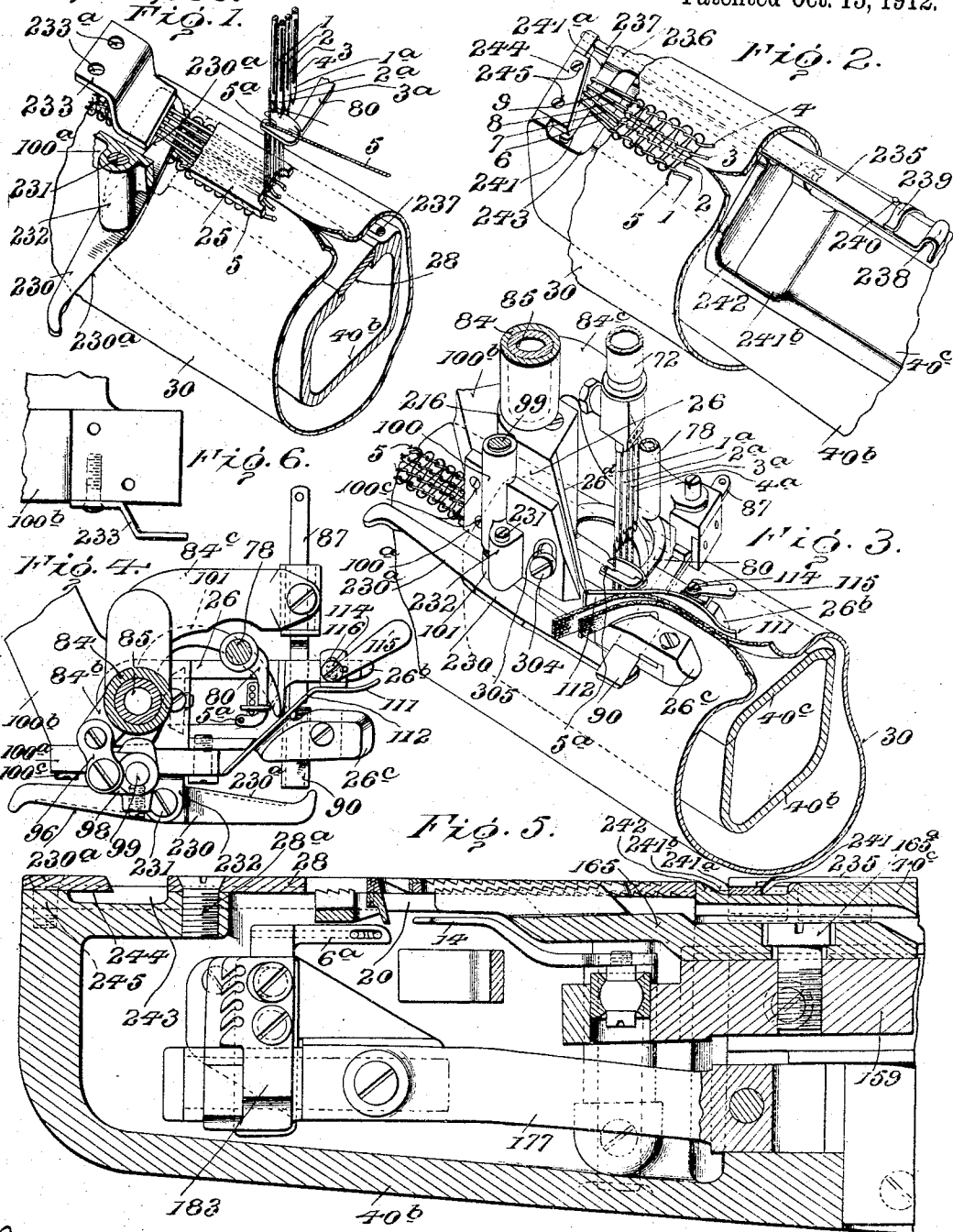


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SEWING MACHINE.

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1,041,586.

Patented Oct. 15, 1912.



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UNITED STATES PATENT OFFICE.

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SEWING-MACHINE.

1,041,586.

Specification of Letters Patent.

Patented Oct. 15, 1912.

Original application filed December 13, 1906, Serial No. 347,649. Divided and this application filed June 13, 1907, Serial No. 379,655. Renewed August 1, 1912. Serial No. 712,763.

To all whom it may concern:

Be it known that STOCKTON BORTON, deceased, late a citizen of the United States, and resident of the town of Warwick, county of Kent, State of Rhode Island, did invent new and useful Improvements in Sewing-Machines, fully set forth in the following specification.

The present invention relates to a sewing-machine especially designed to produce, by one operation and at high speed (meaning that each needle shall be capable of making approximately three thousand or more stitches per minute), a complete seam of special form for joining two abutting edges of cut-knit goods.

This is a division of his application for United States Letters-Patent filed Dec. 13, 1906, Sr. No. 347,649.

The present invention is particularly directed to improvements in thread-cutters, constituting permanent parts of the mechanism and operable to sever all of the threads connected to the work when the latter is removed from the machine.

In the drawings—Figure 1 is a perspective view of a part of a machine such as illustrated in his application for patent above mentioned, illustrating the operation of the upper thread-cutter when it is necessary to remove the work where the seam cannot be run off the outer edge of work; Fig. 2 is a perspective view of the end of the work-arm of the machine illustrating the operation of the lower thread-cutter when it is necessary to remove the work where the seam cannot be run off the outer edge of work; Fig. 3 is a perspective view of the machine, at the end of and above the work-arm, illustrating the mechanism operating at this point; Fig. 4 is a plan view (with parts in section) of the mechanism shown in Fig. 3; Fig. 5 is a vertical sectional view through the end of the hollow work-arm showing the mechanism operating within the same. Fig. 6 is a detail view showing part of an arm (100^b) of the frame of the machine with the fixed member of the upper thread-cutter secured thereto.

The sewing-machine to which the thread-cutters of his present invention are applied, is adapted to form, by a single operation, the seam constituting the subject-matter of his

United States Letters-Patent No. 883,614, dated March 31st, 1908; said seam is also illustrated and described in his above-mentioned patent application Sr. No. 347,649, filed December 13, 1906.

40^b is the end of a hollow work-arm of the machine, said arm terminating below overhanging parts of the stitch-forming and other mechanism, as shown in Fig. 3.

100^b, Figs. 3 and 4, is a rigid arm extending from the frame-work (not shown) of the machine.

85 is a vertically movable hollow presser-foot bar extending downward through hub 216 (Fig. 3) of presser-foot 26 and into a bearing in arm 100^b. Means not shown, rigidly secure the presser-foot to bar 85. The particular construction of the presser-foot forms no part of the present invention, and hence does not require explanation herein.

100^a is a plate secured to arm 100^b by two screws 100^c. A screw 304 on the presser-foot works in a slot 305 in plate 100^a and assists in guiding the presser-foot in its vertical movements. At its forward end the presser-foot is notched or bifurcated forming two toes 26^b and 26^c separated by a space in which the upturned edges of work to be trimmed advance to the trimmer blades 90 and 87, 90 being a fixed blade secured in toe 26^c of the presser-foot, and 87 being a movable blade.

111 is a work-guide and trimmings deflector, secured to toe 26^b by a screw 114 and adjusted to different positions by a lever 115.

84 is a sleeve or hollow shaft surrounding and rotatable about the hollow presser-foot bar 85 and terminating above the hub 216 of the presser-foot. A bent arm 84^a depends from the lower end of trimmer-sleeve 84 and has the movable trimmer blade 87 secured thereto. Through driving connections (not shown) to the upper end of trimmer-sleeve 84, the latter is oscillated about bar 85, swinging the arm 84^a and reciprocating blade 87.

Four needles, 1^a, 2^a, 3^a, and 4^a, are secured together to the lower end of the needle-bar, only a part of which is shown in Fig. 3.

80 is a cross-thread carrier secured to the lower end of a shaft 78 which depends from suitable bearings (not shown) in the frame-

work of the machine. Suitable driving connections (also not shown) oscillate said shaft and its thread carrier.

101 is a cross-thread-hook secured to the lower end of a short vertical shaft 99, journaled in a tubular bearing 100, which latter is cast integral with plate 100^a. 98 (Fig. 4) is a short crank-arm secured by a set-screw to the upper end of shaft 99, and connected by a link 96 to a crank arm 84^b on trimmer-sleeve 84. Through these connections oscillation of sleeve 84 oscillates shaft 99 and the cross-thread hook 101.

28, Figs. 1 and 5, is a throat-plate secured in an opening in the upper side of the end of the work-arm, by a screw 28^a (Fig. 5).

20 is the feed-surface, comprising rows of teeth adapted to work upward through slots in the throat-plate, and having a foot 165 through which a screw 165^a passes to secure the feed-surface to the end of a feed-lever 159, which lever is actuated by driving connections (not shown) to impart the desired movement to the feed-surface.

14 (Fig. 5) is a loop spreader adapted to be oscillated in a horizontal plane by its connection to the end of feed-lever 159.

6^a, Fig. 5, is one of a gang of four loopers arranged side by side on a looper-carrier 183 at the end of a looper-lever 177. Suitable driving connections (not shown) to the other end of the looper-lever, impart to the loopers suitable elliptical movement in a horizontal plane.

In the operation of the machine, the elements above described cooperate to trim the two upturned edges of a piece of fabric, such as 30, Fig. 3, and to then connect said trimmed edges by threads in such manner as to form the seam heretofore referred to. The upper or needle side of such seam is shown in Figs. 2 and 3, the cross-thread 5 being looped backward and forward beneath the stitches in the needle-threads.

The above description of the stitch-forming elements will facilitate an understanding of the thread-cutters which will now be described.

The provision of special means for cutting or clipping the threads is particularly desirable to facilitate removal of the work when it is not desirable to continue the seam to the outer edge of the work. To leave sufficient lengths of thread-ends through the four loopers, such as 6^a, the eye 5^a of thread-carrier 80 and the eyes of needles 1^a, 2^a, 3^a, 4^a, it is desirable that the thread-cutters shall operate to pull off sufficient thread and clip the threads at points to leave the desired length of thread-ends. In the drawings I have shown an upper thread cutter 230 and a lower thread-cutter. The latter consists of a bar 235 bent at one end to form a finger grip 238 (Fig. 2) and

at the other end having a right-angle blade 241 having a shearing edge 241^a and a sleeve 236 through which latter a horizontal rod 237 passes (Figs. 1 and 2). This thread-cutter bar 235 is longitudinally movable in a groove or depression in the top of cover 40° and is guided by said groove and by its engagement with rod 237 which constitutes a bearing on which this thread-cutter is mounted to turn and also move longitudinally. When not in use the blade takes the position shown in Fig. 5, and lies in a transverse recess or depression 241^b in cover 40°, being held in this position by a spring 239, Fig. 2, which bears against bar 235 along its inner edge, and thus tends to constantly hold the blade 241 in contact with the surface of the work-arm beneath said blade.

To sever the threads and remove work from beneath the presser-foot, the machine is stopped with the needles elevated. In the normal relation of the parts the teeth of the feed surface will under these conditions project above the throat-plate. Through connections which need not be here explained, the lifting of the presser-foot (by means not shown) will simultaneously lower the feed-surface below the surface of the throat-plate. Thereupon the operator by means of grip 238 pushes the thread-cutter forward, causing blade 241 to advance up an inclined surface 242 (Figs. 2 and 5) at the front end of recess 241^b and along the surface of the throat-plate beneath the work, gathering in front of it the threads extending downward from the work and pulling off lengths of the threads sufficient to form loops around the edge of blade 241. In Fig. 2, I have shown the blade 241 as thus pulling off loops in the four looper threads 6, 7, 8 and 9 only; but as the blade 241 will in its advance also encounter the four needle threads, each extending downward from the work in a loop around its corresponding looper and upward through the work to the eye of the needle, it follows that the blade will also pull off lengths of the needle-threads sufficient to form loops (illustration of which in the drawings would involve much confusion) around the edge thereof. When the blade 241 passes the end of the throat-plate, the pressure of the spring 239 (Fig. 2) causes it to drop into a transverse recess 243 (Figs. 2 and 5) in which position its further movement causes its cutting edge 241^a to act against the cutting edge of a blade 244 fixed by screws 245, thereby severing all of the threads which were gathered up by the blade 241, or in other words, all thread extending from the underside of the work. The ends of looper-threads 6, 7, 8 and 9 thus severed would extend upward from the loopers through the throat-plate and along the latter beneath the presser-foot. The thus severed ends of the needle-threads

1, 2, 3 and 4 would extend from the needle-eyes downward through the work and along the throat-plate beneath the presser-foot. Hence if this thread-cutter be alone relied upon to cut the needle-threads, withdrawal of the work will cause the ends of said threads to be drawn through the work.

For the purpose of cutting the needle-threads 1, 2, 3 and 4, and the cross-thread 5, above the work, when for example it is desired to terminate the seam and remove the work before the edge of the fabric or work is reached, a thread-cutter 230 is provided. It consists of a blade having cutting edges 230^a, 230^b (Fig. 4) secured to the lower end of a vertical stud 231 free to turn in sleeve or hub 232 which latter is a part of plate 100^a (Fig. 3). At the outer ends of its cutting edges this thread-cutter is slightly hooked, so that when the needles, presser-foot and other parts are raised, and the cutter swung around in front of the needle and cross-threads, as shown in Fig. 1, said threads are gathered in by the acting cutting edge and pulled back under the end of chaining-foot 25 and over the work, thereby forming loops of these threads around the cutting edge until the threads contact with the edge of blade 233 (Fig. 1), when the threads are sheared or cut off, leaving ends through the needles and cross-thread looper 80 of sufficient length to start the next seam. Blade 233 is fixed to the underside of the frame-arm 100^b (Fig. 3) by screws, as shown in Fig. 6, passing through the openings 233^a (Fig. 1). In Fig. 6, the plate 100^a, attached to arm 100^b, is omitted.

What I claim is:—

1. In a sewing machine, the combination with stitch-forming mechanism including one or more needles, of a work supporting-

arm having a free end at which said stitch-forming mechanism operates, a presser-foot and a throat-plate, and a thread-cutter mounted on a bearing on the work-arm and normally in a position clear of the space between the presser-foot and the throat-plate but movable on said bearing to traverse the space between the presser-foot and needle or needles (when elevated) and the throat-plate to sever thread extending from the work in the path of said thread-cutter.

2. In a sewing machine, the combination with stitch-forming mechanism including one or more needles, of a work-arm formed with a recess in its outer surface and a thread-cutter mounted on said work-arm and normally positioned in said recess but movable upward out of the recess and along the arm to sever thread connected to the work.

3. In a sewing machine, the combination with stitch-forming mechanism including one or more needles, of a work-arm formed with a recess in its upper surface, and a thread-cutter mounted on said work-arm and including a blade extending transversely across the upper surface of the work-arm and normally positioned in said recess but movable upward out of the recess and along the arm to sever thread connected to the work.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

CHRISTINA P. BORTON,
*Administratrix of the estate of Stockton
Borton, deceased.*

Witnesses:

HERBERT E. MATHEWSON,
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