Dec. 12, 1944. W. SIEGENTHALER 2,365,115

WINDING MACHINE

Filed Dec. 1, 1942

Fig. 1

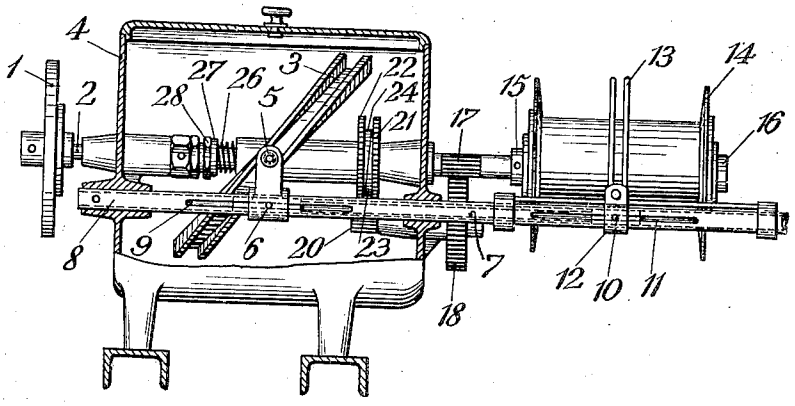
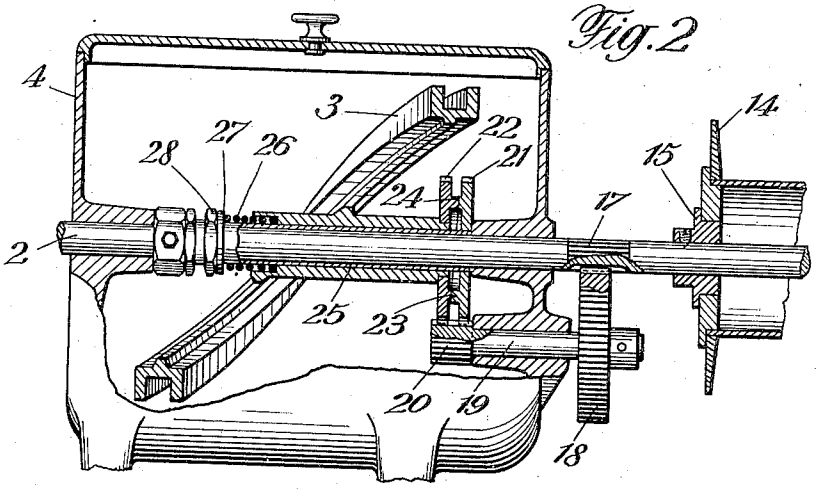


Fig. 2



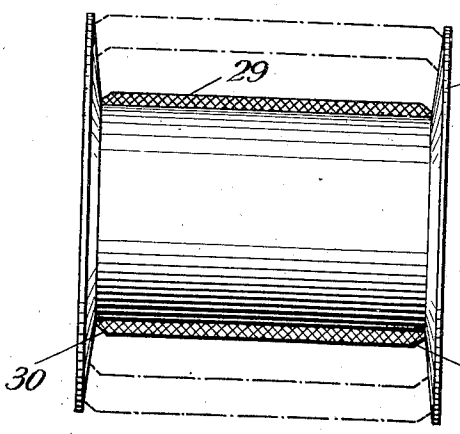


Fig. 3

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WINDING MACHINE

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1 Claim. (Cl. 242—43)

This invention relates to a winding machine in which a thread guide is reciprocated by a rotatable cam member for the purpose of producing crosswinds.

According to the present invention the cam member is actuated by a driving wheel the speed of revolution of which varies from that of an auxiliary wheel arranged laterally thereof so that, due to lateral cooperation of the two wheels, the driving wheel is caused to be shifted axially back and forth in consequence of which the traverse of the thread guide is accordingly varied.

By this means the ends of the thread package are provided with a taper, in a manner known per se, for the purpose of securing the package ends and facilitating the operation of unwinding the thread from the spool. The means for obtaining this result as provided according to the present invention are of simple construction, require but little space and are reliable in operation and can be manufactured at small expense. Due to the small requirement on space of the pair of wheels provided for, these wheels can be accommodated in the usual gear box without any further provisions.

The invention is illustrated as embodied in a crosswinder by way of example only, in the accompanying drawing, in which however only the parts are shown that are necessary for properly explaining the invention.

In the drawing Fig. 1 shows an elevation partly in section;

Fig. 2 is a larger scale axial section of the winding spindle, and

Fig. 3 represents an axial section of the spool on a still larger scale.

On a spindle 2 provided with a friction, that is, a driving disc 1, a traversing disc 3 is rotatably mounted within the gear box 4. Into the circumferential guide groove of the traversing disc 3 projects a driving member 5 which is connected to a bar 7 by means of a pin 6. This bar is arranged in a carrier tube 8 and the connecting pin 6 protrudes through a longitudinal slot 9 formed in the carrier tube 8. A thread guide 12 in the form of a fork 13 for the reception of the winding thread is connected with the bar 7 by means of a stud 10 protruding through a longitudinal slot in the carrier tube 8.

In the operation of the machine the bar 7 is shifted axially back and forth in the tube 8 by the traversing disc 3 while the thread guide 12 operates to build up the winding thread into crosswinds on a relatively large spool 14. This spool is of the type of a flanged spool which is mounted, by means of two supports 15, 16, on the spindle 2 which thus constitutes the winding spindle. On removal of the support 16 from the winding spindle 2 which is axially non-displaceably mounted on the gear box 4 the spools can be doffed each time when they are to be exchanged for a fresh spool required to be wound.

The winding spindle 2 is provided with a toothed portion 17 by means of which the rotational movement of the winding spindle is transmitted to a gear 18 and to the mounting shaft 19 of the latter. The shaft 19, which is mounted on the gear box 4, is in driving engagement with a gear composed of two toothed discs 21 and 22. The individual gears 21 and 22 are provided with laterally projecting rims 23 and 24 respectively which confront each other and mutually enter into bearing engagement by oblique faces. These oblique faces on the two wheel rims 23, 24 incline at corresponding angles of obliquity, as evident from the drawing. The gear 21 is secured to a hollow shaft 25 pushed on the winding spindle 2, whereas the gear 22 is fixed to the hub of the traversing disc 3 which is mounted on the hollow shaft 25. On the hub of the traversing disc 3 a coil spring 26 surrounding the hollow shaft 25 acts in the axial direction, for which purpose this spring abuts against a collar 27 which in turn is backed by a screw nut 28 secured to the hollow shaft 25. The coil spring 26 functions to continually maintain the bearing engagement between the rim 24 of the gear 22 providing the driving wheel of the traversing disc 3, and the rim 23 of the gear 21 serving as an auxiliary wheel.

In the operation of the machine the two gears 21, 22 are driven by the toothed portion 20 on the shaft 19. The number of teeth on the auxiliary gear 21, which is shown to be situated on the right hand side, exceeds that of the teeth on the left hand driving gear 22 by one, whereby the latter leads on the auxiliary gear 21. However, this lead amounts only to a small angular range per revolution since the number of teeth entering into the question approximates, for example, sixty. In consequence of this permanently lasting leading of the driving gear 22 on the auxiliary gear 21 the driving gear 22 is axially displaced by influence of the rims 23, 24, which cooperate with each other by means of their oblique faces, with the result that the traversing disc 3 is accordingly axially displaced.

Starting from the relative disposition of the two gears 21, 22, as assumed in the drawing, in which the oblique faces of their rims 23, 24 bear

snugly against each other, the driving gear **22** is axially shifted to the left until the thickest portions of the rims **23, 24** overlie one another, whereupon the driving gear **22** begins to shift axially in the opposite direction until the thickest portion of the rim **24** overlies the thinnest portion of the rim **23** again, as shown. Thus the driving gear **22**, in rotating, performs a relatively slow axial reciprocating movement, the throw of which is determined by the angle of inclination of the oblique faces on the rims **23, 24**. This axial reciprocation performed by the traversing member **3** results in altering the traverse of the thread guide **12** more or less with respect to the traversing movement effected by means of the guide groove of the traversing disc **3**, whereby the thread package **29** in progress of formation is provided with tapering ends **30, 31** (Fig. 3).

The inclination of the oblique or cam faces provided on the rims **23, 24** of the gears **21, 22** can obviously be varied as required dependent upon the amount of alteration of traverse to be imparted to the thread guide **12** in the sense of decreasing or increasing said traverse as determined by the traversing disc itself. The form of the said cam faces can also be varied. Instead of providing for the driving wheel **22** to lead on the auxiliary wheel **21** the latter can be caused to lead on the former by accordingly choosing the number of teeth for said wheels.

I claim:

In a winding machine, a gear box having walls constituting a mounting frame, a spindle rotatably mounted in the walls of said box and extending beyond said box at both ends, frictional drive means on one end of said spindle, spool mounting means on the other end of said spindle, a traversing disc, means mounting said disc on said spindle within said box, said disc being rotatable and axially slidable relative to said spindle, a reciprocable thread guide bar mounted in the walls of said box and extending adjacent the winding spool and operable by the traversing disc, a toothed auxiliary wheel located laterally of the spindle, means for driving said auxiliary wheel from said spindle, a pair of toothed wheels, and means rotatably mounting said wheels on said spindle to mesh with said auxiliary wheel, said gears having different numbers of teeth from each other, one of said gears being fixedly connected with the traversing disc so as to drive said disc, said gears having adjacent engaging cam surfaces whereby in operation the relative turning movement of the gears moves the traversing disc axially under the influence of the cam surfaces to alter the movement of the thread guide.

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