Nov. 17, 1931. A. A. GRUNDY 1,832,628

WINDING MECHANISM

Filed Aug. 7, 1929

FIG. 1.

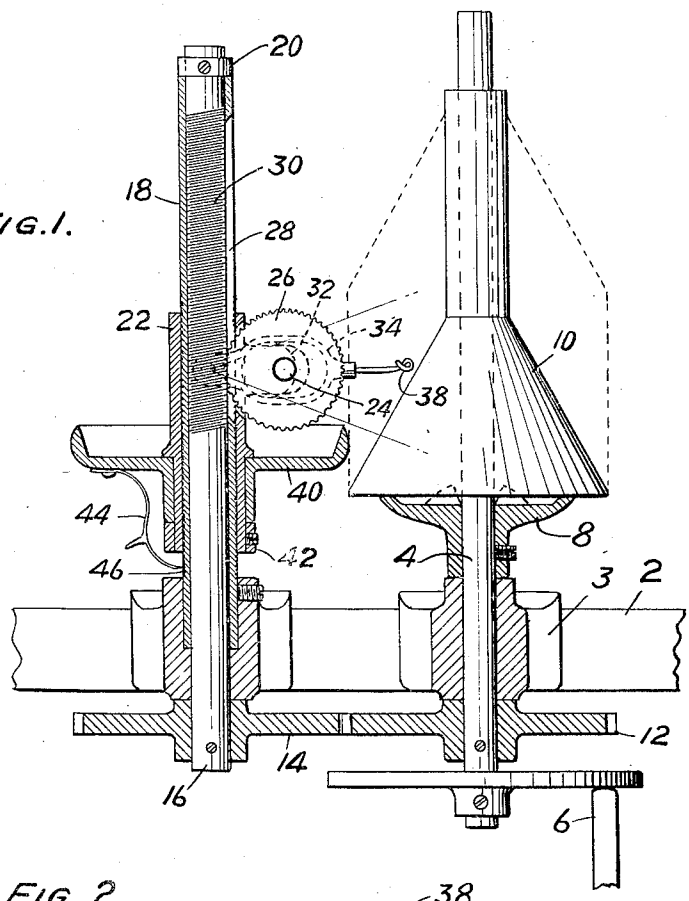
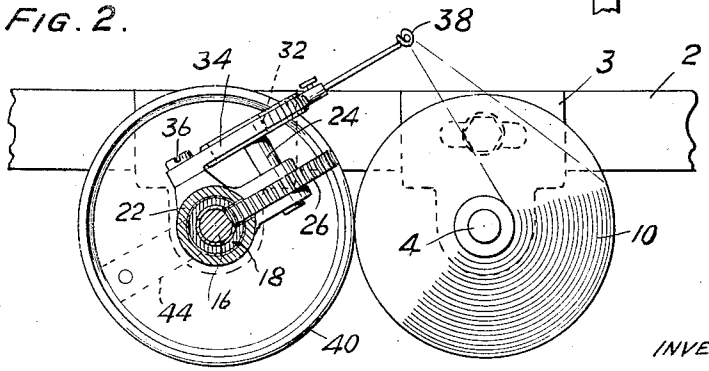


FIG. 2.



WITNESS:

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UNITED STATES PATENT OFFICE

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WINDING MECHANISM

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This invention relates to a winding machine of the type adapted to produce wound bobbins of yarn.

The winding mechanisms designed to wind yarn on large bobbins have heretofore generally produced a relatively loose winding which would readily be dislodged, by accident, from its spool, thereby possibly producing unwinding which would produce difficulties of handling.

It is the broad object of the present invention to provide a mechanism which will produce a tight winding of yarn upon a suitable spool so that the winding will not be readily dislodged from the spool.

Further objects relate to an automatic control whereby the diameter of the wound bobbin is maintained uniform and of a predetermined amount.

More detailed objects relating to an improved mechanism for effecting the above results will be apparent from the following description read in conjunction with the accompanying drawings, in which:

Fig. 1 is a vertical sectional view through the improved mechanism; and

Fig. 2 is a plan view partly in section of the mechanism.

The frame 2 of the machine carries a bracket 3 provided with a slot as indicated in Fig. 2, through which a suitable bolt is arranged to extend so that a transverse adjustment of the bracket is obtainable. Within bracket 3 is journalled a spindle 4 which is driven through suitable friction discs 6 in the well known manner whereby variation of speed is obtainable. Spindle 4 carries a collar 8 which is arranged to provide a mounting for a suitable spool 10 which in the present instance is conical at its lower end, the cone being joined at its upper end with a cylindrical portion surrounding the spindle.

A gear 12 carried by a lower end of spindle 4 meshes with a second gear 14 secured to a spindle 16. A sleeve 18 is secured within a suitable bracket carried by the frame 2 and provides a journal for spindle 16, the spindle being retained within the fixed sleeve by a collar 20 secured to the top of the spindle.

Slidably mounted on a fixed sleeve 18 is a carrier 22 in which is mounted a shaft 24 carrying a worm wheel 26 extending through a longitudinal slot 28 in the sleeve and meshing with a worm 30 formed on the spindle. The opposite end of shaft 24 carries a cam 32 received in an opening in an arm 34 for a thread guiding eye 38, which arm is pivoted to the carrier 22 as indicated at 36.

Journalled on the carrier 22 is a cup 40 having a rounded periphery extending adjacent to the spool 10 as shown in Figs. 1 and 2, this cup being retained on the carrier 22 by means of a collar 42. A spring arm 44 is carried by the cup and is provided with an end engaging threads 46 formed on the outside of sleeve 18.

In the operation of the device, assuming the carrier 22 to be substantially in a position shown in Fig. 1, the guiding eye 38 carrying the yarn to be wound on the spool will be given an oscillatory movement by cam 32, which is rotated through worm 30 and worm wheel 26. The yarn is thus wound upon the lower conical portion 10 of the spool, the guiding eye oscillating within a range of movement substantially as indicated by the dash lines in Fig. 1. As the windings build up upon the conical portion of the spool they contact with the periphery of cup 40, rotating this cup so that the spring follower 44 will ride upwardly within the grooves between the threads 46, thus raising the carrier and changing the range of the oscillatory movement of guiding eye 38. As this occurs, the windings are laid upon the conical surface of the previous windings, again building up the wound bobbin until the new windings contact with the periphery of cup 40, whereupon the range of oscillation is again moved upwardly.

By the method of winding accomplished by the mechanism described not only is there produced a tightly wound bobbin from which the windings will not be readily displaced, but a bobbin of a uniform diameter in its cylindrical portion is produced, as indicated by the dotted lines in Fig. 1.

What I claim and desire to protect by Letters Patent is:

1. A winding mechanism including means for rotatably mounting a spool, a rotary spindle mounted in parallelism with the axis of rotation of the spool, a guiding sleeve about the spindle, a carrier mounted on the guiding sleeve for movement in the direction of the axis of the spindle, a yarn guide oscillatably mounted on the carrier, connections between the spindle and yarn guide for oscillating the latter, and means for moving the carrier along the guiding sleeve.

2. A winding mechanism including means for rotatably mounting a spool, a rotary spindle mounted in parallelism with the axis of rotation of the spool, a guiding sleeve about the spindle, a carrier mounted on the guiding sleeve for movement in the direction of the axis of the spindle, a yarn guide oscillatably mounted on the carrier, connections between the spindle and yarn guide for oscillating the latter, and means for moving the carrier along the guiding sleeve, said last named means being operated automatically when the windings on the spool reach predetermined positions.

3. A winding mechanism including means for rotatably mounting a spool, a rotary spindle including a worm mounted in parallelism with the axis of rotation of the spool, a fixed, outwardly threaded tube surrounding said spindle, a carrier mounted for sliding movement along the tube, a yarn guide pivoted on the carrier, a cam for oscillating the yarn guide, a worm wheel meshing with said worm and connected to the cam to rotate said cam, a rotary member journalled on the carrier coaxially with said tube and arranged to contact with windings on the spool, and an element carried by the rotary member and engaging the threads on the tube whereby rotation of the rotary member by the windings on the spool produces a movement of the carrier along the tube.

4. A winding mechanism including means for rotatably mounting a spool, a rotary spindle mounted in parallelism with the axis of rotation of the spool, a guiding sleeve about the spindle, a carrier mounted on the guiding sleeve for movement in the direction of the axis of the spindle, a yarn guide oscillatably mounted on the carrier, connections between the spindle and yarn guide for oscillating the latter, said means including threads on the spindle engaged by a worm wheel on the carrier, and means for moving the carrier along the guiding sleeve.

5. A winding mechanism including means for rotatably mounting a spool, a rotary spindle mounted in parallelism with the axis of rotation of the spool, a guiding sleeve about the spindle, a carrier mounted on the guiding sleeve for movement in the direction of the axis of the spindle, a yarn guide oscillatably mounted on the carrier, connections between the spindle and yarn guide for oscillating the latter, and means for moving the carrier along the guiding sleeve, said means including threads on the sleeve engaged by a rotary follower on the carrier.

6. A winding mechanism including means for rotatably mounting a spool, a rotary spindle mounted in parallelism with the axis of rotation of the spool, a guiding sleeve about the spindle, a carrier mounted on the guiding sleeve for movement in the direction of the axis of the spindle, a yarn guide oscillatably mounted on the carrier, connections between the spindle and yarn guide for oscillating the latter, said means including threads on the spindle engaged by a worm wheel on the carrier, and means for moving the carrier along the guiding sleeve, said means including threads on the sleeve engaged by a rotary follower on the carrier.

7. A winding mechanism including means for rotatably mounting a spool, a rotary spindle including a worm mounted in parallelism with the axis of rotation of the spool, a carrier movable in the direction of said axis, a yarn guide oscillatably mounted on the carrier, connections between the spindle and yarn guide for oscillating the latter including a worm wheel engaging the worm, and means for moving the carrier in the direction of said axis.

In testimony of which invention, I have hereunto set my hand, at Philadelphia, Penna., on this 12th day of June, 1929.

ALFRED A. GRUNDY.