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P. DIEHL & M. HEMLEB.

ROTARY TAKE-UP FOR SEWING MACHINES.

APPLICATION FILED JULY 22, 1902.

NO MODEL.

Fig. 1.

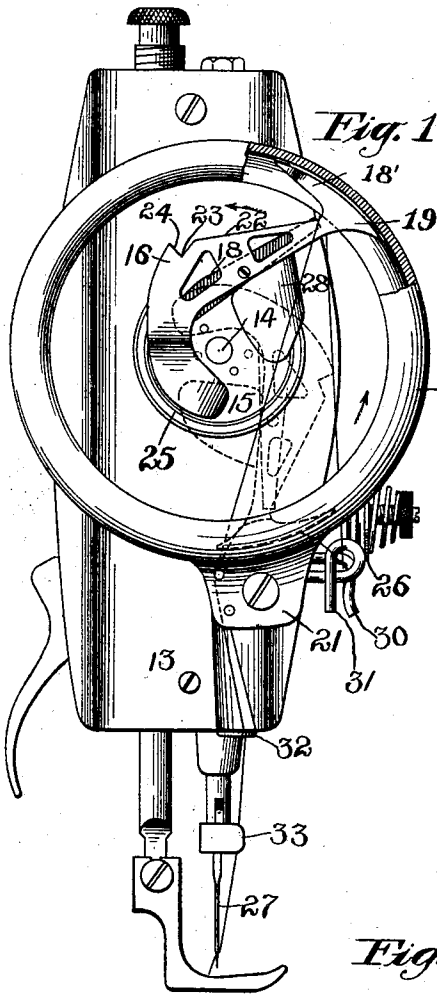


Fig. 2.

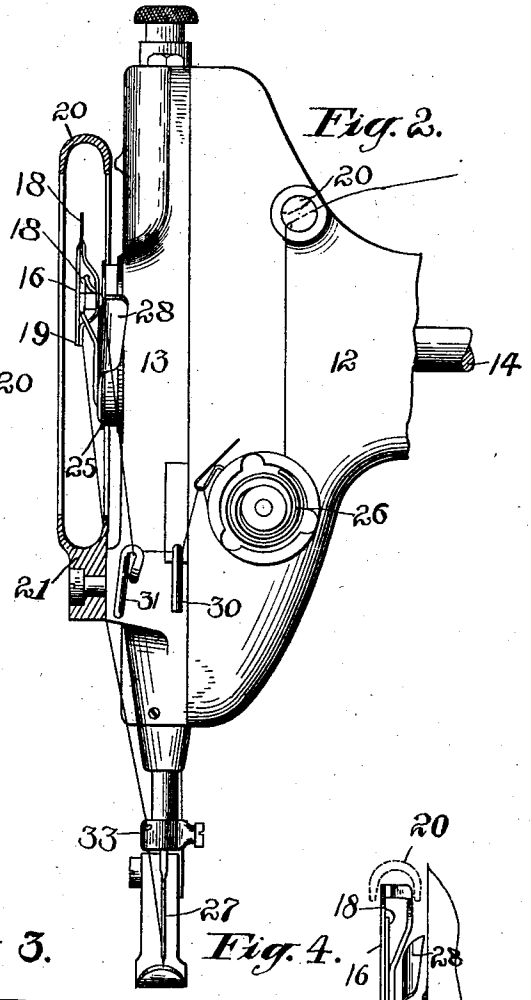


Fig. 3.

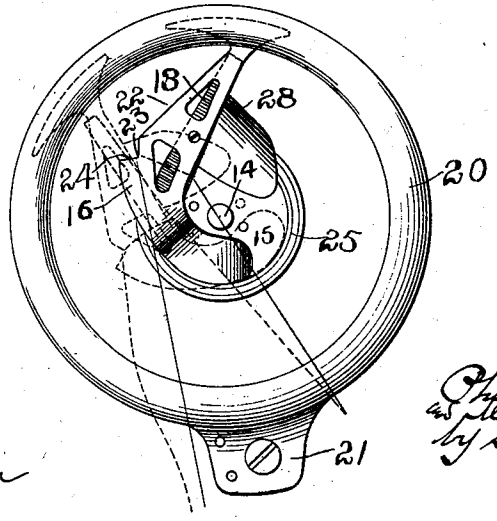
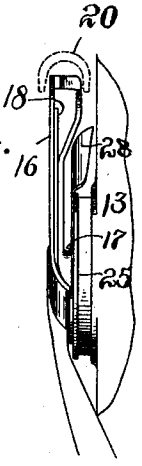


Fig. 4.



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No. 739,157. Patented September 15, 1903.

UNITED STATES PATENT OFFICE.

PHILIP DIEHL AND MARTIN HEMLEB, OF ELIZABETH, NEW JERSEY, ASSIGNORS TO THE SINGER MANUFACTURING COMPANY, A CORPORATION OF NEW JERSEY.

ROTARY TAKE-UP FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 739,157, dated September 15, 1903.

Application filed July 22, 1902. Serial No. 116,544. (No model.)

To all whom it may concern:

Be it known that we, PHILIP DIEHL and MARTIN HEMLEB, citizens of the United States, residing at Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Rotary Take-Ups for Sewing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to that class of rotary take-ups for sewing-machines embraced by United States Patents Nos. 705,221, 705,227, and 705,228, granted July 22, 1902, and comprises certain improvements on the take-up of the said patents.

In the present invention the guard surrounding the rotary take-up arm on which the thread moves in and out for the thread-slackening and the stitch-tightening or take-up operations is fixed to the head or face plate of the machine and overlaps the outer end of the said take-up arm, so as to prevent the needle-thread from escaping therefrom and also so as to protect the attendant, whose hands might otherwise be injured by the rotary take-up arm. Also in the present invention the inner part of the rotary take-up arm is provided with a thread-detaining shoulder, which prevents a too-rapid thread-slackening operation while the needle is descending, and the present invention also provides a rotary guard which overhangs the stationary unthreading guard hub or ring in such a manner as effectively to prevent the needle-thread from catching on the said guard hub or ring excepting when the thread accidentally breaks and it is desired to unthread the take-up to prevent the thread from becoming entangled therewith.

In the accompanying drawings, Figure 1 is a front view of the head of a sewing-machine embodying the invention, and Fig. 2 is a side view of the same with the take-up-arm guard in section. Fig. 3 is a detail front view of the take-up, showing the take-up arm in different positions in full and dotted lines. Fig. 4 is a detail side view of part of the take-up device.

Referring to the drawings, 12 denotes the head at the forward end of a sewing-machine bracket-arm of usual construction, and 13 the face-plate secured to said head. The take-up shaft 14 is preferably mounted in a suitable bearing in the face-plate 13 and is rotated from the needle-bar-driving shaft in any suitably manner, but preferably by the means fully shown and described in the patents aforesaid. Connected to the shaft 14 to rotate therewith is a hub or disk 15, which carries the take-up arm 16, extending outward from said hub or disk, and which arm is preferably tangentially disposed, as shown in the drawings, relative to its axis of rotation or relative to the axis of rotation of the said hub, and between the inner part of the said arm and the said disk is a shoulder 17, on which one limb of the loop or bight of needle-thread rests during a part of the thread-slackening operation. The take-up arm 16 preferably comprises two separated parts or plates between which is pivoted a thread-detaining lever 18, operated from a stationary cam, as fully explained in United States Patent No. 705,221, said lever serving to prevent an inward thread-slackening movement of a loop of needle-thread until a stitch has been fully tightened, as set forth in said patent.

The take-up arm 16 preferably terminates at its outer end in forwardly and backwardly extending fingers 18 and 19, forming a continuation or a part of said arm, said fingers constituting the outer end or part of said arm extending within and being preferably overlapped on both sides by the inwardly-projecting flanges of a hollow guard-ring 20, attached by its shank or peripheral projection 21 to the face-plate 13, or the said ring might be otherwise mounted on the head 12. The hollow guard-ring 20 serves as a housing for the outer end of the rotating take-up arm to protect the hands of the attendant against accidental injury, and it also serves as a guard to prevent the escape of the needle-thread from the said arm during the operation of the machine. For the last-named purpose the guard 20 need only be a segment inclosing the outer end of the take-up arm when the latter is in its lower or downturned position; but as a safety device for the protection of the attendant the said guard is

preferably formed as a complete hollow ring overlapping the outer end of the said take up arm.

In Fig. 1 the take-up arm is represented in dotted lines in the position which it assumes when the thread is fully slackened and a loop is about to be cast over the shuttle or thread-case and the take-up or stitch-tightening operation is about to commence, while in the same figure the take-up arm is shown in full lines in the position it occupies when the stitch has been fully tightened and the thread is about to be released from the shoulder at the outer end of the thread-detaining lever 18 for the thread-slackening operation. During the first part of the thread-slackening operation the loop of thread slides downward on the inclined face 22 of the take-up arm, enters the notch 23, formed in said arm between the inner and outer ends thereof, and rests on the shoulder 24, afforded by said notch, and which shoulder is at this time at the lower side of said notch, said shoulder then moving downward at about the same speed as the descending needle, so as to let off the thread just fast enough to meet the requirements of the needle until the latter has fully completed its descent, and as the needle rises and its loop is taken by the hook or shuttle the loop of needle-thread is disengaged from the said shoulder, thus quickly giving up slack thread for the requirements of the hook or shuttle in carrying the needle-thread around the locking-thread supplied from a stationary thread-case or a shuttle, as the case may be.

In Fig. 3 the take-up arm is shown in full lines in position to retain the needle-thread on the shoulder 24 and also on the shoulder 17, while the position of the said arm denoted by dotted lines in said figure is such as about to permit the escape of said thread from said shoulder 24. As the take-up arm continues its movement from the position shown by dotted lines in Fig. 3 to the fully-thread-slackened position (denoted by dotted lines in Fig. 1) the thread also escapes from the shoulder 17 and slides downward and outward on the now reversed take-up arm in readiness to be caught by the outer end of said arm as the latter rises from the dotted-line position to the full-line position of Fig. 1 to perform the take-up or stitch-tightening operation.

Surrounding the hub or disk 15 of the rotary take-up is a stationary guard ring or hub 25 on the face-plate, and which ring or hub, should the needle-thread accidentally break between the take-up and the needle 27, will catch the loose end of thread, so that the latter will be wound on said ring or hub and be withdrawn from the rotary take-up, thereby unthreading said take-up, and thus preventing the thread from being entangled therewith and wound up thereon, all as fully set forth in United States Patent No. 705,328, hereinbefore referred to.

To prevent the needle-thread from catching on the ring or hub 25 excepting when it is accidentally broken, the rotating hub or disk 15 is preferably provided with a thread-guard 28, which overhangs the stationary guard ring or hub 25 in such a manner that when during the early part of the thread-slackening operation the loop of thread is sliding downward and inward on the take-up arm said loop will be deflected away from said hub. Thus in the normal operation of the machine the inner limb of the loop of thread will be taut when it passes the thread-guard 28, so that said guard will prevent it from catching on the guard ring or hub 25; but should the thread break between the take-up and the work the thread will be so slack that the rotary take-up will wind it about the said guard ring or hub, and thus withdraw the broken end of thread from the take-up, thereby preventing the thread from being entangled with or wound upon the said take-up, as fully set forth in said patent No. 705,328.

The take-up guard-ring 20 is attached at its lower part to the head or face plate, leaving a free space for the passage of the thread (in threading the take-up) between the upper part of said take-up guard-ring and the face-plate; but the upper part of said ring is so closely adjacent to the face-plate or to a swell or projection thereon that it will be braced against the face-plate if accidentally pressed against with any considerable force, as in handling the machine or otherwise, and thus danger of bending or displacing the said guard-ring will be avoided.

The needle-thread runs from the spool or thread-supply through a thread-guide 29 to the tension device 26, thence below a thread-controller 30, rising and falling with the presser-foot, to a thread-guide 31, thence to and around the take-up arm 16, and thence through thread-guides 32 and 33 to the needle 27, a loop of needle-thread being always retained on said take-up arm during the operation of the machine and such loop sliding inward and outward on said arm for the thread-slackening and the stitch-tightening or take-up operations, as hereinbefore set forth.

The invention is not to be understood as being limited to the details of construction herein shown and described, as these may be varied widely without departing from the essential features of the invention, as will be understood.

Having thus described our invention, we claim and desire to secure by Letters Patent—

1. In a sewing-machine, the combination with stitch-forming devices, of a rotary take-up arm, on which the needle-thread slides in and out for the thread-slackening and take-up operation, and which arm is tangentially disposed relative to its axis of rotation, and a stationary guard outside of said arm.

2. In a sewing-machine, the combination with a rotary disk or hub, of a take-up arm

projecting outward from the same, and on which arm the needle-thread slides in and out for the thread-slackening and the take-up operations, and a stationary guard outside of said arm and overlapping the outer end thereof, and thus preventing the thread from escaping from said arm, as also housing or guarding the outer end of said arm.

3. In a sewing-machine, the combination with stitch-forming devices, of a rotary take-up arm on which the needle-thread slides inward and outward for the thread-slackening and the take-up or stitch-tightening operations, and which arm is provided, between its outer and inner ends, with a thread-detaining shoulder which momentarily controls the thread-loops during the thread-slackening operation.

4. In a sewing-machine, the combination with stitch-forming devices, of a rotary take-up arm on which the needle-thread slides inward and outward for the thread-slackening and the take-up or stitch-tightening operations, and which arm is provided between its ends with a thread-controlling shoulder, and a stationary circular guard surrounding said arm and overlapping the outer end thereof.

5. In a sewing-machine, the combination with stitch-forming devices, of a rotary take-up, a stationary guard ring or hub encircling the hub of said take-up, and a rotary guard on said take-up hub overhanging the said stationary guard ring or hub, and preventing the needle-thread from catching on the said stationary guard ring or hub in the normal operation of the machine.

6. In a sewing-machine, the combination with stitch-forming devices, of a rotary take-up comprising a hub or disk and a take-up arm extending outward therefrom and on which arm the needle-thread moves in and out for the thread-slackening and the take-up or stitch-tightening operations, and a stationary guard-ring, attached to the face-plate of the machine, encircling said rotary take-up and overlapping the outer end of said take-up arm.

7. In a sewing-machine, the combination with stitch-forming devices, of a rotary take-up arm on which a loop or bight of needle-thread slides inward and outward for the thread-slackening and the stitch-tightening or take-up operations, and a stationary guard-ring overlapping the outer end of the said take-up arm, said guard-ring being attached at its lower part to the face-plate of the machine and having its upper part closely adjacent to said face-plate but with a thread-space between the adjacent parts.

8. In a sewing-machine, the combination with stitch-forming devices, of a rotary take-up comprising a hub or disk and a take-up arm extending outward therefrom, and a stationary hollow take-up ring or guard having two inwardly-extending flanges both overlapping the outer end of said take-up arm and between which flanges the said outer end of said arm travels, in rotating.

In testimony whereof we affix our signatures in presence of two witnesses.

PHILIP DIEHL.
MARTIN HEMLEB.

Witnesses:
HENRY CALVER,
HENRY J. MILLER.