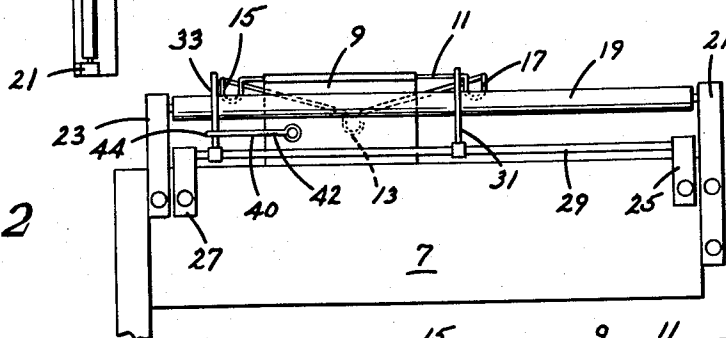


Fig. 3

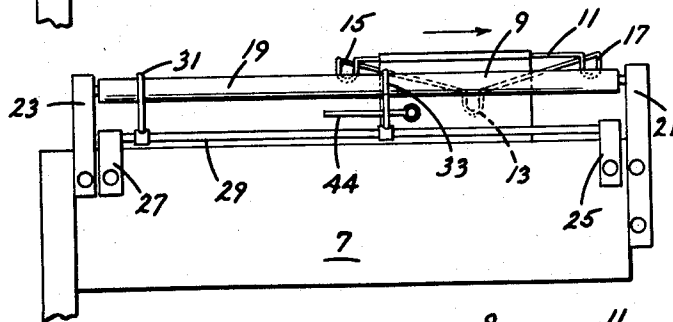
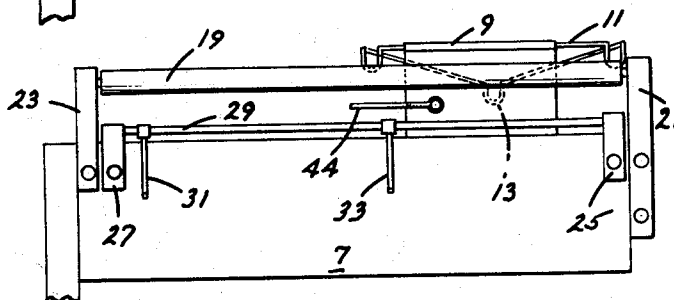


Fig. 4



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## YARN TAIL GUIDE ASSEMBLY

Charles L. Hausel, Wilmington, Del., assignor to American Viscose Corporation, Philadelphia, Pa., a corporation of Delaware

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6 Claims. (Cl. 242—18)

The present invention relates to a dual yarn-tailing guide assembly which is used with a dual yarn-collecting assembly such as is described in U.S. application of I. S. Roberts, Serial No. 553,305 filed December 15, 1955 entitled, Dual Yarn Winding Apparatus. However, the invention may just as well be used with other type dual yarn collection units.

With the dual type yarn collection units, a yarn tail must be formed at one end of each tube before the main body of yarn is wound upon the tube so that in later textile operations such as beaming, etc. wherein continuous yarns are required, the tail yarn of one tube may be tied to the lead end of the yarn on another yarn-filled tube so that there will be no interruption in the operation when the supply of one tube becomes exhausted. For forming the yarn tails on the collection tubes, it is necessary to provide tailing guides which direct the traveling yarn to one end of the collection tube before the traverse movement of the traverse guide is initiated whereby a small number of closely associated yarn turns may be formed at one end of the collection tube. These closely associated turns are identified as the yarn tail.

The above identified application discloses an apparatus which includes a drive spindle having a pair of yarn-collecting tubes supported in endwise relationship upon the spindle which tubes are rotatable with the spindle. A dual traverse guide for traversing and feeding a pair of yarns back and forth along the collecting surface of the tubes (one yarn to each tube) is also provided.

Some difficulty has been encountered in simultaneously forming a tail yarn section on the endwise supported collection tubes with the dual tailing guide unit disclosed by the above-identified application. Generally, the main yarn body covered the tail portion of the yarn rendering it difficult to pull out the tail. Frequently, the tail yarn was broken in attempting to extract the tail.

It is, therefore, one object of my invention to provide a novel and improved dual tailing guide assembly for simultaneously forming tail sections upon each of a pair of endwise positioned yarn-collecting tubes or cones wherein the tail section is formed outside the main yarn body and the yarn turns of the tail are locked in position by successive layers of yarn.

Another object of my invention is to provide a novel and improved dual yarn-tailing guide assembly wherein the tailing guides are held in tail-forming position during the tail-forming operation and are also automatically displaced from their tail-forming position upon initiation of the traversing action through tailing guide control means secured to the traversing element which supports a dual yarn traverse guide.

A still further object of my invention is to provide a novel and improved dual yarn-tailing guide assembly wherein a pair of tailing guide rods are secured to a

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rotatable shaft supported immediately adjacent the traverse track of the traverse frame which frame supports and guides the dual yarn traverse guide during its traversing action.

Other objects and advantages of my invention will become more apparent after studying the following description and drawings wherein:

Figure 1 is a schematic top view of my dual tailing guide assembly shown with a pair of yarn-collection tubes mounted in endwise relationship upon a drive spindle;

Figure 2 is an elevation of the assembly shown in Figure 1 showing the relative position of the elements making up the assembly when the dual tailing guide unit is in its tail-forming position;

Figure 3 is an elevation similar to that of Figure 2 showing the relative position of the elements which make up the tailing guide assembly during the automatic displacement of the dual tailing guide unit from its tail-forming position;

Figure 4 is an elevation similar to Figures 2 and 3 showing the relative position of the elements which form the dual tail guide assembly when the dual tailing guide unit is in its inoperative or non-tail-forming position; and,

Figure 5 is a detail of one of the tailing guide elements shown in its tail-forming position.

Briefly, my novel dual tailing guide assembly comprises a combination of elements wherein the dual tailing guide unit is held in its tail-forming position and is automatically displaced from this position by means secured to a traversing support which supports a dual yarn traverse guide. The actual tailing guides are supported on a rotatable shaft mounted on the traverse frame which supports the traversing member upon which a dual yarn guide is mounted. With this arrangement, the tailing guide assembly does not interfere with the yarn-collecting operation or with the operator when attending the yarn-collecting unit.

Referring now to the drawings, a drive spindle 1 supports a pair of yarn-collection tubes 3 and 5, hereinafter referred to as the inboard tube 3 and the outboard tube 5 respectively. Positioned adjacent the spindle and yarn-collection tubes is an elongated traverse frame 7 which has a slightly greater length than the combined length of the yarn-collection tubes 3 and 5. Slidably supported on the traverse frame 7 is a support plate 9 which supports in fixed position a dual yarn guide 11. The plate 9 and guide 11 are adapted to travel back and forth along the track 7 whereby the yarns may be wound up in even layers upon the tubes 3 and 5. The guide 11 receives a pair of traveling yarns y and z through the guide slot 13 from which point they are separated with the yarn y traveling through the guide slot 15 and the yarn z traveling through the guide slot 17. The traverse stroke is of such a length that the yarn y is traversed back and forth across the yarn-collecting surface of the inboard tube 3 while the yarn z is traversed back and forth across the yarn-collecting surface of the outboard collecting tube 5.

The traverse frame 7 is pivotally supported so that during the actual yarn collection the frame is moved toward the tubes 3 and 5. When in this position, a yarn guide roller 19 supported in bearing supports 21, 23 affixed to the ends of the traverse frame lies against the tube surfaces to insure even build-up of the yarn on the tubes. During the tail-building operation, however, the traverse frame is spaced apart from the spindle and tubes 3, 5 as shown in Figure 1.

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Bearing supports 25, 27 (see Figures 2-4) are also secured at each end of the transverse frame 7 and support a rotatable shaft 29 which lies below the dual guide 11 immediately adjacent the top of frame 7. Secured to the shaft 29 is a pair of tailing guides 31, 33 preferably in the form of small rods (see Figure 5). The guides 31, 33 are so located upon the shaft 29 and in alignment with the ends of the collecting tubes that the tail yarn will be laid upon the tubes away from the area wherein the main yarn package is collected.

As mentioned hereinabove, tailing guides are held in their tail-forming position and displaced from this position by means secured to the transverse guide support plate 9. This means preferably assumes the form of a bent control finger 40 having a bent shank portion 42 which lies between a straight and a right angle with respect to the axis of the transverse frame 7 and an end portion 44 which lies parallel to the axis of the transverse frame. As seen in the drawing, the finger 40 extends outwardly toward the spindle 1 and the tubes 3, 5.

In operation and after the traverse mechanism has been disengaged from its drive, the rotatable bar 29 is rotated in a clockwise direction (Figure 1) until the guides 31, 33 are in a substantially vertical position. The traverse guide plate 9 is then moved along the transverse frame 7 to that end of the frame lying opposite the butt end of the inboard tube 3. As seen in Figure 2, the parallel end 44 of the bent finger 40 slides in back of the tailing guide rod 33 to hold the guiding rods 31 and 33 in their substantially vertical or tail-forming position. After the yarns y and z have been threaded over the tailing guide rods 31, 33 and the yarn tails have been formed upon the ends of the collection tubes 3 and 5 by rotating the spindle 1 for a few turns, a traversing motion is then imparted to the traverse plate 9 through engagement with suitable traverse drive means (not shown) before the traverse frame is pivoted toward the tubes 3 and 5 as mentioned above. One suitable form of traverse drive and the means for disengaging the traverse mechanism from the drive is shown in the above referred to application Serial No. 553,305, but insofar as the present invention is concerned any suitable form of disengageable drive will suffice. As seen in Figures 1 and 3, the shank portion 42 of the bent finger 40 will strike the tailing guide rod 31 and because of the particular slant of the shank portion of the finger, the rod 31 will be urged outwardly over the parallel leg 44 of the finger 40 out of the path of travel of the control finger. Through gravity, the tailing guide supporting shaft 29 will continue to rotate in a counterclockwise direction until the tailing guide rods 31, 33 assume the downwardly extending position shown in Figure 4 of the drawing. From this point on, the tailing guides 31, 33 will remain in their downwardly extending position and will not interfere with the traversing action of the dual guide 11.

By dimensional changes in the location of the bearing supports for the bar 29 or by changes in location of the tailing guide bars on the bar 29, the tail yarn can be located as far away from or as close to the main yarn body as desired.

With the arrangement described above, there is provided a simple but essential tailing guide assembly for use with dual yarn-collection apparatus wherein the yarn-collection units are supported in endwise relationship upon a drive spindle.

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 yarn tail guide assembly for use with a dual yarn-collecting assembly including a drive spindle and a pair of yarn-collecting tubes supported in endwise relationship on the spindle which tubes are rotatable with the spindle, said tail guide assembly comprising an elongated traverse frame mounted in spaced-apart and paral-

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lel relationship with the spindle and collecting tubes, a traverse plate slidably mounted upon the traverse frame, a dual yarn traverse guide supported on the plate, and a dual automatically displaceable tailing guide unit pivotally mounted on said frame.

2. A yarn tail guide assembly for use with a dual yarn-collecting assembly including a drive spindle and a pair of yarn-collection tubes supported in endwise relationship on the spindle which tubes are rotatable with the spindle, said tail guide assembly comprising an elongated traverse frame mounted in spaced-apart and parallel relationship with the spindle and collecting tubes, a traverse plate slidably mounted upon the traverse frame, a dual yarn traverse guide supported on the plate, a dual automatically displaceable tailing guide unit pivotally mounted on the frame, and control means secured to the traverse plate for holding the dual tailing guide unit in its operative position during the tail-forming operation.

3. A yarn tail guide assembly for use with a dual yarn-collecting assembly including a drive spindle and a pair of yarn-collecting tubes supported in endwise relationship on the spindle which tubes are rotatable with the spindle, said tail guide assembly comprising an elongated traverse frame mounted in spaced-apart and parallel relationship with the spindle and collecting tubes, a traverse plate slidably mounted upon the traverse frame, a dual yarn traverse guide supported on the plate, a dual automatically displaceable tailing guide unit pivotally mounted on the frame, and control means secured to the traverse plate for automatically displacing the dual tail guide unit from its tail-forming position when the traverse action of the traverse plate is initiated.

4. A yarn tail guide assembly for use with a dual yarn-collecting assembly including a drive spindle and a pair of yarn-collecting tubes supported in endwise relationship on the spindle which tubes are rotatable with the spindle, said tail guide assembly comprising an elongated traverse frame mounted in spaced-apart and parallel relationship with the spindle and collecting tubes, a traverse plate slidably mounted upon the traverse frame, a dual yarn traverse guide supported on the plate, a dual automatically displaceable tailing guide unit pivotally mounted on the frame, and control means secured to the traverse plate for both maintaining the dual tailing guide unit in its operative position during the tail-forming operation and for automatically displacing the tail guide unit from its operative position when the traverse action of the traverse plate is initiated.

5. A yarn tail guide assembly for use with a dual yarn-collecting assembly including a drive spindle and a pair of yarn-collecting tubes supported in endwise relationship on the spindle which tubes are rotatable with the spindle, said tail guide assembly comprising an elongated traverse frame mounted in spaced-apart and parallel relationship with the spindle and collecting tubes, a traverse plate slidably mounted upon the traverse frame, a dual yarn traverse guide supported on the plate, a rotatable shaft mounted in supports which are secured to the traverse frame, two tailing guide rods secured to and so positioned on said shaft whereby one tailing guide rod lies in alignment with a tail-forming end of each yarn-collection tube, and control means secured to the traverse plate for both holding the tailing guide rods in their tail-forming position and for automatically displacing the rods from their tail-forming position when the traverse action of the traverse plate is initiated.

6. A yarn tail guiding assembly according to claim 5 wherein the tailing guide rod control means comprises an elongated finger having a bent shank portion which lies between a straight and a right angle with respect to the axis of the rotatable shaft, and an end portion which lies substantially parallel with the axis of said shaft, said end portion of the finger being adapted to slide behind one of the tailing guide rods after the rotatable shaft supporting the tailing guide rods is rotated to bring the rods

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in tail-forming position and as the traverse plate is moved to a position adjacent one end of the traverse frame, said bent shank portion of the finger being adapted to displace the tail guide rods out of tail-forming position when the bent shank portion contacts the other tailing guide rod when traversing of the traverse plate is initiated to urge the rod out of the path of travel of the control finger

thereby rotating the partially rotatable shaft in a reverse direction.

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