Jan. 19, 1932. O. W. SCHAUM 1,841,680

WINDING MACHINE

Filed May 27, 1929

Fig. 1.

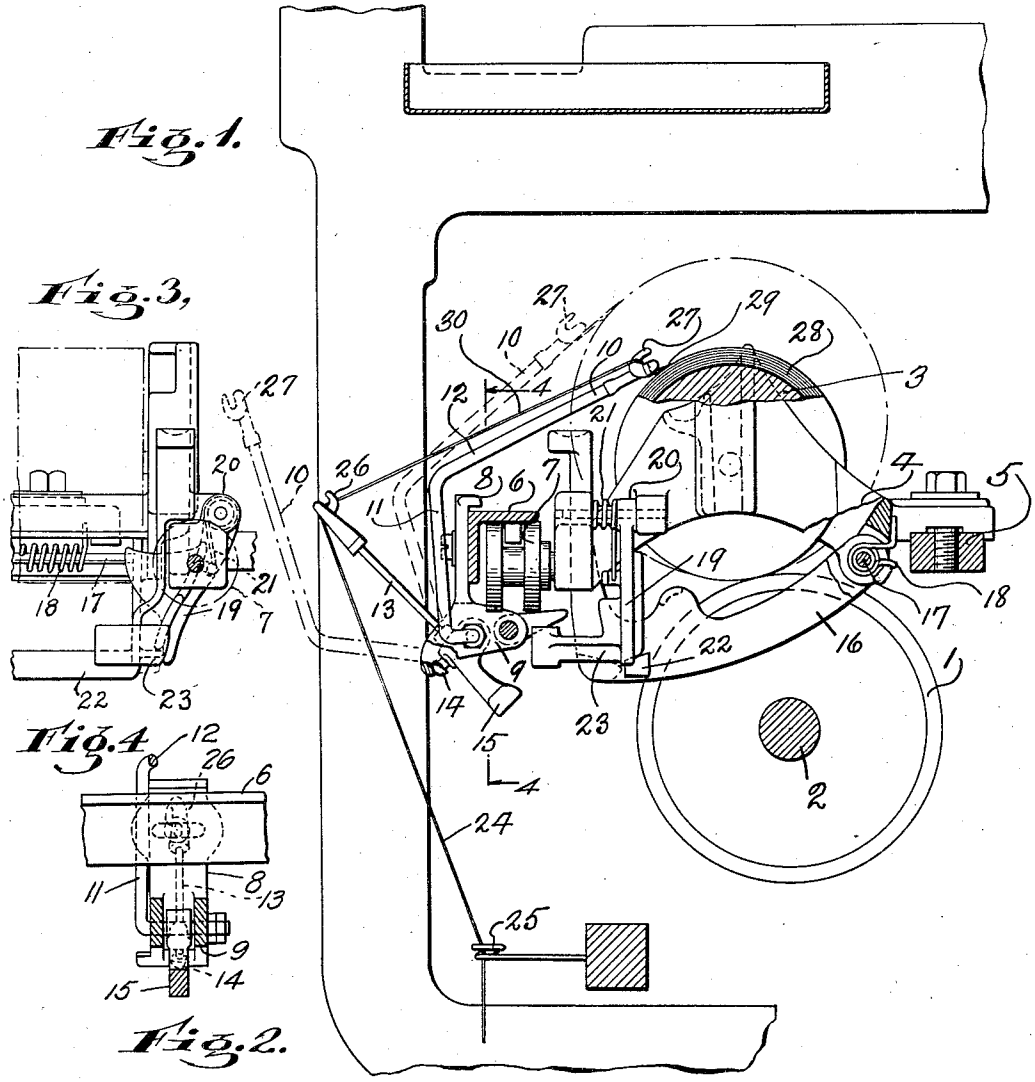
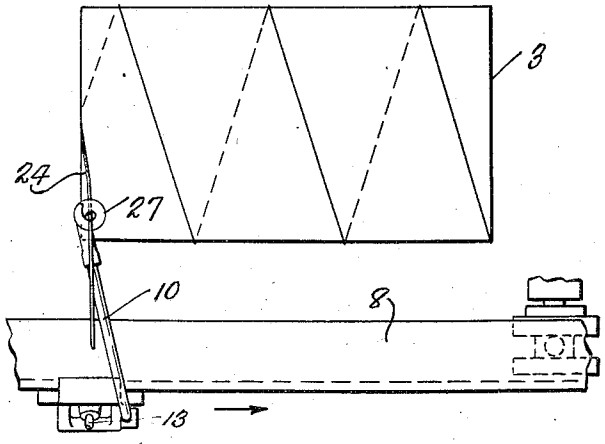


Fig. 3,

Fig. 4

Fig. 2.



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UNITED STATES PATENT OFFICE

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WINDING MACHINE

Application filed May 27, 1929. Serial No. 366,164.

This invention relates to an improvement in winding and/or twisting apparatus with particular reference to the traverse and traverse guide eye for winding a thread upon a tube, cone or headless take up bobbin.

In apparatus as heretofore constructed the guides or guide eyes are fastened to the traverse bar and therefore reciprocate in a straight line which has a fixed position. This position may be several inches away from the tube or other member on which the thread is being wound and such construction does not give an accurate package because the guide must travel beyond the end of the package in order to bring the thread to the package end. Until the guide has returned to a point inside the end of the package approximately the same distance as the over travel the thread is wound at a much smaller angle than desired and tends to pile up on the ends unless means are provided to prevent this condition. Such means have been attempted but usually form a package with tapered ends, comparatively small and loosely wound, while the threads are easily displaced and do not unwind well.

It is one of the objects of my invention to provide a construction whereby the packages will be wound with substantially hard square ends and the thread will unwind therefrom satisfactorily. It will be appreciated also that by providing substantially square-end packages the capacity of a package is increased.

In the machines as heretofore constructed the porcelain guide for the thread rests on the surface of the thread which has been wound, the guide gradually rising as the size of the package increases, but silk or rayon, for which my improved construction is particularly well adapted, would be chafed by such a method and spoiled.

My improved construction provides a mechanism in the form of a pivoted guide wire lying intermediate another guide wire and the package, and having a guide eye at the inner end thereof, i. e., the end adjacent the tube, cone, bobbin or other member on which the thread is being wound, this eye being positioned by that portion of the thread lying between the surface of this member and the eye of the outer guide wire. This pivoted or floating guide wire and eye pivot about an axis which is parallel to the traverse bar at all times so that the guide eye travels the full stroke of the traverse bar longitudinally but is always free to move up with the increase in diameter of the package. I have further provided that the guide wire shall be of such length that the guide eye at the inner end thereof is almost at the point where the thread being wound or twisted first touches the package. The eye never touches the wound threads however and cannot, therefore, chafe or disturb them. The locating of the guide eye at or near the point of contact of the thread being wound with the surface of the threads already wound it will be appreciated reduces the over travel to a minimum so as to maintain the helix angle nearly constant.

On double deck twisters there is very little clearance between the bobbins on the lower deck and the oil pans under the upper deck and for this reason a fixed guide is limited in its location. A further advantage of my construction resides in the fact that the guide being pivoted can be swung outward out of the way when taking out or putting in the member on which the thread is to be wound. This applies not only to ordinary twisters but to twisters of the bobbin lifter type as well.

Furthermore, in my improved construction the guide wire is so shaped that it will fall outwardly by gravity automatically should a thread break or the supply bobbin run empty.

The outer guide wire mentioned is conveniently carried on the intermediate guide wire, that is to say, pivoted thereon which makes for a reduction in manufacturing costs. This outer guide wire is also arranged with a faller foot adapted when the eye of the guide wire is no longer supported to move upwardly and trip latch mechanism which releases the lifter and lifts the member on which the thread is being wound out of its bearings.

It is sometimes desirable to change the helix angle of the wind or twist and such change is effected by changing the gear ratio between the friction roll and the traverse cam.

My construction, under these conditions, will make a package almost exactly the same length as before, as distinguished from the fixed guide type of construction above referred to which would necessitate an adjustment in the stroke of the traverse bar, the over travel appreciably changing with each change in the helix angle. In other words, the further the guide is from the point of contact the more change is needed.

In the drawings accompanying this application:

Fig. 1 shows an embodiment of my invention in part sectional end elevation;

Fig. 2 is a more or less diagrammatic view illustrating the package produced by my improved construction;

Fig. 3 is an elevation of the structure of Fig. 1 looking from left to right; and

Fig. 4 is a view on the line 4—4 of Fig. 1.

Referring to the drawings in detail, 1 designates the friction driving roller, it being understood that in an actual machine there are a number of these rollers, all disposed on the one driven shaft 2.

The bobbin is designated 3. The term "bobbin" as herein employed is, for the sake of clarity to be interpreted as meaning, a tube, cone or a headless bobbin, or other member employed in this art and on which the thread is to be wound. In actual practice there is a bobbin for each roller. The bobbin as will be seen from the drawings is disposed immediately above the friction driving roller and the silk or other material being wound, spun or twisted rests on the periphery of the friction roller thereby providing a drive between each friction driving roller and its corresponding bobbin. The mechanism so far described is standard commercial practice. The bobbin 3 is mounted in a frame 4 secured to a rail 5 extending lengthwise of the machine.

6 designates a traverse rail reciprocated through suitable mechanism, standard equipment in existing machines, over rollers 7.

Carried by the traverse rail 6 is a bracket 8, it being understood that this bracket is rigid with the rail. The bracket is provided with a foot 9 and pivotally carried by this foot is an intermediate guide wire 10 extending upwardly from the foot as shown at 11 and inwardly as shown at 12 toward the bobbin 3. The lower part of the guide wire 10 extends parallel to the traverse bar 6 and provides a pivot for an outer guide wire 13. The pivoting of the outer guide wire 13 in one direction, to wit, toward the bobbin 3 is limited by a stop 14 carried thereby and adapted on a certain predetermined travel to engage the foot 9 on traverse bar bracket 8.

As will be seen from Fig. 1 the outer guide wire 13 carries a faller foot 15.

The frame 4 above referred to is provided with a cradle pivoted thereto, the ends or end members of this cradle designated 16 lying beneath the ends of the bobbin. The pivot for the cradle end members is shown at 17 and is provided with a spring 18 so arranged that the spring will tend to raise the cradle upwardly to lift the bobbin 3 out of its bearings. The cradle is held in its normal position by latch mechanism. This latch mechanism is in the form of an arm 19 pivoted at 20 to the frame 4, the arm being held inwardly as viewed in Fig. 1 toward the cradle member 16 by a spring 21, and under normal conditions the lower end of this arm will engage a lug 22 on the cradle member 16 to prevent the latter from swinging upwardly to lift the bobbin out of its bearings. The arm 19 has a lateral extension, shown at 23, which is adapted to cooperate with the faller foot 15.

The thread being applied to the bobbin 3 is designated 24, this thread passing upwardly from the spool or spools, not shown, through a stationary eye 25, and then being threaded through a porcelain eye 26 carried on the outer end of the outer guide wire 13. The thread after passing through this eye is threaded through a porcelain eye 27 carried at the inner end of the intermediate guide wire 10. It will be seen from Fig. 1 that the arm 10 is so shaped and so dimensioned that the eye 27 carried thereby does not contact with the surface of the material 24 shown at 28 being wound upon the bobbin 3, this eye being located at or near the point of contact 29 of the thread 24 with that portion of the thread already wound upon the bobbin. The arm 10 and eye 27 are held in this position by that portion of the thread 24 designated 30 lying between the eye 26 and the material 28 on the bobbin. Inasmuch as the eye 27 never touches the thread wound upon the bobbin 3 chafing of the thread is avoided.

As above pointed out the intermediate guide wire 10 is so shaped and is so pivoted in the foot 9 of the traverse bar bracket 8 as to automatically fall away from the bobbin 3 and the material wound thereon in the event of breakage of the thread 24. This also prevents any injury to the thread on the bobbin.

The latching mechanism for the cradle member 16 is tripped on breakage of the thread 24 due to the outer guide wire 13 falling outwardly until the faller foot is in line with the outer end of the lateral arm 23 so that when the traverse bar moves sufficiently the faller foot 15 will swing the arm 19 away from the cradle 16 and the lug 22 carried thereby to unlatch the cradle and permit the cradle members 16 to move outwardly under the action of the spring 18 to lift the bobbin out of its bearings.

From the foregoing it will be seen that the intermediate guide wire 10 is a floating guide and pivots about an axis parallel to the traverse bar 6 at all times so that the guide eye 27 travels the full stroke of the traverse bar

longitudinally but is always free to move upwardly with increase in diameter of the package being wound.

It will be seen also that the wire 10 is of such a length and is so positioned that the guide eye 27 as above mentioned is almost at the point 29 where the thread 24 touches the package. By so locating this eye it will be appreciated that the over travel thereof is reduced to a minimum and that the helix angle will be maintained nearly constant.

As above mentioned also on double deck twisters there is very little clearance between the bobbins on the lower deck and the oil pans on the upper deck and consequently a fixed guide is limited in its location. By reason of the fact that my improved construction provides the pivoted guide wire 10 which can be swung outwardly when taking out or putting in a bobbin I have provided apparatus having decided advantages over those now in commercial use in connection with double deck twisters.

What I claim is:—

1. In apparatus of the class described and comprising a bobbin, the combination of a traverse bar, a guide wire pivotally carried thereby and provided with a guide eye for the thread passing to the bobbin, said wire and eye being rocked away from the bobbin as the diameter of the latter increases to maintain the guide eye at all times positioned adjacent but out of contact with the thread wound upon the bobbin.

2. In apparatus of the class described and comprising a bobbin, the combination of a traverse bar, an outer thread guiding wire and an intermediate guide wire for the same thread pivotally supported by said traverse bar, the position of the intermediate guide wire on its pivot being controlled by that portion of the thread being guided which extends intermediate the outer guide wire and the surface of the thread wound upon the bobbin.

3. In apparatus of the class described and comprising a bobbin, the combination of a traverse bar, a pivoted guide wire for guiding thread to said bobbin and an auxiliary guide wire for the thread pivoted on the traverse bar and lying intermediate the first mentioned guide wire and the thread wound upon said bobbin, and resting upon and hence controlled as to its position on its pivot by that portion of the thread being guided lying intermediate the first mentioned guide wire and the thread upon the bobbin.

4. In apparatus of the class described and comprising a bobbin, the combination of a traverse bar, a guide wire for guiding thread to said bobbin, a second guide wire for said thread intermediate the first mentioned wire and the bobbin, each of said guide wires being pivotally mounted and pivoting about an axis extending parallel to the traverse bar, the intermediate guide wire resting upon and hence controlled as to its position on its pivot by that portion of the thread lying intermediate the first mentioned wire and the bobbin.

5. In apparatus of the class described the combination of a traverse bar, an outer guide wire, an intermediate guide wire pivotally supported by the outer guide wire both arms pivoting about an axis extending parallel to the traverse bar.

6. In apparatus of the class described the combination of a traverse bar, an intermediate guide wire pivoted thereon and an outer guide wire pivoted on said intermediate guide wire, both wires pivoting on an axis parallel to the traverse bar.

7. In apparatus of the class described the combination of a traverse bar, a bobbin, guide wires for guiding thread from the source of supply to said bobbin, each of said wires pivoting about an axis parallel to the traverse bar and so disposed as to pivot in a direction away from the bobbin upon the fracture of a thread being guided by said wires.

8. In apparatus of the class described and comprising a traverse bar, a pair of floating guide wires carried thereby, said guide wires pivoting about an axis parallel to the traverse bar and having movement relatively to each other.

9. In apparatus of the class described and comprising a bobbin, a traverse bar, guide wires for guiding thread from a source of supply to said bobbin, said guide wires being pivotally mounted on said traverse bar, said wires having pivotal movement relatively to each other, one of said wires lying intermediate the other of said wires and said bobbin and positioned on its pivot by the thread extending from the outer guide wire to the surface of the bobbin.

This specification signed this 24th day of May, 1929.

OTTO W. SCHAUM.