July 18, 1944. S. T. HOWARD 2,353,727

WINDING MACHINE

Filed June 13, 1941

Fig. 1

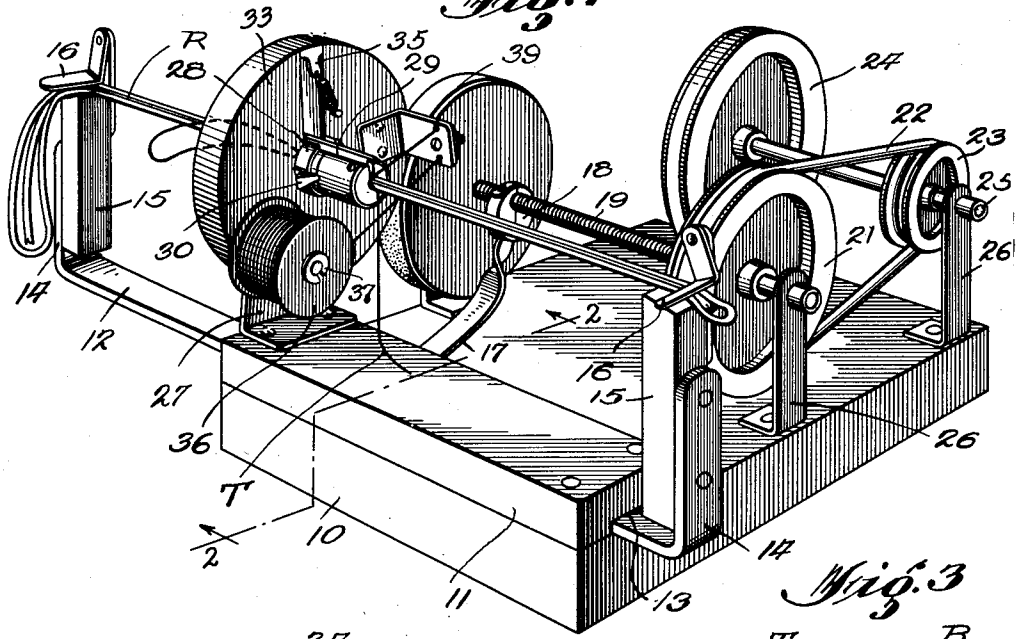


Fig. 3

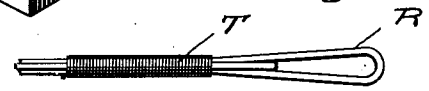


Fig. 2

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WINDING MACHINE

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6 Claims. (Cl. 242—7)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

The invention described herein, if patented, may be manufactured and used by or for the Government for governmental purposes without the payment of any royalty thereon.

This invention relates to and has for a purpose the provision of a winding machine and more particularly an apparatus for winding strand material on a circular-shaped core.

An object of this invention is to provide an apparatus that will wind a circular core with neatness and dispatch.

A further object of this machine is to provide an apparatus that will provide means whereby a circular core will be evenly and quickly covered.

A further object of this invention is to provide a simple and efficient apparatus for covering circular cores economically and yet produce a better and more even article.

With the above and other objects and advantages in view, the invention consists of features of construction, arrangement and operation of parts which will appear in the specification and be finally pointed out in the claims.

While a preferred embodiment of the invention is shown, it will be understood that slight changes in form and minor details of construction may be resorted to without departing from the spirit of the invention and fall beyond the scope of the claims.

Referring now to the drawing, in which similar characters and references in the several figures indicate identical parts:

Fig. 1 is a perspective view of the apparatus embodying the invention.

Fig. 2 is a sectional view taken on the lines 2—2 of Fig. 1.

Fig. 3 is a detail view illustrating a relative arrangement of the strand and core as produced by the operation of the improved apparatus.

Reference now being had to the drawing by numerals, in which 10 indicates a base board, upon which is secured a base 11 which is adapted to receive a sliding carriage 12 within the recess 13, carriage 12 has upturned ends 14 to which are secured clamp-holding members 15 adapted to receive and hold clamps 16 thereon. Secured to the sliding carriage 12 at a position intermediate the ends thereof is a feed arm 17 having secured thereto at its forward end a split nut 18 having threads therein which mesh with the threads on a feed screw 19 which is suitably supported at each end by supports 20. The feed screw 19 has a pulley 21 secured to one end thereof, and the feed screw is adapted to be rotated by means of a belt 22 connecting pulleys 21 and 23. Pulley 23 is mounted at one end of a hollow shaft 25 and a pulley 24 mounted on the other end of this shaft is adapted to be driven by an electric motor and belt not shown. Suitable supports 26 are placed on the baseboard 10 to support the hollow shaft 25.

Secured to the base 11 by well-known means is a bracket 27 to which is rigidly secured a sleeve 28. The sleeve 28 has a slot 29 therein which is adapted to receive the core which is to be wound, the sleeve 28 has a hinged portion 29a which can be locked in fixed position by a spring catch 30. In the forward end of the sleeve 28 is a split guide 31, half of which is fixed to the rigid portion of sleeve 28 and half being fixed to the hinged portion 29a.

The end of the machine at which the winding takes place consists of a bobbin carrying wheel 33 having a slot 34 therein which corresponds and aligns itself with the slot 29 in the sleeve 28. The slot is adapted to be closed by a pivoted gate 35, thereby completing the periphery of the carrying wheel 33. The bobbin carrying wheel 33 has a stem thereon adapted to support the bobbin 36 which is rotatably locked to the stem by a slotted and recessed locking plate 37, also attached to the bobbin carrying wheel 33 by well-known means is a tension plate 38 which is adapted to place a tension on the thread T while the core R is being wound.

Co-acting with the periphery of the bobbin carrying wheel 33 is a rubber-tired wheel 39, which is rigidly secured to the end of the feed screw 19.

The bobbin carrying wheel 33 is thereby caused to rotate by the rubber-tired wheel 39 when the feed screw 19 is rotated by the electric motor, not shown.

In winding cores of any type, it is usual to begin at the left and wind toward the right, and in this instance the core being wound is passed through the slots 34 down into the bobbin carrying wheel 33 and slot 29 in the sleeve 28, the split guide 31 is closed and the gate 35 is moved into position over the slot 34 in the bobbin carrying wheel 33. The core, having been stretched tight, will then be secured in place by clamps 16. The clamps 16 hold the core against rotation at all times so that there is no twisting effect on the core during the winding thereof. When the winding has progressed to the point where right-hand stop 15 will strike the base 11 the operator can loosen the clamps 16, grasp the core already wound and while holding it in a taut position, return the sliding carriage 12 to its extreme right

position and refasten the clamps 16 to the core, then the split nut 18 can be closed on the feed screw 19 and the core at this time will then be in a position so that the winding action can be repeated.

The winding thread from the bobbin 36 is drawn through tension plate 38 and is then carried around the core over toward the operator. A loop is formed and passed back through slot 34 in the bobbin carrying wheel 33 and is pulled down within the opening in the split guide 31. The loop is held in the left hand and the right or free end of the thread is held in the right hand. The bobbin carrying wheel 33 is started to rotate clockwise by means of the motor, not shown, and thus the thread is wound onto the core, the proper spacing of the thread being accomplished by the feed screw. When the winding is complete, the loop at the left is withdrawn from the slot 34 in the bobbin carrying wheel 33. The clamps 16 are released, the thread is cut near the tension plate 38 and this end is passed through the loop, previously referred to. The free end of the thread at the right of the core is used to draw the loop beneath the thread, which has already been wound on the core, thus forming a lock on both free ends of the thread which are then cut close. To wind the particular arrangement shown in Fig. 3, a hook is attached to the right hand clamp and is inserted in the fold to tighten the core for winding. The tension plate 38 will at all times control the tension of the winding and with the aid of the feed screw 19 will accomplish a neat, tight and even winding. In actual operation it has been proven that this apparatus applies winding to a core at the rate of 24 inches per minute.

The invention exemplifies a winding machine by which tow ropes for aerial targets can be wound in such a manner that they will outlast any previous tow rope that has been used for this purpose.

The invention is not to be understood as restricted to the details set forth, since these may be modified within the scope of the appended claims without departing from the spirit and scope of the invention.

Having thus described the invention, what is claimed as new and desired to secure by Letters Patent, is:

1. An apparatus for winding a strand on a core comprising a U-shaped sliding carriage means positioned on the upturned ends of said U-shaped sliding carriage for holding said core against rotation, means for distributing a strand evenly and progressively upon said core, and means for tensioning said strand during the winding operation.

2. An apparatus for winding a strand on a core comprising a U-shaped sliding carriage means positioned on the upturned ends of said U-shaped sliding carriage for holding said core against rotation, means for distributing said strand evenly and progressively upon said core, means for holding said strand while said core is being wound, and means for tensioning said strand during the winding operation.

3. An apparatus for winding a strand on a core comprising a U-shaped sliding carriage, means positioned on the upturned ends of said U-shaped sliding carriage for holding said core against rotation, means for distributing a strand evenly and progressively upon said core, and winding means adapted to hold said strand while said core is being wound, said winding means also being adapted to hold means for tensioning said strand during the winding operation.

4. An apparatus for winding a strand on a core comprising a U-shaped sliding carriage, means positioned on the upturned ends of said U-shaped sliding carriage for holding said core against rotation, means for distributing a strand evenly and progressively upon said core, said holding means adapted to travel in conjunction with said distributing means, means for holding said strand while said core is being wound, and means for tensioning said strand during the winding operation.

5. In a winding mechanism for winding a strand on a core a sliding U-shaped carriage adapted to hold a core at both ends thereof, means for distributing a strand upon said core, a feed arm positioned intermediate the ends of said carriage and the core, one end of said feed arm engaging the carriage, and a feeding means positioned on the other end of said feed arm, said feeding means engaging a feed screw so as to move said carriage whereby said strand is evenly and progressively wound on said core.

6. In a winding mechanism for winding a strand on a core, a sliding U-shaped carriage adapted to hold a core at both ends thereof, means for winding a strand upon said core, means for tensioning said strand while said core is being wound, a feed arm positioned intermediate the ends of said carriage and the core, one end of said feed arm connected to the carriage, and feeding means positioned on the other end of said feed arm, said feeding means engaging a feed screw and movable on said screw for sliding said carriage, whereby said strand is evenly and progressively wound on said core.

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