

July 31, 1934.

J. LAMBECK

1,968,406

SPOOL WINDING APPARATUS

Filed Nov. 28, 1931

2 Sheets-Sheet 1

Fig. 1.

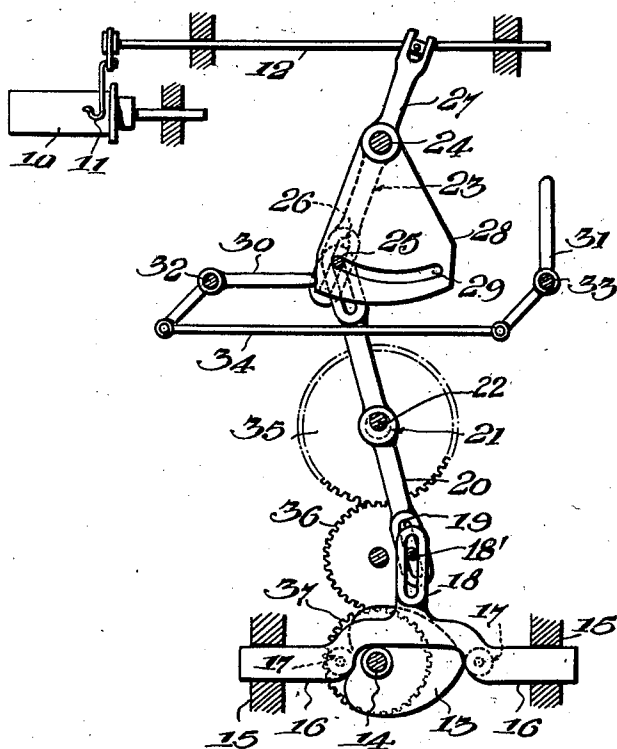


Fig. 2.

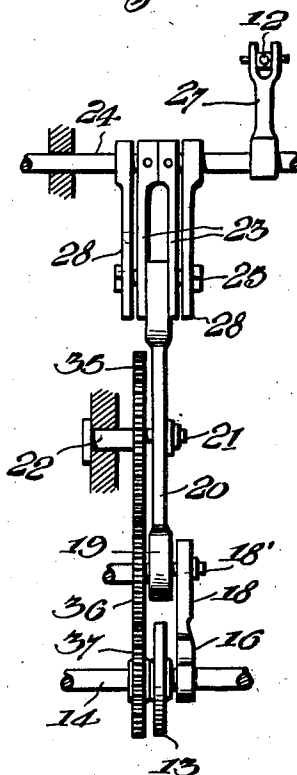
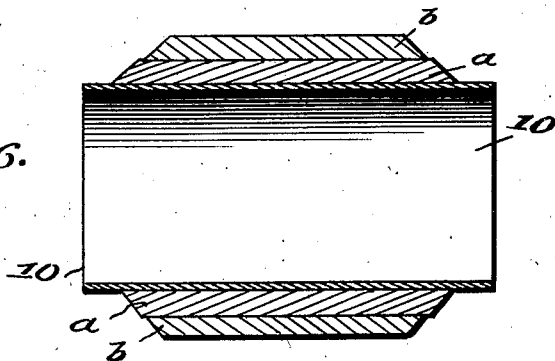


Fig. 6.



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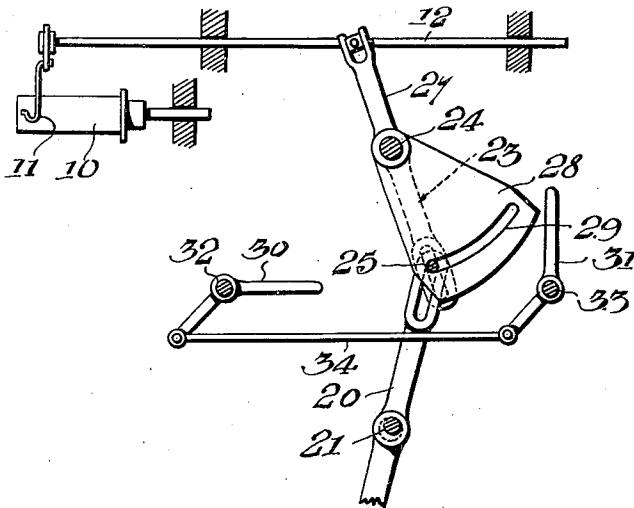


Fig. 3.

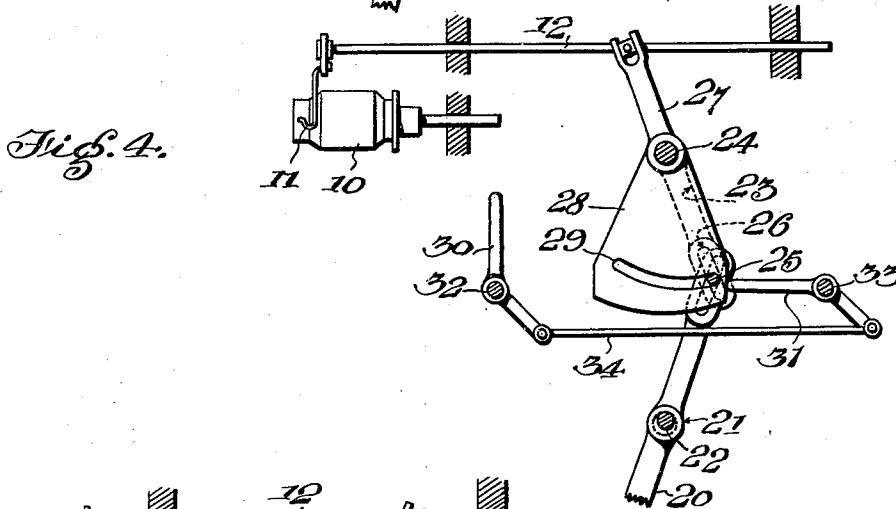


Fig. 4.

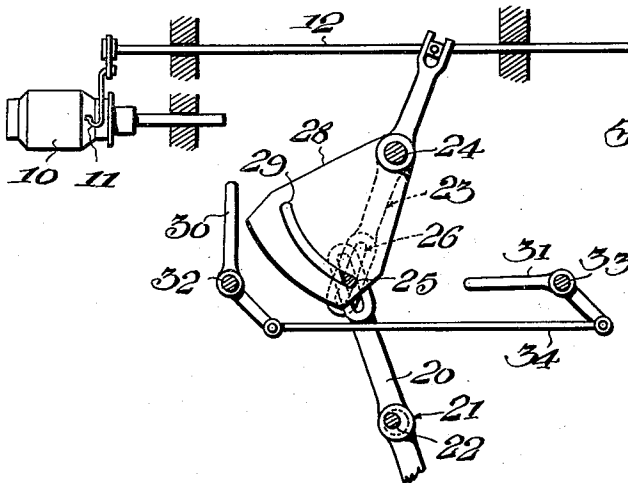


Fig. 5.

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SPOOL WINDING APPARATUS

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Application November 28, 1931, Serial No. 577,847
In Germany December 4, 1930

3 Claims. (Cl. 242-43)

This invention relates to a method of and apparatus for the winding of spools on artificial silk spinning machines.

In the present methods for winding artificial silk thread and the like on spools the thread guiding and shifting means has been such as to produce a cylindrical yarn body with slanting ends. The slanting ends have been obtained by providing mechanism which gradually decreases the length of stroke of the thread shifting means. However, if a certain winding thickness, which itself depends on the degree of slant desired, is exceeded, a vertical edge of thread will be formed. Such formation possesses many disadvantages. The thread layers making up the vertical edge will slip and be folded on the slanting surface during the washing and drying of the threads, forming areas of tightly packed thread. When the treated thread is rewound, the thread at those points will not unwind freely, causing frequent breakage of the threads with the consequent loss of time and labor.

It is, therefore, an object of this invention to provide suitable mechanism which will prevent the building up of a vertical layer of thread on the spool and thus prevent the formation of tightly packed layers of thread.

Another object of this invention is to provide a suitable method of and apparatus for placing several windings on top of one another by changing the thread stroke after each winding.

These and other objects of this invention will become more apparent from a study of the following description, and the drawings in which:

Fig. 1 is a partial side elevational view of a preferred embodiment of the invention, certain parts thereof being shown in cross-section;

Fig. 2 is an end elevation thereof;

Fig. 3 is a view similar to that of Fig. 1, but showing the operative parts in their opposite position;

Fig. 4 is a view similar to that of Fig. 1, but showing the stroke adjusting means in position;

Fig. 5 is a view similar to that of Fig. 4, but showing the operative parts in their opposite position; and

Fig. 6 is a cross-sectional view of the spool showing two types of windings one on top of the other.

Referring now to the drawings, and more particularly to Figs. 1-3 inclusive there is shown a preferred embodiment of the invention. The thread to be wound on the spool (10) is conveyed thereto by a thread guide (11) which is attached

in any suitable manner to a thread guide rod (12). Reciprocatory motion is imparted to the thread guide rod by means of a cam (13) secured to the cam shaft (14). A stirrup-shaped lever (16) carrying rollers (17) is journaled in bearings (15), and is so mounted as to be reciprocated by the cam (13). The central portion of the lever (16) is provided with a slotted arm (18) which is connected to the slotted end (19) of the lever (20) by means of a nut and a bolt (18') passing through the slots.

The lever (20) is pivotally mounted at (21) to an eccentrically mounted stub shaft (22). The other end of the lever is connected to levers (23) which are secured to a shaft (24). To form a slidable connection between the lever (20) and the levers (23), they are connected together by a bolt (25) riding in slots (26) formed in the ends thereof. A lever (27) is connected to the shaft (24) and one end thereof is forked so as to engage with a pin or other suitable connecting means secured to the thread guide rod. In operation, upon oscillatory movement being imparted to the cam the thread guide rod is reciprocated by the levers (20), (23) and (27).

The length of the thread guide stroke is changed automatically through the eccentric on the stub shaft 22. As shown, the mechanism for so doing is indicated by the gear 37 integrally placed on the cam shaft 14, which gear meshes with an intermediate gear 36 for the purpose of driving the gear 35 which rotates the eccentrically mounted stub shaft 22, thereby shortening the swing of the slotted end 26 of lever 20 and so in turn shortening the swing of lever 27 thereby decreasing the stroke of the thread guide 11.

Pivotally mounted on the shaft 24 are a pair of segmental plates 28; these plates are loosely pivoted on said shaft 24 for a purpose to be later more fully disclosed. The plates 28 are provided with curved slots 29 eccentrically arranged with respect to the shaft 24 in which slots the bolt 25 extends. It will be seen by reference to Figures 1 and 3 if unhindered the bolt will remain in the left hand side of the slot because of a tendency to jam and take the path of least resistance, because of the eccentric slots 29 thereby having only the stub shaft 22 operating to change the length of stroke of the oscillating thread guide 11.

These segments 28 can be shifted to shorten the length of the stroke by means of a hand-operated lever system as shown in the drawings. Bell crank levers 30 and 31 are pivotally mounted on bolts 32 and 33 with a connecting rod 34

to ensure said levers 30 and 31 working in unison. In the drawings in Figures 1 and 3 the left hand lever 30 is shown depressed or in operative position and with the bolt 25 at the left hand end of slots 29. In Figures 4 and 5 the bell crank lever 31 is shown depressed or in operative position with the handle end in the path of travel of the slotted segments 28, which on meeting said lever are stopped but the bolt 25 rides in the eccentric slot 29 to the right hand side thereby shortening the pivot point of the intermediate lever 20 and decreasing the stroke of the oscillating thread guide 11.

In operation of the winding of the spools the stroke of the oscillating thread guide is being automatically shortened by means of the eccentrically mounted stub shaft 22 through the medium of gears 37, 36 and 35. Now, when the point is reached where a sufficient winding thickness has occurred and the danger of a vertical edge of thread is imminent, the operator depresses the hand-operated lever mechanism 30, 31 and 34 in such fashion that the segmental plates 28 are caused to remain stationary as before described, the bolt 25 will ride in the slots 29 thereby shortening the thread guide stroke even more and eliminating the danger of vertical edges in the thread winding. In this manner a second slanting wind *b* (Fig. 6) can be wound on the first winding *a* using the same adjustment. It is readily seen from the foregoing description of the operation that when the segmental plates 28 are shifted, a greater decrease in the length of the thread guide stroke is made than the normal gradual increase automatically effected by the eccentric on the stub shaft 22. This results in a stepping in of the second winding *b* as shown in Fig. 6, thus preventing any danger of a vertical wind.

From the above description it will be appreciated that there has been provided a simple and efficient mechanism for producing cylindrical yarn bodies having slanting ends without the production of a vertical edge of yarn which has been found to cause the breakage of the threads during the winding thereof after the same have been washed and dried.

Although the invention has been described with particular reference to the specific embodiment

disclosed, it is to be understood that the invention is not specifically limited thereto but may be varied in many details without departing from the spirit of the invention or the scope of the appended claims:

What is claimed as new:

1. A device for winding successive layers of thread on spinning spools comprising, a thread guide rod, a thread guide secured thereto, a shaft, a lever pivotally mounted thereon, cam actuated means for oscillating said lever, a second lever having a slidable connection with said first mentioned lever and having connection with said thread guide rod, a plate having a curved slot formed therein and associated with said slidable connection, and means to shift said slidable connection along said curved slot whereby the length of the oscillation of said levers and thread guide rod may be changed.

2. A device for winding successive layers of thread on spinning spools comprising, a thread guide rod, a thread guide secured thereto, a shaft, a lever pivotally mounted thereon, cam actuated means for oscillating said lever, a second lever having a slidable connection with said first mentioned lever and having connection with said thread guide rod, a plate having a curved slot formed therein and associated with said slidable connection, and means to shift said slidable connection along said curved slot whereby the length of the oscillation of said levers and thread guide rod may be changed, comprising a pair of spaced levers adapted to engage said plate.

3. A device for winding successive layers of thread on spinning spools comprising, a thread guide rod, a thread guide secured thereto, a shaft, a lever pivotally mounted thereon, cam actuated means for oscillating said lever, a second lever having a slidable connection with said first mentioned lever and having connection with said thread guide rod, a plate having a curved slot formed therein and associated with said slidable connection, and means to shift said slidable connection along said curved slot whereby the length of the oscillation of said levers and thread guide rod may be changed, comprising a pair of spaced levers adapted to alternately engage said plate.

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