Jan. 10, 1967 G. E. GILBOS 3,297,264

TENSION AND WAXING DEVICE FOR WINDING MACHINES

Filed May 26, 1964 2 Sheets-Sheet 1

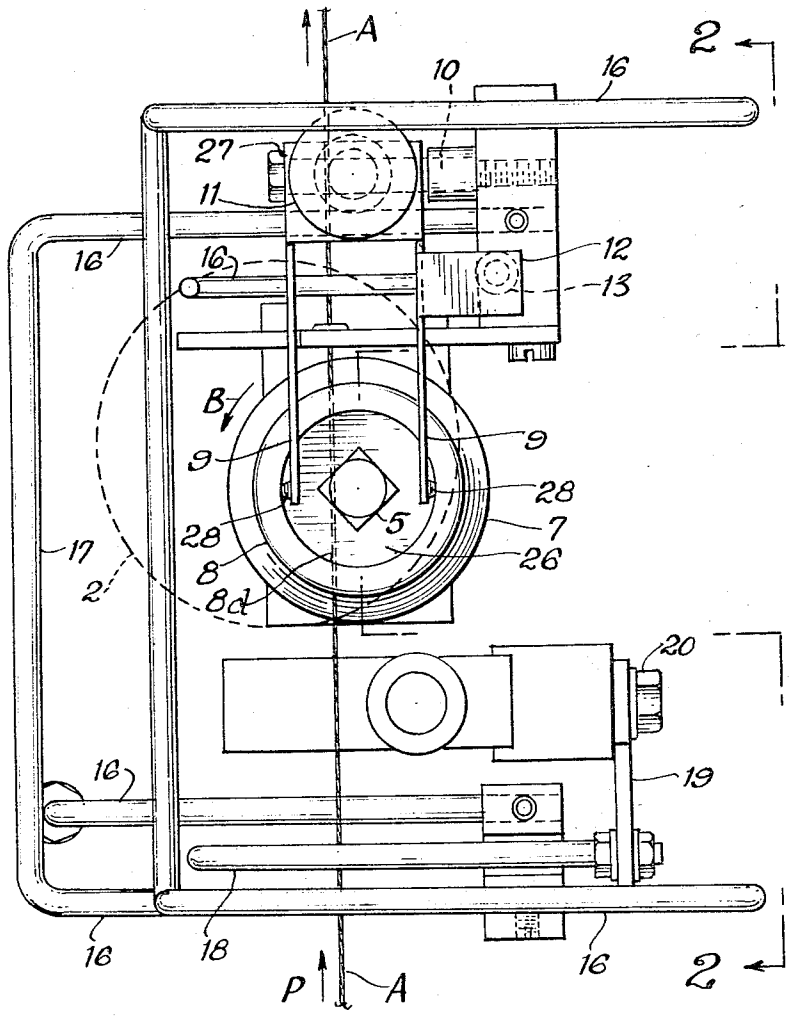


Fig. 1

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Filed May 26, 1964 2 Sheets-Sheet 2

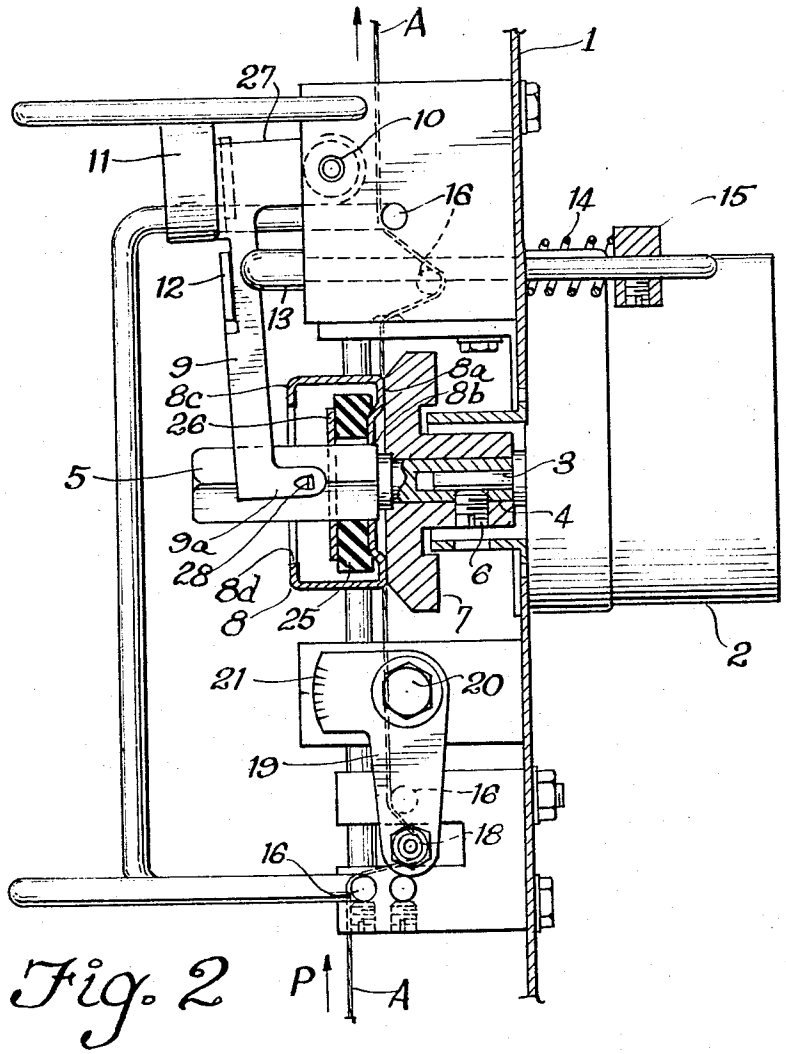


Fig. 2

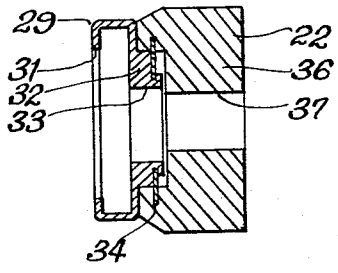


Fig. 3

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United States Patent Office 3,297,264 Patented Jan. 10, 1967

3,297,264

TENSION AND WAXING DEVICE FOR WINDING MACHINES

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Filed May 26, 1964, Ser. No. 370,224
Claims priority, application Belgium, Aug. 29, 1963, 42,929, Patent 636,742
9 Claims. (Cl. 242—35.6)

This invention relates to a combination tension and waxing device for yarn winding machine.

Among the objects of my invention are the provision of means incorporated in a yarn winding machine and located between the supply bobbin and the winding drum guide for tensioning and waxing the yarn being wound and for catching the yarn upon being broken and retaining the same until it is removed and tied.

Certain prior art tension and waxing devices of a well known type have the disadvantage that upon breakage of the yarn, the suction means is likely to suck a double yarn end instead of a single end into the knotting mechanism because the yarn end may be caught in the waxing device. In such case, a defect is introduced into the yarn.

In order to overcome the foregoing disadvantage I provide a tension and waxing device formed of two separate members, one of which may be a waxing disk. Said members are in face to face engagement with each other with the yarn moving between the faces of said members during the winding thereof. As soon as a break in the yarn occurs, one of the members is automatically separated from the other to permit removal of the yarn which is again re-threaded between the members after tying of the yarn by the knotting mechanism is completed.

Another important feature of my invention resides in the fact that both members of the tension and waxing device are mounted on a common shaft and are driven in a direction opposite to that in which the yarn is moving. This permits the yarn to be waxed and the tension of the yarn to be adjusted as a function of the speed of the rotating members.

Other and further objects and advantages of my invention will become apparent from the following description when the same is considered in connection with the accompanying drawings in which,

FIG. 1 is a front elevational view of a tension and waxing device in accordance with my invention;

FIG. 2 is a cross-sectional view taken substantially on line 2—2 of FIG. 1, and

FIG. 3 is a vertical cross-sectional view of a waxing disk.

The tension and waxing device of the present invention is shown in the drawing in conjunction with a winding machine of which only sufficient structure is illustrated for a clear understanding of the invention.

Referring to the drawing, the numeral 1 indicates the frame of a yarn winding unit supporting an electric motor 2 having a shaft 3. An extension shaft 4 having an axial bore is supported on shaft 3 and is provided with a squared end portion 5. A disk 7 provided with a hollow hub portion is carried on shaft 4 and both shaft 4 and disk 7 are fixed to shaft 3 as by a set screw 6. A hollow cylindrical member 8 has an end wall 8*a*, the central area of which is recessed and is provided with a square opening 8*b* arranged to receive the squared shaft end 5. The opposite end wall 8*c* is provided with an enlarged opening 8*d*. The annular marginal area of end wall 8*a* adjacent the periphery of the member 8 is adapted to engage against disk 7. A ring of suitable resilient material 25 is carried on shaft end 5 within member 8 and a washer 26 is disposed contiguous to the ring. The

member 8 rotates with shaft 5 but is capable of axial sliding movement relative to disk 7.

A yoke 27 pivotally supported on a spindle 10 includes a pair of spaced L-shaped arms 9 each having a lateral leg 9*a* provided with a projection 28. The ends of the lateral legs 9*a* pass through opening 8*d* and are adapted to engage against the washer 26 while the projections 28 are adapted to engage against the marginal annular area of wall 8*c*. A counter-weight 11 carried on the yoke 27 normally urges the yoke in a counter-clockwise direction so that the ends of the lateral legs 9*a* are urged against the washer 26. One of the arms 9 is provided with a lateral tab 12 adapted to be engaged by a slideable pin 13. The pin is provided with a collar 15 and a spring 14 circumposed about the pin 13 abuts the collar 15 and the frame 1 and serves to bias the pin 13 in a direction out of engagement with tab 12.

The tension device includes a plurality of yarn guide bars 16 arranged on opposite sides of the member 8 and a system of rods 17 which serve to retain the yarn in the event of breakage. A guide bar 18 is supported on one leg of an L-shaped arm 19 which is pivotally mounted on spindle 20, the other leg of said arm carries a series of graduated markings 21 for the purpose of adjusting the yarn tension.

Referring to FIG. 3, a waxing member indicated by the numeral 22 includes a hollow flat cylindrical member 29 having a relatively large opening 31 at one end and having a hub portion 32 with a relatively smaller opening 33 at the other end. The hub portion 32 is provided with a peripheral groove in which is received a disk 34 which serves to anchor a generally cylindrical mass of wax 36 to the member 29. The wax mass is provided with a square opening 37 to receive the square shaft 5.

It will be understood that member 8 is intended to be replaced by a wax member 22 where waxing of the yarn is desired. In order to effect replacement, it is only required that the legs 9 be flexed together to afford clearance for the projections 28 to pass through the opening 8*d*. Thereafter, the yoke is swung clockwise, as viewed in FIG. 2, so that the member 8 may be slid off the shaft 5 and replaced by member 22, after which the arms 9 are again flexed to insert the projections 28 within the space of member 22.

Before operation of the winding machine the yarn strand A from a supply bobbin, not shown, is threaded over the guide bars 16, adjustable guide bar 18 and is disposed between the member 8 and disk 7, as illustrated in FIGS. 1 and 2 of the drawings. It will be understood that member 8 is moved away from disk 7 to afford entry of the yarn strand between the parts. If the yarn is to be waxed a waxing member 22 may be substituted for member 8 and is mounted in the manner hereinabove described.

While a yarn strand A is moving in the direction indicated by the arrow P, the disk 7 and member 8 or 22 are rotating in the direction, as indicated by arrow B in FIG. 1, this direction being opposed to the direction of movement of the yarn strand. This provides the desired tension for the yarn strand and insures thorough waxing of the yarn strand when the waxing member 22 is used.

In the event of breakage of yarn strand A which may occur in the tension device, the knotting mechanism of the winding machine, not shown, is caused to become operative to act on pin 13 to engage the projection 12 so as to swing yoke 27 in a clockwise direction, as viewed in FIG. 2, to separate member 8 or 22 from disk 7, thereby to release the yarn end. Correspondingly the suction nozzles of the thread finding means associated with the knotting mechanism suck the yarn end of the

package being wound and the released yarn end just mentioned into the knotting mechanism. Upon completion of the knotting operation the yarn strand is threaded in the aforementioned manner and winding of the yarn is resumed.

Various changes coming within the spirit of my invention may suggest themselves to those skilled in the art; hence, I do not wish to be limited to the specific embodiments shown and described or uses mentioned, but intend the same to be merely exemplary, the scope of my invention being limited only by the appended claims.

What I claim is:

1. A tension and waxing device for a yarn winding machine adapted to be located between a supply bobbin and a winding drum guide of said machine and comprising a rotatable shaft, first and second members mounted on said shaft for rotation therewith and adapted to receive a moving yarn strand therebetween, said first member being fixed on said shaft and said second member being movable axially on said shaft relative to said first member, means normally biasing said second member into engagement with said first member but being movable to move said second member out of engagement with said first member, means for rotating said shaft to rotate said members in a direction opposite to the direction of movement of said yarn strand, and means adapted to be actuated by the knotting mechanism of said winding machine upon breakage of said yarn strand for moving said second member away from said first member so as to release said yarn strand whereby said yarn strand may be acted upon by said knotting mechanism.

2. The invention as defined in claim 1 in which said second member includes a waxing disk.

3. The invention as defined in claim 1 including guide bars adapted to be engaged by the yarn strand, one of said bars being rockably supported and adapted for adjusting the tension on said yarn strand.

4. The invention as defined in claim 1 including a system of rods adapted to retain a yarn strand upon breakage.

5. A tension and waxing device for a yarn winding machine adapted to be located between a supply bobbin and a winding drum guide of said machine and comprising a rotatable shaft, first and second members mounted

on said shaft for rotation therewith and adapted to receive a moving yarn strand therebetween, said first member being fixed on said shaft and said second member being movable axially on said shaft relative to said first member, means normally biasing said second member into engagement with said first member but being movable to move said second member out of engagement with said first member, said biasing means including a pivotally mounted yoke member engageable with said second member to move said second member axially on said shaft, means for rotating said shaft to rotate said members, and means adapted to be actuated by the knotting mechanism of said winding machine upon breakage of said yarn strand for moving said second member away from said first member so as to release said yarn strand whereby said yarn strand may be acted upon by said knotting mechanism.

6. The invention as defined in claim 5 in which one of said members includes a waxing disk.

7. The invention as defined in claim 5 in which said yoke member includes an element adapted to be engaged by the means actuated by the knotting mechanism to move said second member away from said first member upon breakage of the yarn strand.

8. The invention as defined in claim 5 in which the second member comprises a hollow cylinder having a resilient disk engaged by the arms of said yoke member.

9. The invention as defined in claim 5 in which the means adapted to be actuated by the knotting mechanism includes a slideable pin normally biased out of engagement with said yoke member.

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