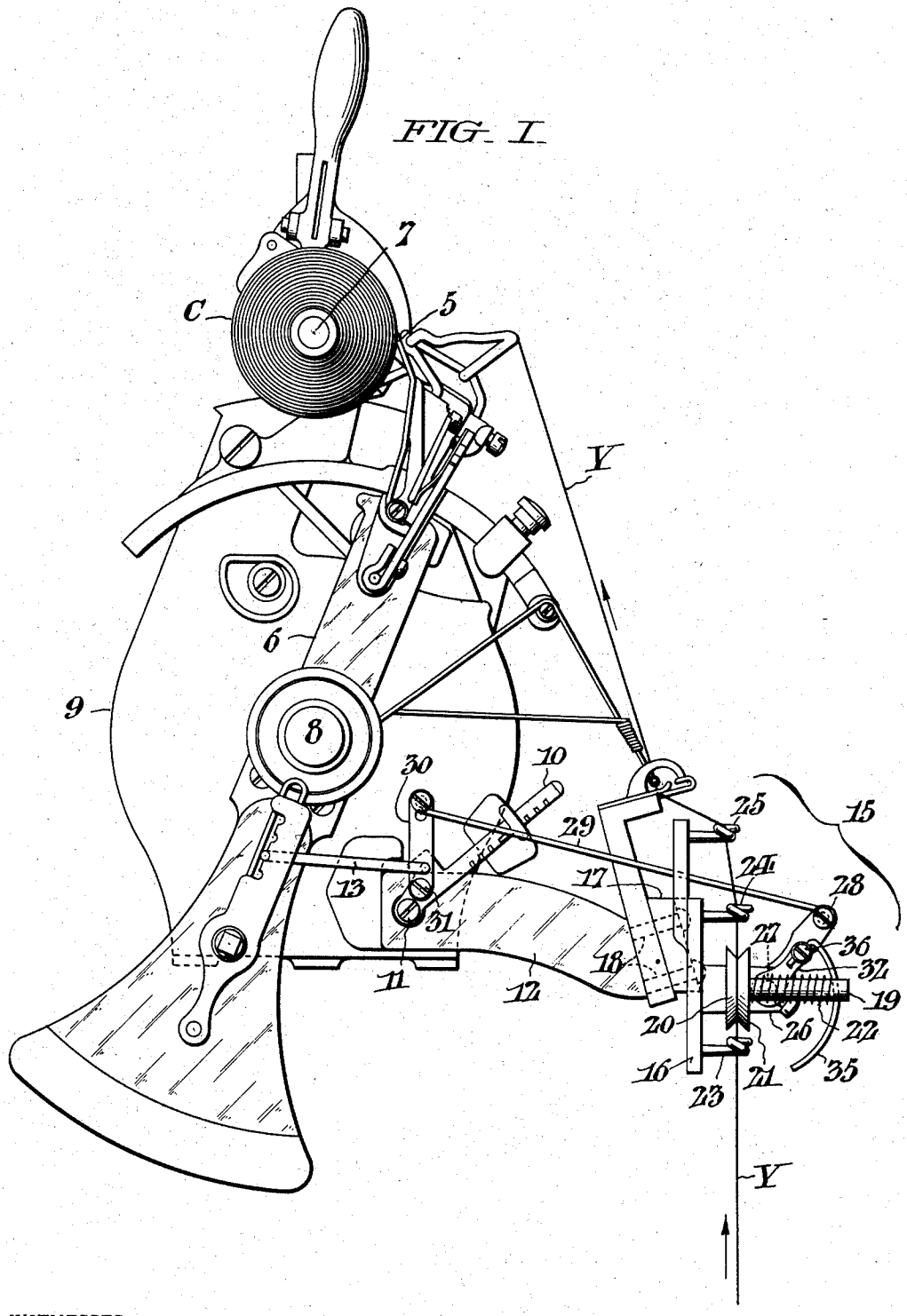
July 17, 1934. L. H. MYERS 1,967,211

YARN TENSIONING DEVICE

Filed Oct. 7, 1933 2 Sheets-Sheet 1

FIG. I.



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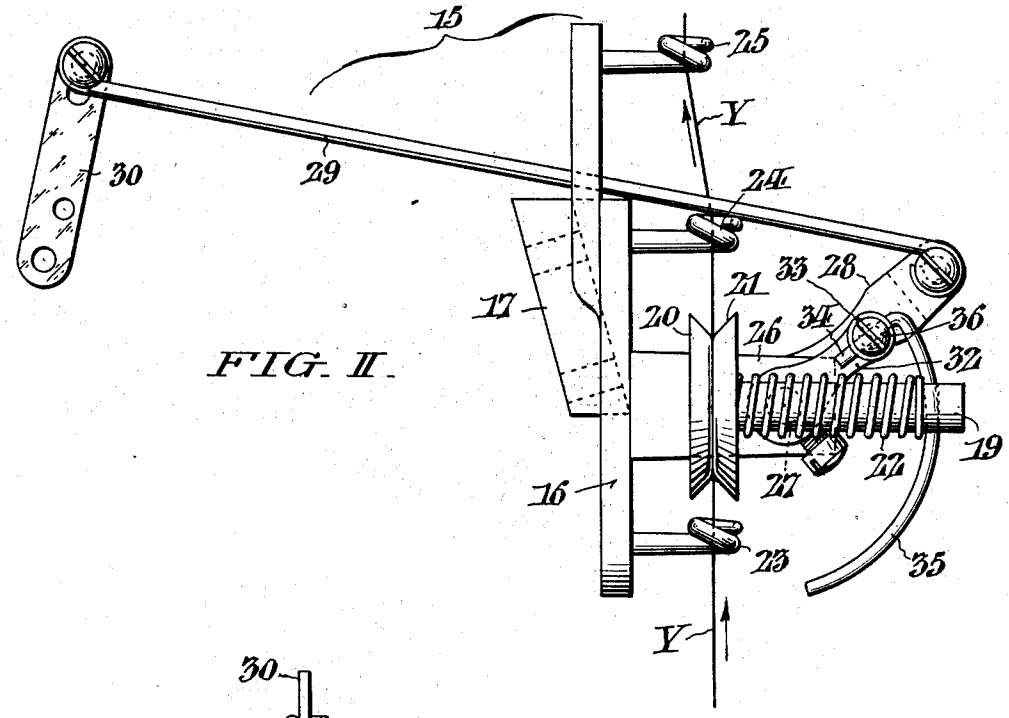


FIG. II.

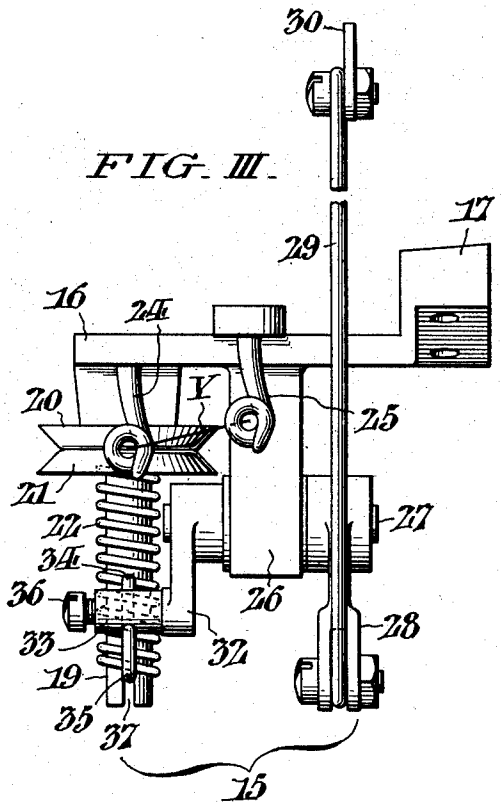
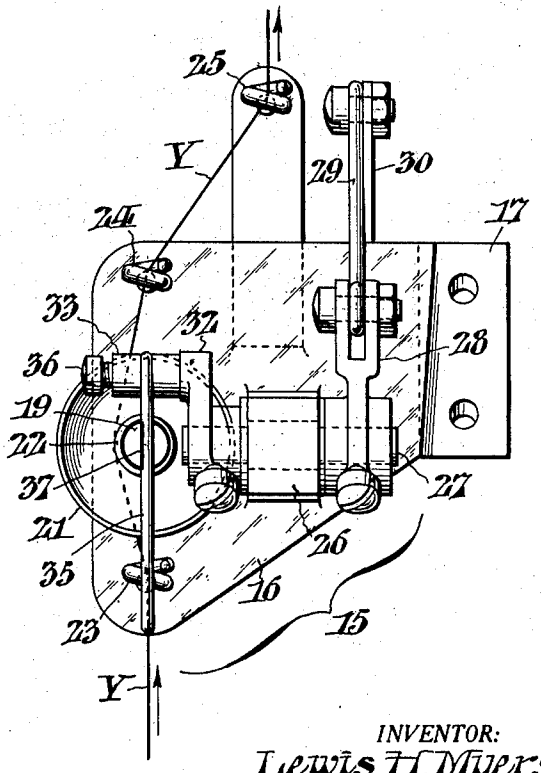


FIG. III.

FIG. IV.



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UNITED STATES PATENT OFFICE

1,967,211

YARN TENSIONING DEVICE

Lewis H. Myers, Philadelphia, Pa., assignor to Provident Trust Company of Philadelphia, Philadelphia, Pa., a corporation of Pennsylvania, trustee

Application October 7, 1933, Serial No. 692,614

5 Claims. (Cl. 242—150)

This invention relates to yarn tensioning devices; and it has reference more particularly to yarn tensioning devices intended for use in connection with winding machinery.

The chief aim of my invention is to provide a simple, inexpensive and reliable winding device which is readily attachable to existent forms of winding machines without entailing any changes either in the construction or in the normal operation of such machines; and which is capable moreover of accurately controlling the yarn such that the restraint imposed thereon is compensatively decreased in direct proportion to the increase in its speed incident to the diametral growth of the package being formed, thereby to preassure uniformity both as to size and content of the packages successively wound on the machines.

Other objects and attendant advantages of this invention will be manifest in the detailed description following of the drawings aforementioned, wherein Fig. I shows a front view of a standard winding machine fitted with my improved tensioning device.

Fig. II is a corresponding front elevation of the tensioning device drawn to a larger scale.

Fig. III is a plan view of the same; and

Fig. IV is an end view thereof.

The winding machine depicted in Fig. I is of a well known type wherein the yarn Y is drawn from a source of supply (not shown) and directed by a traversing guide 5 on a counter-weighted swinging frame 6, to a spindle 7 whereon the yarn package C is formed by rotation of the spindle at a constant speed. The swinging frame 6 is fulcrumed at 8 on the frame 9 of the machine; and a differential weight lever 10 pivoted at 11 to a fixed bracket arm 12 of the machine frame is connected to said swinging frame by a link 13 for capacity to cooperate therewith in maintaining the traversing guide 5 in even bearing contact with the surface of the package C during the winding—all in a manner well known in the art.

The novel means which I have devised for compensatively tensioning the yarn as the speed of the latter increases with the gradual growth of the package C on the spindle is comprehensively designated by the numeral 15 in Fig. I as well as in the larger scale detail views shown in Figs. II–IV. This tensioning means 15, it will be observed, is in the form of an attachment comprising a plate-like bracket 16 with an angularly offset portion 17 which is secured by screws 18 to the correspondingly sloped end of the fixed arm 12 of the winding machine.

Anchored in the bracket 16 is a horizontal stud 19 whereon is mounted a pair of opposingly-beveled freely-rotative circular disks 20, 21 which are held in yielding pressure contact by a helical spring 22 surrounding the projecting outer end of said stud. The yarn Y is caused to pass vertically and tangentially between the disks 20, 21 by a pair of aligned guides 23, 24 on the bracket respectively above and below said disks. After having traversed the disks 20, 21 as just explained the yarn is directed by still another guide 25 on the bracket 16 on its way to the traversing guide 5 of the winding machine. Journalled in a bearing lug 26 of the bracket 16 is a rock shaft 27 having attached to one end thereof an arm 28. This arm 28 is connected by means of a link 29 of stout wire to a supplemental arm 30 which is secured by a screw 31 (Fig. I) to the differential weight lever 10 of the winding machine. To the other end of the rock shaft 27 is secured another arm 32 with a laterally projecting boss 33 at its outer end. This boss 33 is diametrically pierced to take the anchorage portion 34 of an arcuate tail 35 formed from stout wire, said tail being secured with capacity for adjustment radially of the rock shaft 27 by a set screw 36 engaging a tapped axial hole in the boss. As shown, the tail 35 is curved eccentrically with respect to the shaft 27 and projects through a diametral slot 37 (Figs. III and IV) in the outer end of the stud 19 aforementioned to serve as a movable abutment for the spring 22.

The operation of my improved yarn tensioning device is as follows: As the swinging frame 6, carrying the traversing guide 5, gradually moves clockwise during the formation of the yarn package on the spindle 7, anti-clockwise movement is concurrently induced in the differential weight lever 10 through the link 13 as usual. This movement of the differential weight lever 10 is in turn communicated through the supplemental arm 30 attached thereto, the link 29, the arm 28 and the rock shaft 27, to the arm 32. With attendant gradual upward movement of the eccentrically-curved tail 35 of the arm 32 it will be seen that the spring 22 will be progressively relaxed with corresponding decrease in the pressure of the disks 20 and 21 and the restraint upon the yarn. Thus as the speed of the yarn changes with diametral growth of the yarn package C, the tension on the same will be compensatively varied. This action will obviously predetermine accurate uniformity in the size and content of

the yarn packages successively wound on the spindle 7 so that no difficulty whatever will be experienced in subsequent withdrawal of the yarn from the packages incident to knitting or weaving operations.

By adjusting the curved tail 35 of the arm 32 as permitted by the screw 36, the tensioning device may be set as desired or required for operation upon yarns of different kinds or gauges.

Having thus described my invention, I claim:

1. A yarn tensioning device for winding machines comprising a pair of opposing restraining members between which the yarn is passed enroute from a source of supply to the package being wound: a helical spring influential upon the restraining members; an arm with an eccentrically curved tail constituting a movable abutment for the spring; and means responsive to changes in the diameter of the yarn package for actuating the arm to compensatively regulate the pressure of the spring during the winding.

2. A yarn tensioning device for winding machines comprising a pair of opposed coaxial disks between which the yarn is passed enroute from a source of supply to the package being wound; a helical spring influential upon the spring; an arm attached to a shaft in transverse relation to the axis of the disks, said arm having an eccentrically curved tail constituting a movable abutment for the spring; and means responsive to changes in the diameter of the yarn package being wound for rocking the arm to compensatively regulate the pressure of the spring during the winding.

3. A yarn tensioning device for winding machines comprising a pair of opposing coaxial disks free on a fixed stud, between which the yarn is passed enroute from a source of supply to the package being wound; a helical tension spring surrounding the stud and exerting pressure on the disk; an arm attached to a shaft in transverse relation to the axis of the stud, said arm having an eccentrically curved arm passing through a notch in the end of the stud and constituting a movable abutment for the spring; and means responsive to changes in the diameter of the yarn package for rocking the shaft and the arm to compensatively regulate the pressure of the spring during the winding.

4. A yarn tensioning means for winding machines wherein a counterweighted pivoted frame and a coordinated differential weight lever cooperate to maintain a traversing guide in surface contact with the yarn package being wound, comprising a pair of opposing restraining members between which the yarn is passed enroute from a supply source to the package being wound; a helical spring influencing the restraining members; an arm with an eccentrically curved tail forming a movable abutment for the spring; and means connecting the arm with the differential weight lever aforesaid whereby the tension of the spring is regulated compensatively with changes in the diameter of the package during the winding.

5. A yarn tensioning attachment for winding machines comprising a bracket with means for connecting it to a fixed part of the winding machine; a stud carried by the bracket; a pair of opposing disks free on the stud; and guides on the bracket respectively above and below the disks to direct the yarn between said disks enroute from a source of supply to the yarn package being wound on the machine; a helical spring surrounding the stud and exerting its pressure on the disks; a rock shaft in transverse relation to the stud; an arm on the shaft having an eccentrically curved tail extending through a notch in the end of the stud and constituting a movable abutment for the spring; and actuating connections between the rock shaft and a moving part of the machine, whereby, through actuation of the arm aforesaid the tension of the spring is regulated compensatively with changes in the diameter of the yarn package during the winding.

LEWIS H. MYERS.