April 20, 1926. 1,581,346

R. K. HOHMANN

ROTARY TAKE-UP

Filed Feb. 16, 1924

Fig. 1,

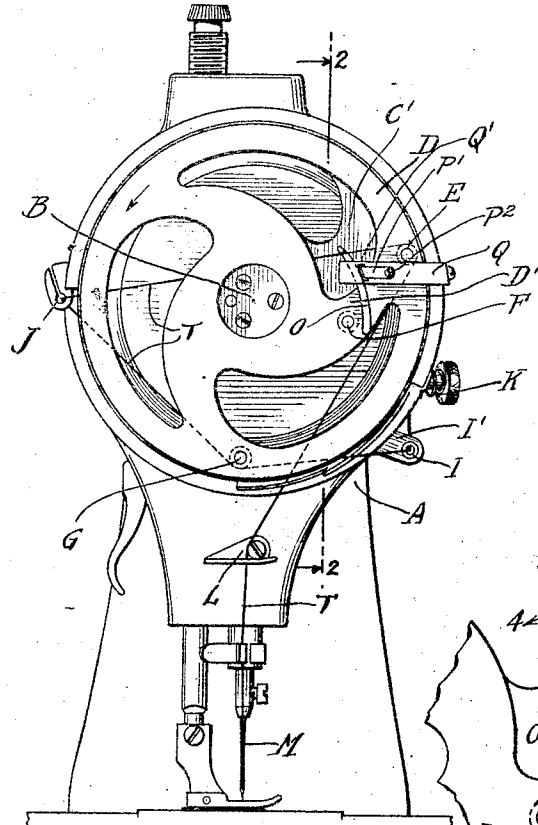
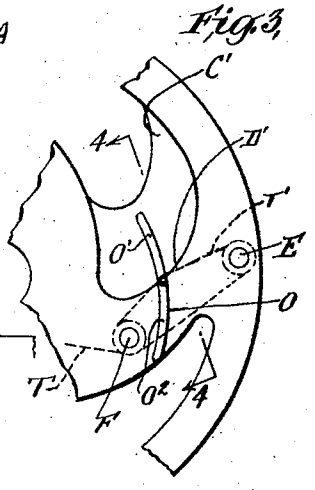


Fig. 3,



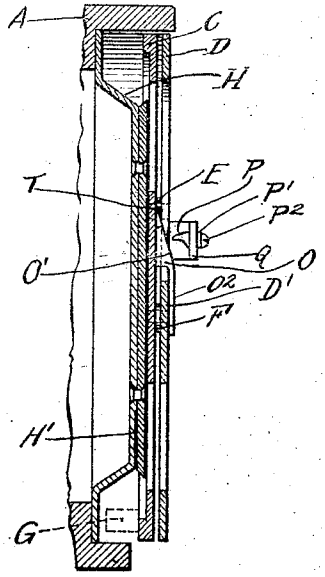


Fig. 2,

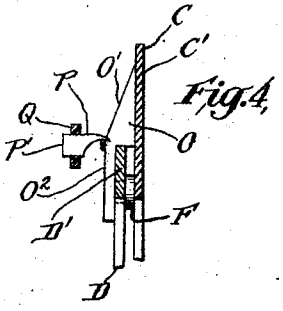


Fig. 4,

INVENTOR

Richard K. Hohmann

BY

J. E. Hubbell

ATTORNEY

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UNITED STATES PATENT OFFICE.

RICHARD K. HOHMANN, OF PERU, INDIANA, ASSIGNOR TO HOHMANN SEWING MACHINE COMPANY, OF PERU, INDIANA, A CORPORATION OF INDIANA.

ROTARY TAKE-UP.

Application filed February 16, 1924. Serial No. 693,175.

To all whom it may concern:

Be it known that I, RICHARD K. HOHMANN, a citizen of the United States, and resident of Peru, in the county of Miami and State of Indiana, have invented certain new and useful Improvements in Rotary Take-Ups, of which the following is a specification.

In the operation of sewing machines having a rotary takeup mechanism, much trouble has been experienced heretofore, from the tendency of the thread to wrap itself around the thread deflecting parts of the takeup mechanism when, as a result of the breaking of the needle thread at or adjacent the work, the portion of the thread passing through the takeup mechanism is released from the control to which it is mechanically subjected by the thread guiding and tension provisions of the machine. This tendency of the thread to wrap about parts of, and to wind up in the takeup mechanism is especially objectionable in the case of the common type of rotary takeup mechanism, in which the takeup mechanism comprises a pair of spaced-apart disks or plates, one of which is secured to the end of the main shaft of the sewing machine and carries the second part through thread deflecting studs eccentric to the axis of the main shaft and extending across the thread passage between the plates or disks. In such a takeup mechanism, when the needle thread breaks at or adjacent the work, a considerable amount of thread frequently wraps tightly about the thread deflecting studs before the operator, following his discovery that the needle thread is broken, brings the machine to a standstill. The thread thus wrapped up in the takeup mechanism is wasted, and, what is more important, the removal of the thread so wrapped up is a time consuming operation which may, and does frequently result in a roughening of one or the other of the adjacent surfaces of the takeup plates by the screwdriver or other implement ordinarily employed by the operator to remove the thread wound up in the takeup machanism. This roughening of the thread guiding surfaces of the takeup plates is in itself a matter of some importance, as the thread is apt to be caught on and broken by the roughened surfaces of the plates when the machine shaft is again put into regular operation.

Various expedients have heretofore been proposed for preventing or minimizing the objectionable consequences of the thread winding up in the takeup mechanism following a breakage in the needle thread at the work, but none of these expedients has been entirely satisfactory, and the general object of the present invention is to provide improved means for avoiding the difficulty heretofore experienced from the winding up of the thread in the takeup mechanism when the needle thread breaks at or adjacent the work.

In the preferred practical mode of carrying out my invention in connection with a takeup having the spaced-apart plates referred to above, I provide the takeup with a special thread deflecting part secured to the plates and extending through an opening in the front plate of the takeup with one portion of its outer thread deflecting edge in front of the outer surface of the front takeup plate and with another portion of said edge inclined to the planes of said plates and extending across the thread passage between the plates in such position relative to the regular thread deflecting parts crossing such space that it will have no, or at least no significant effect on the thread in the normal operation of the machine, but, in case of thread breakage, will engage the thread winding, or tending to wind about said regular thread deflecting parts, and cam or wedge a portion thereof through the opening in the front plate, in position to be engaged by a stationary or non-rotatable thread stripping part or knife which I mount on the stationary framework of the sewing machine.

The various features of novelty which characterize my invention are pointed out with particularity in the claims annexed to and forming a part of this specification. For a better understanding of the invention, however, its advantages and specific objects attained with its use, reference should be had to the accompanying drawings and descriptive matter in which I have illustrated and described a preferred embodiment of my invention.

Of the drawings:—

Fig. 1 is an end elevation of a portion of a sewing machine;

Fig. 2 is a partial section on the line 2—2 of Fig. 1;

Fig. 3 is a view taken similarly to Fig. 1 but on a larger scale and showing a portion only of the mechanism shown in Fig. 1; and

Fig. 4 is a partial section on the line 4—4 of Fig. 3.

In the embodiment of my invention illustrated in the drawings, A represents the arm of a sewing machine having a rotary takeup comprising an apertured disk or wheel-like part C secured to the end of the main shaft B of the sewing machine, and a second apertured disk or wheel-like part D generally similar in shape to the part C and placed immediately in front of the latter, from which it is separated by a space forming a thread passage. The part D is secured to the part C by a thread deflecting stud E located adjacent the peripheries of the parts C and D, and by a stud F angularly to the rear of the stud E, having reference to the direction of rotation of the takeup, which, as shown, is in the counter-clockwise direction. The takeup mechanism as shown also comprises a thread deflecting stud G carried by the disk C adjacent its periphery and angularly to the rear of the stud F. The stud G projects from the rear face of the disk C and travels in the annular space between the peripheral portions of the disk C and a stationary part H, which is secured to the arm A, and is provided with a central passage for the shaft B. The part H is of dish-like shape with its body portion closely adjacent to the disk C, and is formed with a kerf H′ in its lower portion, which is open at its lower edge and forms a thread passage for the portion of the needle thread T extending between thread guides I and J at the opposite sides of the takeup. The thread T passes from the usual needle thread tension device K to the thread guide I, which, as shown, comprises an eye in the end of a lever I′, the latter being adjustable manually or automatically in a known manner to vary the thread takeup as the thickness of the work sewed varies. The thread guide J is in the form of an eye formed in or supported by the arm A. From the thread guide J the thread passes through the thread space between the disks C and D and over the thread deflecting studs E and F, to a stationary thread guide L carried by the arm A, and thence to the needle M. In so far as above described, the takeup mechanism is of the special type disclosed and claimed in my prior application Serial No. 511,407, filed October 29, 1921, and primarily intended for use in a sewing machine developed by me for the rapid formation of stitches with a rotary hook stitch forming mechanism in which the thread-holding bobbin is much larger than has heretofore been used in high speed sewing machines, so that the takeup movement given the needle thread is unusually great in extent. The present invention which I am about to describe, is not restricted, however, to use with the particular takeup mechanism shown, but is adapted for use with any of the older forms of rotary takeup mechanisms which usually comprise parts analogous to the parts C, D, J, and L of the mechanism illustrated herein.

The parts C and D, as has long been common, are cut away to form hub-like body and rim portions and connecting curved spoke portions or arms C′ and D′, whereby the weights of these parts of the takeup mechanism are desirably reduced, and the thread is open to inspection and manipulation when this is necessary in initially threading the machine or as a result of thread breakage. The special thread deflector O provided in accordance with the present invention, extends across the thread passage between the disks C and D, and projects through the opening between the spoke D′ to which the stud F is connected and the spoke D′ angularly in advance thereof. As shown, the member O is in the form of a metal bar lying between, and extending transversely to the line connecting the studs E and F, and comprises a portion lying in front of the spoke D′ to which the stud F is connected, and a second portion in advance of the spoke D′ which bears against the adjacent spoke C′ which is widened for the purpose. The member O may be brazed or otherwise secured to one or both of the adjacent spokes C′ and D′. The rear portion O^2 of the outer edge of the member O may be, and is shown as parallel to, and in front of the disk D, but the front portion O′ of said outer edge is inclined to the planes of the disks C and D, so that it forms an inclined cam-like thread deflecting surface extending across the space between the disks C and D and through the opening between the adjacent spokes D′, merging into the edge portion O^2 in front of the front surface of the disk D.

A thread stripping device P co-operates with the deflector O to engage the thread wrapping or tending to wrap around the studs E and F in case of needle thread breakage, as hereinafter described. As shown, the stripping device P is in the form of a knife blade, which extends transversely to the planes of the disks C and D through a slot Q′ in the end of a support Q which is secured to the arm A and extends in front of the disk D. The body P′ of the knife P is shown as extending parallel to the support Q and secured to the latter by a screw P^2. Advantageously and preferably, the stripping device P is so located that it will engage thread wrapped about the studs E and F when the latter are in the position occupied by them at, or near the end of each stitch tightening operation.

In the normal operation of the machine, the portion of the thread T running from the guide J, to the stud E will be held by the tension on the thread at the rear of the inner end of the stripper O as shown in Fig. 2, when the thread passes the stripper P. In case of needle thread breakage, however, the thread wrapping about the studs E and F is drawn up over the cam edge O′ of the deflector, as shown in Figs. 3 and 4, in position to be engaged by the stripper P as the takeup revolves. On such engagement, the stripper P pulls the thread off the studs, or, and more usually with the machine in rapid operation, the stripper P cuts the thread. In consequence, the thread running from the thread guide J through the space between the disks C and D will be shortened, or will have its free end pulled out between the adjacent arms D′, so that it will not thereafter wrap around the studs E and F.

The use of the present invention thus avoids the thread wastage which results when, following a breakage of the needle thread, the latter is permitted to wind up in the takeup mechanism until the operator discovers the trouble and stops the machine. This item of thread wastage is of some importance in the case of high speed machines, as considerable thread will ordinarily be wound up in the machine before the operator brings the machine to a standstill following a breakage of the needle thread. The thread wastage thus produced is relatively unimportant, however, in comparison with the time and labor lost in removing the thread wound up in the takeup mechanism, and, moreover, the removal of this thread, which the operator ordinarily effects by means of a screwdriver or any analogous implement which may be at hand, frequently involves scoring the adjacent surfaces of the thread takeup parts C and D, and the burrs or rough edges thus formed on these faces tend to catch and break the thread in the subsequent operation of the machine.

While in accordance with the provisions of the statutes I have illustrated and described the best form of my invention now known to me, it will be apparent to those skilled in the art that changes may be made in the form of the apparatus disclosed without departing from the spirit of my invention, as set forth in the appended claims.

Having now described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a rotary takeup mechanism for sewing machines comprising a rotating thread deflecting means about which the thread tends to wind up in case of thread breakage, the improvement which consists in a thread deflector rotating with said means and located with respect thereto in position to be engaged by the thread wrapping around said means and shaped to deflect a portion of the thread so engaging it laterally out of the path of movement of said means.

2. In a rotary takeup mechanism for sewing machines comprising rotating thread deflecting means about which the thread tends to wind up in case of thread breakage, the improvement which consists in a thread deflector rotating with said means and located with respect thereto in position to be engaged by the thread wrapping around said means and shaped to deflect a portion of the thread so engaging it laterally out of the path of movement of said means, and a non-rotating thread stripper adapted to engage said deflected thread portion.

3. In a rotary takeup mechanism for sewing machines comprising rotating thread deflecting means about which the thread tends to wind up in case of thread breakage, the improvement which consists in a thread deflector rotating with said means and located with respect thereto in position to be engaged by the thread wrapping around said means and shaped to deflect a portion of the thread so engaging it laterally out of the path of movement of said means, and a non-rotating thread knife against which said deflected thread portion is moved by the rotation of said means.

4. In a rotary takeup mechanism for sewing machines, the combination with a plate-like member rotating about an axis, and a pair of thread deflecting parts mounted on said member at one side thereof and located at different distances from said axis, said member being formed with an opening adjacent said parts, of a thread deflector connected to said member and projecting through said opening and having an edge inclined to and extending across the path of movement of said parts, in position to engage thread wrapping about said parts and deflect a portion thereof through said opening.

5. In a rotary takeup mechanism comprising a pair of plate-like members rotating about an axis and separated by a thread passage and thread deflecting studs extending across said passage and connecting said members, one of the latter being formed with an opening adjacent said studs, the improvement which consists in a thread deflector secured to said members and having an inclined edge which extends through said opening and across said thread passage and serves to deflect a portion of any thread wrapping about said studs out of said passage and through said opening.

Signed at New York city in the county of New York and State of New York this 13th day of February A. D. 1924.

RICHARD K. HOHMANN.