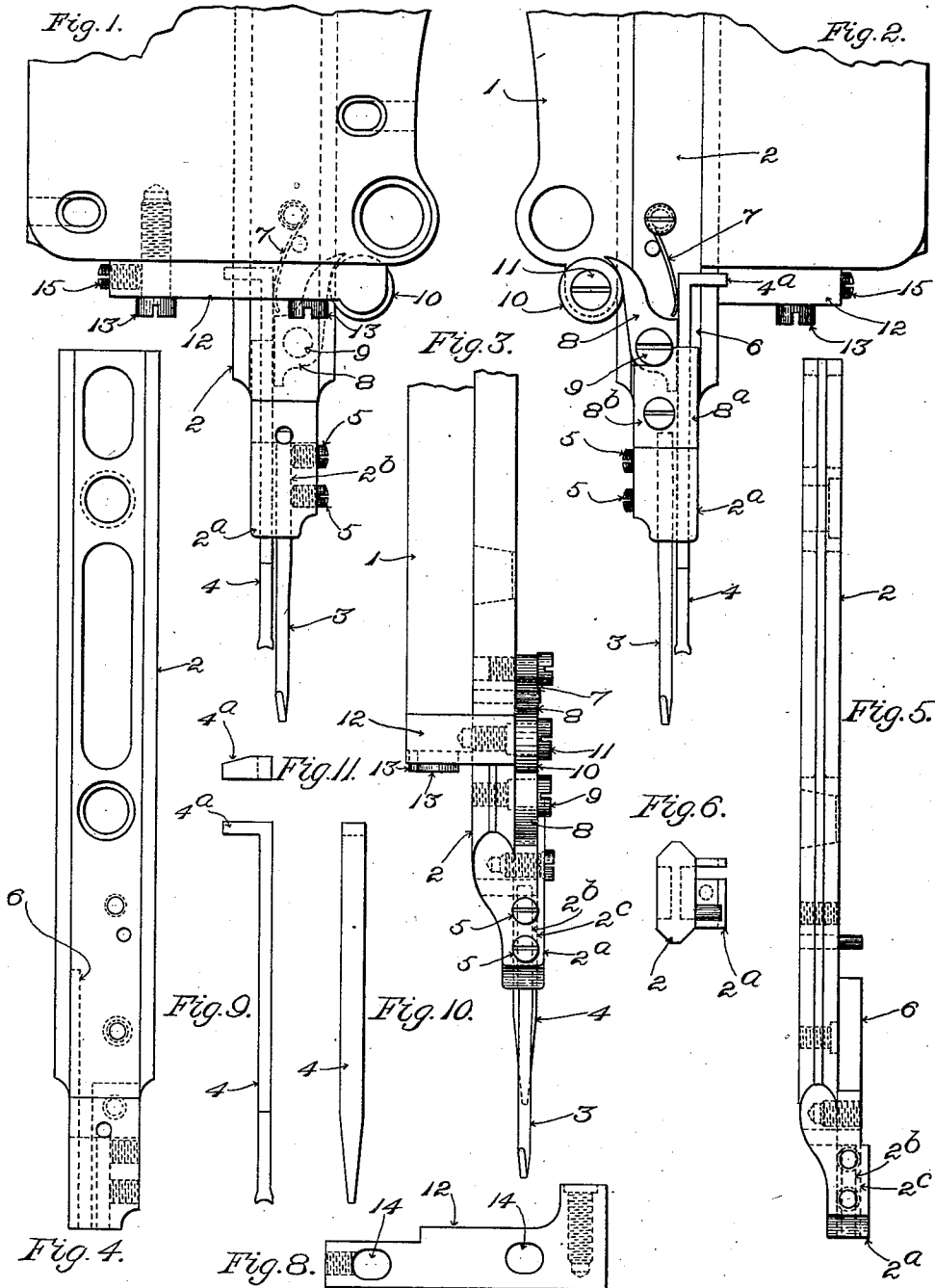


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 STITCH SEPARATING MECHANISM.
 APPLICATION FILED JUNE 29, 1908.

1,008,177.

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Witnesses:
 Oscar F. Hill. Fig. 7.
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UNITED STATES PATENT OFFICE.

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STITCH-SEPARATING MECHANISM.

1,008,177.

Specification of Letters Patent.

Patented Nov. 7, 1911.

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To all whom it may concern:

Be it known that I, FRANK W. MERRICK, a citizen of the United States, residing at Boston, in the county of Suffolk, State of Massachusetts, have invented a certain new and useful Improvement in Stitch-Separating Mechanisms, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention consists in stitch separating or indenting devices so contrived that the tool shall be controlled in its working stroke by the thickness of the material operated upon, and so that the acting end of the same shall be driven positively into such material a uniform distance below the surface regardless of variations in the said thickness or in the hardness of the material.

The invention may be variously embodied. In the embodiment which is shown in the drawings hereof the actuating devices are arranged to move the tool with yielding force until it encounters the upper surface of the material, the extent of this portion of the movement varying with the height of the portion of such surface which is thus encountered, and then the said devices act to drive the tool positively the predetermined distance into the work.

The invention is more particularly designed for application to a sewing machine to separate or indent stitches as they are produced, but is not in all cases restricted to use in a sewing machine.

In the drawings,—Figure 1 shows in front elevation a portion of the head of a sewing machine, with one form of the invention applied thereto. Fig. 2 is a back view of the parts of Fig. 1. Fig. 3 is an edge view thereof. Fig. 4 is a front elevation of the reciprocatory carrier-bar (awl-bar) shown separately. Fig. 5 is an edge view of the said carrier-bar. Fig. 6 is a top-view of the said carrier-bar. Fig. 7 is a front elevation of the roll-supporting block, shown separately. Fig. 8 is a plan view of the said block. Fig. 9 is a front elevation of the tool, shown separately. Fig. 10 is a view of the said tool looking from the right in Fig. 1. Fig. 11 is a top view of the said tool.

Having reference to the drawings,—1 is a portion of a sewing-machine head, and 2 is a reciprocatory bar mounted in guides therein and carrying one of the usual work-penetrating implements of the machine, in

this instance an awl 3. The said bar 2 is utilized for the actuation of the tool 4, as will be explained. To this end, the offset portion 2^a of the bar, at the lower end thereof, in which is formed the vertical socket 2^b for the shank of the awl (see, more particularly, Figs. 1, 2 and 3) has formed therein also a vertical passage 2^c which receives the stem of tool 4. The shank of the awl is held fast in socket 2^b by means of clamping screws 5, 5, occupying threaded holes which are tapped in one side of the said offset portion, the said screws engaging by their inner ends against the said shank. The stem of tool 4 is free to slide up and down within the passage 2^c, and is confined and guided by the walls of such passage. A lip 6 on the bar 2 extends upward in continuation of one side-wall of the said passage, and the upper end of the said stem is acted upon by the extremity of a spring 7 carried by the bar 2, such spring operating to hold the stem pressed against the said lip, as shown by Figs. 1 and 2. Thereby the tool is clamped with a moderate degree of force so that it shall retain its place, vertically, upon the carrier-bar as it moves up and down with the latter, until it encounters a resistance sufficient to overcome the friction due to the clamping action of the spring. Thus, in the rise of the carrier-bar the tool accompanies the same, keeping its position vertically thereon, until the bent upper end 4^a of the tool encounters a suitable stop, which may be constituted by the lower end of the head 1 of the machine. This encounter arrests the upward movement of the tool, while the bar 2 completes its rise. As the bar 2 descends, the tool descends therewith, keeping the place thereon which it occupied at the close of the rise, until the working end of the tool encounters the upper surface of the material being operated upon, by which the descent of the tool will be checked. This checking of the tool in its descent will occur earlier or later in the descent of carrier-bar 2, depending upon the thickness of the said material and the consequent height of its upper surface above the work-rest by which the material is supported for being operated upon. As the descent continues, the working end of the tool will be urged against the surface of the material by the yielding action of the frictional grip-device sliding along its stem,

until the tool is locked to the carrier-bar as will now be explained.

To drive the working end of the tool 4 (resting as just described against the surface of the work) positively into the work, I combine with the carrier-bar and the tool clutch-devices operating to lock the tool firmly to the carrier-bar at a predetermined point in the downward movement of the latter. These are represented by the clutch-lever 8, which is mounted pivotally upon the carrier-bar by means of a supporting screw 9, and the relatively stationary clutch-bar actuating cam 10, constituted by an anti-friction roll mounted upon head 1 by means of a supporting-screw 11, such roll occupying a position in which it is encountered by the projecting tail of the clutch-lever as the carrier-bar descends. When by such encounter the clutch-lever is turned upon its pivot so as to engage the stem of the tool, it locks the latter firmly to the carrier-bar, with the result that the tool is moved positively by the carrier-bar through the remainder of the down-stroke of the latter. 8^a, Fig. 2, is a covering and confining plate, attached to carrier-bar 2 by a screw 8^b, and serving to confine the tool and clutch-lever in place laterally.

To enable the depth of penetration of the working end of the tool into the material being operated upon to be varied when necessary, provision is made for causing the clutch-devices to close upon and lock the tool to the carrier-bar earlier or later in the descent of the latter, as may be required. In the present instance this adjustment is effected by mounting the anti-friction roll 10 upon a block 12 which is carried by the head 1. The block is secured to the under side of the lower end of the head by clamping screws 13, 13, the stems of which pass upward through holes 14, 14, Figs. 7 and 8, made through the block, and enter threaded holes, which are tapped upward into the head. The block is clamped in place by the flanges of the heads of such screws. For the purposes of the adjustment, the holes 14, 14, are elongated so that the block 12 and roll 10 may be shifted forwardly and rearwardly upon the head. For convenience and nicety in setting the roll, and to prevent the roll from shifting in consequence of the pressure of the tail of the clutch-lever against the same, a set-screw 15 is applied within a threaded hole that is tapped in the end of block 12 opposite roll 10, this set-screw taking bearing by its inner end against the stem of the adjacent clamping screw 13. The adjustability of roll 10 enables it to be set in or out with respect to the carrier-bar. As the outer surface of the tail of the clutch-lever 8 is cam-shaped and inclines upwardly and outwardly, it will be seen that by setting the roll in nearer to the carrier-bar the

clutch-lever will be closed earlier in the descending movement of the carrier-bar, while by setting it out farther therefrom the clutch-lever will be closed later in such movement.

In the case of devices heretofore proposed in which the tool is carried into the work with yielding action, as through the use of a spring, the depth of penetration varies with the hardness of the material operated upon, and as the material may be of different degrees of hardness in different portions thereof, it is obvious that the action of the tool, and the results, will vary from place to place. In the case of devices in which the tool is actuated positively in connection with material resting upon a fixed support, the working end of the tool will enter most deeply into the more elevated portions of the surface of the material where the latter is thickest.

What is claimed is:—

1. In stitch-separating mechanism, in combination, an indenting tool, which itself gages the thickness of the material operated upon, and means acting to drive the tool positively to a uniform depth into the material.

2. In stitch-separating mechanism, in combination, an indenting tool, and actuating means coöperating with said tool whereby the latter itself gages the thickness of the material operated upon, the said means including a clutch acting to cause the tool to be positively driven a predetermined distance below the surface of such material.

3. In stitch-separating mechanism in combination, a tool, means for moving it with yielding force into contact with the surface of the material operated upon, and means for positively driving it into the material to a uniform distance below the said surface regardless of variations in the thickness of the material.

4. In stitch-separating mechanism, in combination, an indenting tool, a yielding actuator by which the said tool is caused to take position against the surface of the material operated upon, and a positive actuator operating to drive the tool a uniform predetermined distance below the said surface regardless of variations in the height of the latter.

5. In stitch-separating mechanism, in combination, an indenting tool, a reciprocatory carrier, a yielding actuator operated by the said carrier and by which the tool is moved until it presses against the surface of the material operated upon, and a positive actuator operated by the carrier and by which the tool is driven a uniform predetermined distance below the said surface regardless of variations in the height of the latter.

6. In stitch-separating mechanism, in combination, an indenting tool, and actuat-

ing connections therefor comprising a yielding actuator by which the tool is moved until it presses against the surface of the material operated upon, and a clutch which engages to cause the tool to be then positively driven a predetermined distance below the said surface.

7. In stitch-separating mechanism, in combination, an indenting tool, and actuating connections therefor comprising yielding means by which the tool is moved until it presses against the surface of the material operated upon, a clutch, and a cam which operates such clutch to drive the tool positively a predetermined distance below the said surface.

8. In stitch-separating mechanism, in combination, an indenting tool, a carrier, a yielding actuator and a clutch both deriving movement through said carrier, the said yielding actuator serving to move the tool until it presses against the surface of the material operated upon, and a cam which operates said clutch to drive the tool positively a predetermined distance below the said surface.

9. In stitch-separating mechanism in combination, an indenting tool, a carrier, a yielding actuator and a clutch both deriving movement through said carrier, the said yielding actuator serving to move the tool

until it presses against the surface of the material operated upon, a cam which operates such clutch to drive the tool positively a predetermined distance below the said surface, and adjusting means by which said distance is varied.

10. In stitch-separating mechanism, in combination, an indenting tool, a carrier bar, means for causing the tool to accompany the carrier-bar with yielding force until the tool encounters the surface of the work, and clutch-devices which lock the tool firmly to the carrier-bar at a predetermined point in the movement of the latter.

11. In stitch-separating mechanism, in combination, an indenting tool, a carrier-bar, means for causing the tool to accompany the carrier-bar with yielding force until the tool encounters the surface of the work, clutch-devices which lock the tool firmly to the carrier-bar at a predetermined point in the movement of the latter, and means for adjusting the time in the stroke of the carrier-bar at which such clutch-devices lock the tool thereto.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK W. MERRICK.

Witnesses:

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JAMES B. BELL.