

(No Model.)

2 Sheets—Sheet 1.

W. S. MILLS.

WORK FEEDING ATTACHMENT FOR SEWING MACHINES.

No. 552,691.

Patented Jan. 7, 1896.

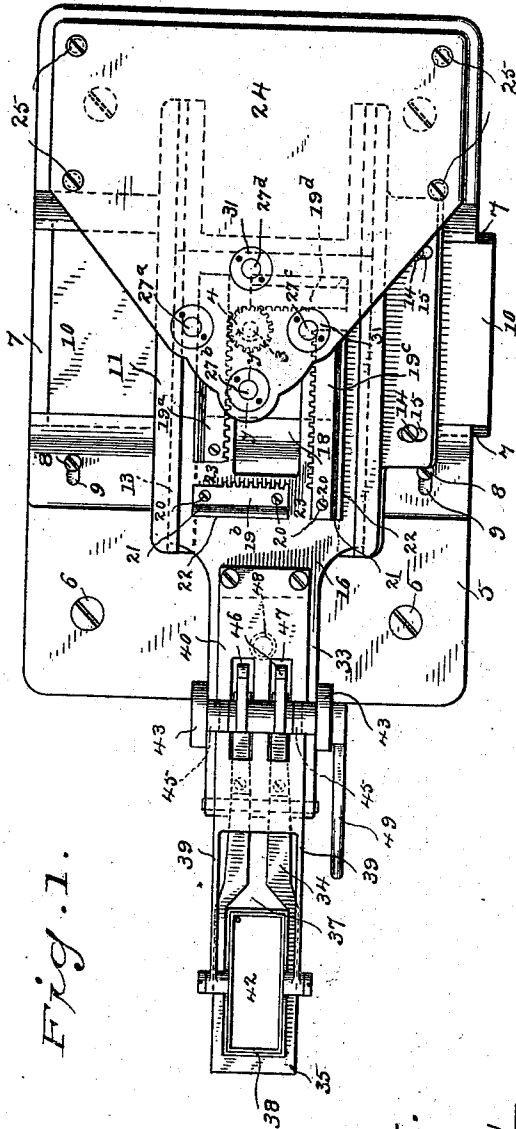


Fig. 1.

Fig. 5.

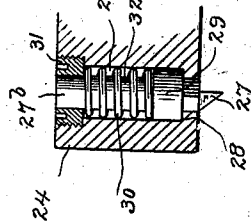
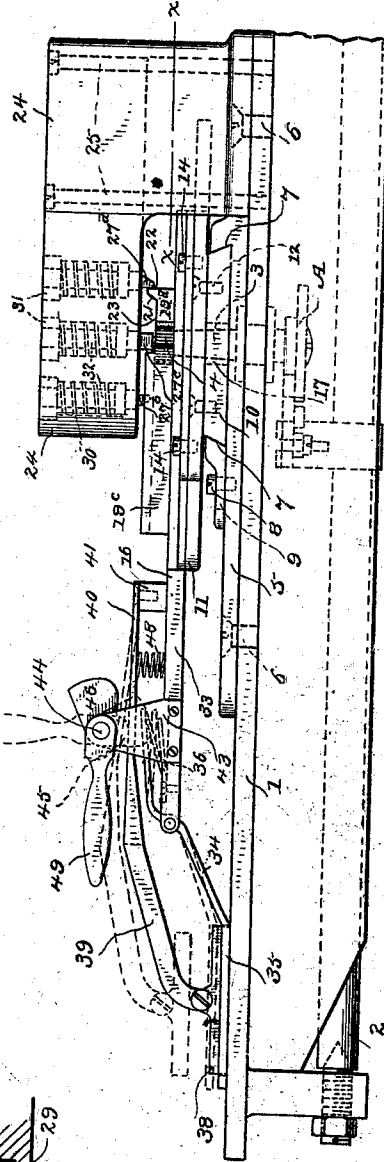


Fig. 2.



WITNESSES

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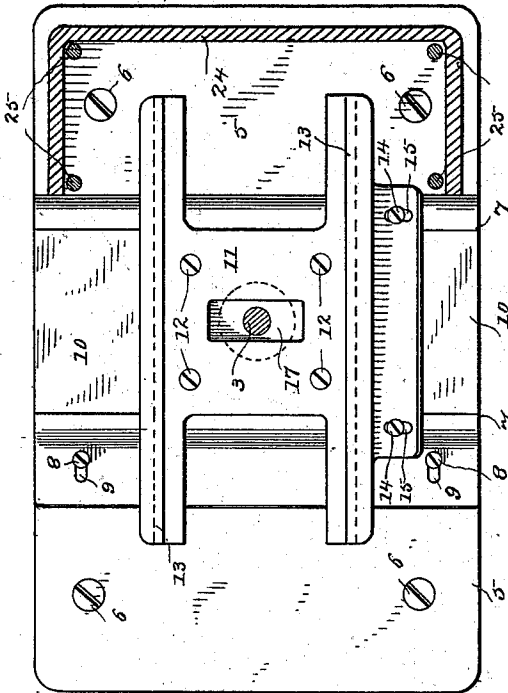


Fig. 1.

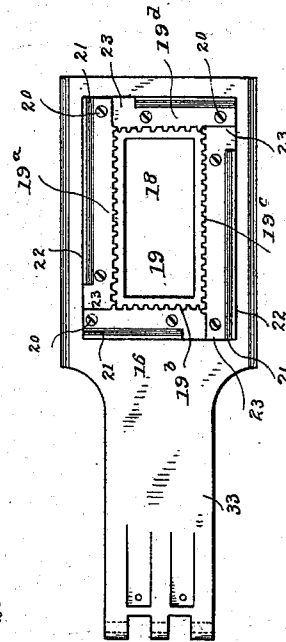


Fig. 3.

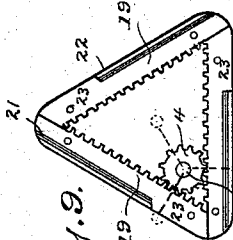


Fig. 5.

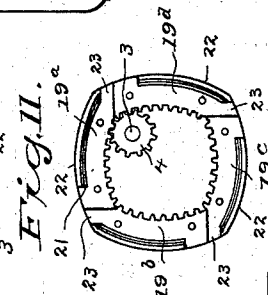


Fig. 7.

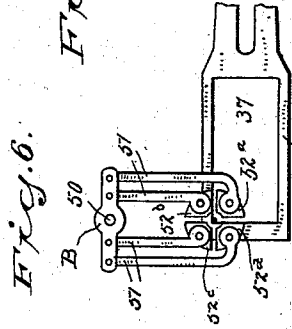


Fig. 9.

Fig. 10.

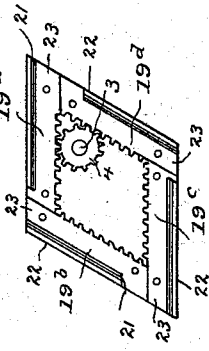
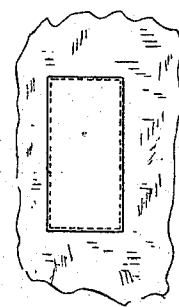


Fig. 12.



WITNESSES

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WORK-FEEDING ATTACHMENT FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 552,691, dated January 7, 1896.

Application filed March 6, 1895. Serial No. 540,720. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM S. MILLS, a citizen of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Work-Feeding Attachments for Stitching-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has for its object to provide a sewing-machine attachment especially adapted for stitching figures—as, for example, in shirt factories in stitching labels on shirts, and in manufacturing suspenders in the stitching on of the back and other pads which are usually secured to the webs by means of a line or lines of stitching corresponding to some predetermined figure.

My novel attachment enables me to stitch on a label or pad or to stitch any predetermined figure without turning the work on the cloth-plate, suitable mechanism being provided to move the work forward, backward and laterally, as may be required.

With these ends in view I have devised the novel attachment of which the following description, in connection with the accompanying drawings, is a specification, numbers and letters being used to designate the several parts.

Figure 1 is a plan view of my novel attachment as it appears in place, the cloth-plate of the sewing-machine being omitted; Fig. 2, a side elevation of my novel attachment complete, showing so much of a sewing-machine as is necessary to illustrate its operation; Fig. 3, a plan view of the attachment, the upper slide being removed and the cap-plate in section on the line *x x* in Fig. 2; Fig. 4, a plan view of the upper slide detached; Fig. 5, a detail sectional view on an enlarged scale on the line *y y* in Fig. 1, illustrating the construction and operation of one of the locking-catches; Fig. 6, a detail plan view illustrating the use of a special form of presser-foot in lieu of a supplemental clamp to hold the label or pad to be stitched in place; Fig. 7, a detail side elevation corresponding with Fig. 6; Fig. 8, a plan view showing a label stitched

in place; and Figs. 9, 10, and 11 are views illustrating different arrangements of racks upon the upper slide in order to stitch different figures.

1 denotes the cloth-plate of a sewing-machine, and 2 the usual rock-shaft under the cloth-plate. The usual feeding mechanism is dispensed with and in lieu of the usual feeding mechanism I employ pawl-and-ratchet mechanism, indicated as a whole by A, (see dotted lines in Fig. 2,) which acts in connection with the rock-shaft to impart intermittent—that is, a step by step—rotary movement to a vertical shaft 3, at the upper end of which is a pinion 4.

5 denotes the plate of the attachment which is secured to the cloth-plate in any suitable manner, as by screws 6. Plate 5 is provided with ways 7, one of which is made adjustable and is secured in place by screws 8 passing through slots 9 in the adjustable way.

10 denotes a slide adapted to reciprocate in ways 7 and which I shall term the “lower slide.”

11 denotes a plate which is secured to the lower slide in any suitable manner, as by screws 12, and which is provided with ways 13, one of which is made adjustable and is secured in place by screws 14, which pass through slots 15 in the adjustable way.

16 denotes the upper slide which is adapted to reciprocate in ways 13. The lower slide and plate 11 are provided with openings 17 and the upper slide is provided with openings 18 through which shaft 3 passes. The shape of these openings is of course not of the essence of my invention. They are made large enough to permit free movement of the upper and lower slides in stitching a figure.

19 denotes racks which are secured to the upper slide in any suitable manner, as by screws 20. Each rack is provided back of the teeth with an incline 21 and the back of the incline with a shoulder 22. At the forward end of each incline and shoulder is an opening 23 which permits the corresponding locking-catch to pass through, as will presently be fully explained.

24 denotes a cap-plate which is secured to plate 5 in any suitable manner, as by screws 25. This cap-plate is provided with sockets 26 in each of which is a locking-catch 27, the

lower end of which passes through the bottom of the cap-plate and is adapted to be raised by the inclines, then drop down back of the shoulders and then pass through openings 23, as will be more fully explained. The number of locking-catches used depends upon the number of racks used, a locking-catch being provided for each rack. In each of the sockets is a shoulder 28 which is engaged by an enlargement 29 to limit the downward movement of the catch, the latter being forced downward by a spring 30 which bears against the enlargement and against a nut 31, through which the shank 32 of the catch passes, as clearly illustrated in Fig. 5. The lower portion of the shank of each locking-catch is made angular to prevent it from turning in the cap-plate. The forward end of the upper slide consists of an extension 33, at the end of which is pivoted a lever or levers 34 which carry a work-clamp 35, the underside of which may be serrated if preferred in order to hold the work more firmly and prevent slippage. A spring or springs 36 (see dotted lines Fig. 2) bear against the rear ends of the levers and act to hold the work-clamp pressed down upon the cloth-plate of the machine. The forward end of the work-clamp is provided with an opening 37 which is made of just the size to receive the label, pad or other piece of work which it may be desired to stitch in place. In the form illustrated in Figs. 1 and 2 in addition to the work-clamp I use a supplemental clamp 38 which is pivoted to arms 39 extending forward and downward from a plate 40 which is secured to a block 41, itself secured to or formed integral with extension 33 of the upper slide. The supplemental clamp is adapted to pass into opening 37 in the work-clamp and is itself provided with an opening 42, near the edge of which the needle passes in use, as clearly indicated in Fig. 1, the label, pad or other article to be stitched in place being held in proper position on the work by the supplemental clamp, and the inner face of the clamp being beveled as shown so as to deflect the needle should it strike the clamp, which, however, is not likely to happen in use.

43 denotes standards extending upward from extension 33, in which is pivoted a shaft 44 carrying a cam 45, which is adapted to press the supplemental clamp down into position, and cams 46 which are adapted to pass through slots 47 in plate 40 and bear upon the rear end of lever or levers 34 to press the latter downward against the power of springs 36 when it is desired to raise the work-clamp. A spring 48 lying under plate 40 acts to raise the supplemental clamp when cam 45 is turned out of operative position.

49 is a hand-lever for oscillating shaft 44. It will be noticed from Fig. 2 that cams 45 and 46 act at right angles to each other. When hand-lever 49 is in the position shown in full lines in Fig. 2 cam 45 (shown only in dotted

lines) will act to press the supplemental clamp down upon the label or other piece to be stitched in place, and springs 36 will press the work-clamp down upon the work, and when hand-lever 49 is in the position shown in dotted lines in Fig. 2 cam 45 will be out of operative position and the supplemental clamp will be raised by spring 40, and cams 46 will act to press down the rear ends of levers 34 against the power of springs 36 and will raise the work-clamp, in which position the work with the label, pad or other piece stitched in place may be removed.

In the form illustrated in Figs. 1 and 2 no presser-foot is used and the work and label are held respectively by the work-clamp and supplemental clamp.

In the form illustrated in Figs. 6 and 7 the work-clamp is used the same as in the other form, but the supplemental clamp is dispensed with, and in lieu of the supplemental clamp I use a presser-foot B, which is attached directly to the presser-foot bar of the sewing-machine (not shown) by a screw (not shown) passing through a hole 50.

51 denotes spring-bars which extend forward from the presser-foot proper and carry at their forward ends blocks 52, which are rounded upon their under edges, as shown in Fig. 7.

In Figs. 9, 10 and 11 I have illustrated forms in which the racks may be arranged in order to stitch on labels or pads of different shapes or to stitch for any purpose whatever a figure of any predetermined outline.

The operation of the attachment is as follows: Suppose, for example, it is desired to stitch on a label or pad or to stitch a figure having the shape of the opening in the supplemental clamp in Fig. 1, the label stitched in place being shown in Fig. 8 and the arrangement of the racks in Figs. 1 and 4. The operator raises the work-clamp, places the work under it and lowers the work-clamp into operative position. The label, pad or other piece to be stitched on is then placed in opening 37 in the work-clamp and the supplemental clamp, if used, is lowered upon it. The machine may then be started. In case the supplemental clamp is not used a presser-foot B is used in lieu of the supplemental clamp. The presser-foot is simply lowered to place after the label or pad has been placed in opening 37 in the work-clamp, one of the blocks of the presser-foot lying at all times in the opening and holding the label or pad in place. Suppose that the supplemental clamp is being used and that the parts are in the position shown in Fig. 1 when the machine is started. It is obvious that as soon as pinion 4 begins to turn it will engage the rack specifically denoted by 19^a and will move the upper slide and with it the work-clamp and supplemental clamp toward the right, the pinion being retained in engagement with the rack by the engagement of the locking-catch specifically denoted by 27^a, with the shoulder upon

rack 19^a. As the movement of the upper slide toward the right proceeds and rack 19^a is about to pass out of engagement with the pinion, locking-catch 27^b will be raised by the incline of the rack denoted by 19^b and at the instant the pinion moves into engagement with the teeth of rack 19^b locking-catch 27^b will pass over the shoulder 22 of rack 19^b, thereby locking the pinion in engagement with that rack, and locking-catch 27^a will be in position to pass through the opening 23 between racks 19^a and 19^b as soon as the pinion begins to act on the latter rack. The action of the pinion on rack 19^b will be to stop the movement of the upper slide toward the right and to carry the upper slide and with it the lower slide straight forward. This movement continues until the pinion passes into engagement with the rack specifically denoted by 19^c, at which instant the locking-catch (denoted by 27^c) will be raised by the incline of rack 19^c and pass over the shoulder 22 on this rack. Locking-catch 27^b will now be in position to pass through the opening 23 between racks 19^b and 19^c. The action of the pinion upon rack 19^c will be to move the upper slide toward the left, the lower slide of course remaining stationary. As soon as this movement is completed the operations already described will be repeated and the pinion will pass into engagement with the rack specifically denoted by 19^d. The effect of the engagement of the pinion with rack 19^d will be to move the upper slide, and with it the lower slide, straight backward—*i. e.*, toward the front of the machine. This movement continues until the needle reaches the starting-place, and the circuit of the label, pad or figure is completed.

It will be obvious that the operation is practically the same whether four, three or any other number of racks within reasonable limits is used, or whether the racks are straight, or whether the racks are placed at right angles to each other, as in Figs. 1 and 4, or at other than right angles, as in Figs. 9 and 10, or whether the racks are curved, as in Fig. 11, the principle being the same in either case.

In Figs. 6 and 7 I have illustrated a form of presser-foot adapted for use in connection with the special form of work-clamp therein shown. It will be apparent from Fig. 6 that the block specifically denoted as 52^a will act to hold the label or pad in position in the opening 37 in the work-clamp when the presser-foot is lowered. From the position shown the movement of the upper slide and the work-clamp will be forward. As the movement proceeds the block specifically designated as 52^b will pass off from the work-clamp and will also act to hold the label or pad in place. An instant later block 52^a will pass up onto the work-clamp leaving the label or pad held in place by block 52^b. An instant later the movement of the upper slide and work-clamp toward the left will take place and the block specifically designated as

52^c will pass off from the work-clamp and onto the label or pad. At the end of this movement block 52^b will ride up on the work-clamp leaving the label or pad held in place by block 52^c. As the next forward movement proceeds block 52^d will pass from the work-clamp onto the label or pad and at the end of the movement block 52^c will pass onto the work-clamp. In using the presser-foot with racks arranged as in Fig. 9 three arms and three blocks would be required arranged to correspond with the arrangement of the racks. In using racks like those illustrated in Fig. 11 the presser-foot illustrated in Fig. 6 would be used. In using racks arranged as shown in Fig. 10 four arms and four blocks would be used, but the position of the blocks on the arms would be required to be shifted to correspond with the arrangement of the racks.

Having thus described my invention, I claim—

1. The combination with a work clamp and a reciprocating slide 16 by which said clamp is carried and which is provided with racks 19 having inclines 21 and shoulders 22, of a slide 10 which carries slide 16 and reciprocates at right angles thereto, an intermittently rotating pinion adapted to engage the racks in succession, and locking catches which are successively raised by the inclines and engage the shoulders to hold the pinion in engagement with the racks.

2. The combination with a work clamp and a reciprocating slide 16 by which said clamp is carried and which is provided with racks 19 having inclines 21 and shoulders 22, and openings 23 between said racks, of a slide 10 carrying slide 16 and reciprocating at right angles thereto, a pinion adapted to engage the racks in succession, and locking catches corresponding in number to the racks and adapted to be raised by each incline and engage the corresponding shoulder to hold the pinion in engagement with the rack, said locking catches passing through said opening after the pinion has passed into engagement with the next rack and been locked there by the next catch whereby the line of movement of the work clamp is changed to correspond with the line of the figure to be stitched.

3. The combination with slide 10 carrying a plate 11 provided with transverse ways, of a slide 16 adapted to slide in said ways and provided with a work clamp, racks on slide 16 provided with inclines 21 and shoulders 22, and openings 23 between said racks, a shaft passing through the openings in the slides and plate and carrying a pinion adapted to engage the racks successively and spring actuated locking catches adapted to be raised by the inclines and engage the shoulders to hold the pinions in engagement with each rack until the next rack is engaged at which instant the next locking catch will be raised by the incline and engage the next rack and the locking catch previously engaged will pass through the opening between the racks.

4. The combination with a clamp 35 adapted to bear upon the work and provided with an opening 37 adapted to receive a label, a slide 16 by which said clamp is carried and a slide 10 having ways in which slide 16 moves transversely to slide 10, of mechanism for reciprocating said slides and a presser foot consisting of spring arms carrying at their ends rounded blocks which successively bear upon the label to hold it in place in opening 37 and then ride up on the work clamp out of operative position.

5. The combination with a slide 16, a work clamp pivoted thereto, means for moving said work clamp into and out of operative position independently of the slide and racks 19

also carried by said slide and provided with inclines 21 and shoulders 22, of a slide 10 on which slide 16 reciprocates transversely, an intermittently rotating pinion adapted to engage the racks successively to move the slides, a cap plate and spring actuated locking catches carried by the cap plate one of which is adapted to engage each rack to retain the pinion in engagement therewith until the pinion passes into engagement with the next rack.

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

WILLIAM S. MILLS.

Witnesses:

A. M. WOOSTER,

S. V. RICHARDSON.