(No Model.)

E. M. PHELPS & R. W. THOMSON.

SEWING MACHINE FOR FINISHING BUTTONHOLES.

No. 473,178. Patented Apr. 19, 1892.

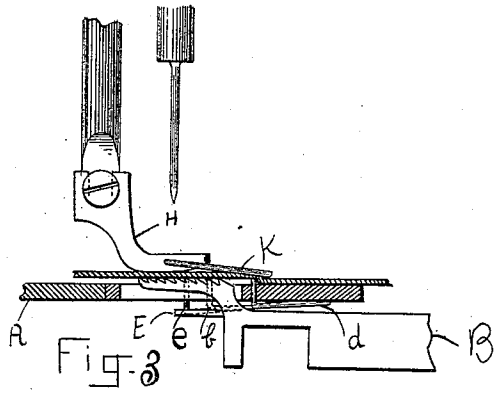

Fig. 3

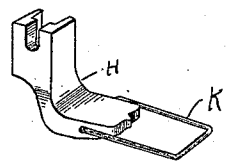

Fig. 4

Fig. 1

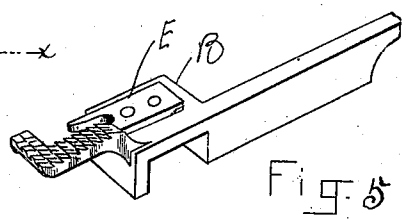

Fig. 5

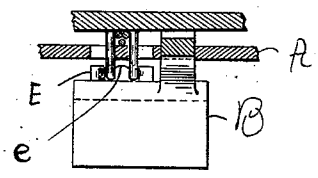

Fig. 2

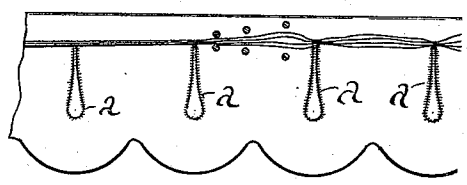

Fig. 6

WITNESSES:
F. A. McKernon
Geo. H. Williams

INVENTORS
Eugene M. Phelps
Robert W. Thomson,
By
C. B. Tuttle
Atty

UNITED STATES PATENT OFFICE.

EUGENE M. PHELPS AND ROBERT W. THOMSON, OF LYNN, MASSACHUSETTS, ASSIGNORS TO THE CONSOLIDATED BUTTON HOLE FINISHING MACHINE COMPANY, OF NASHUA, NEW HAMPSHIRE.

SEWING-MACHINE FOR FINISHING BUTTONHOLES.

SPECIFICATION forming part of Letters Patent No. 473,178, dated April 19, 1892.

Application filed February 17, 1887. Renewed March 2, 1892. Serial No. 423,558. (No model.)

To all whom it may concern:

Be it known that we, EUGENE M. PHELPS and ROBERT W. THOMSON, both of Lynn, in the county of Essex and Commonwealth of Massachusetts, have invented certain Improvements in Buttonhole-Finishing Machines, of which the following, taken in connection with the accompanying drawings, is a specification.

This invention relates to mechanism for finishing buttonholes; and the nature thereof is fully described and specifically claimed hereinafter.

Referring to the drawings, Figure 1 is a plan view of the needle-plate and shows in dotted lines the mechanism for gathering in the thrums. Fig. 2 is a sectional elevation of the mechanism, made through line *y y*. Fig. 3 is an elevation of a section through line *x x*. Both Figs. 2 and 3 also show certain parts of the machine not shown in Fig. 1. Said parts will be more specifically referred to hereinafter. Fig. 4 is a perspective view of the presser-foot detached. Fig. 5 is a similar view of the feed-foot detached, while Fig. 6 is a plan view of a piece of material and illustrates the work as being done with our mechanism.

It will be understood that when the buttonholes *a* have been formed in the cloth or leather, as shown in Fig. 6, when they leave the ordinary buttonhole-making machine the threads and piping-cord are loose and spreading, and these loose threads or cord are gathered together or "whipped over." This whipping over is now generally performed by hand; and it is the object of this invention to provide means for gathering these loose pieces together and whipping over rapidly by machine. To this end we take an ordinary two-needle sewing-machine, preferably the machine known in the trade as the "Singer over-seaming-machine". The mechanism of this machine is well known to persons skilled in the art of sewing-machine mechanisms, and only so much thereof as will illustrate the combination and use thereon of our present invention will be described herein or represented in the drawings annexed hereto. To this end we take the plate A, which is the ordinary base or needle-hole plate, of one of said two-needle machines, and to the under side of the plate we secure the wire loops *b d e*, the ends of which are suitably bent and extended upward through holes formed in the plate. Said loops are formed of spring-wire and are attached to the plate A in such manner as to drop downward their forward ends, thereby withdrawing their points into the holes in plate A, and directly under the loops is the feed-foot B. When this foot lifts upward to feed forward the material, it bears first upon and presses upward the loops *b d e*, extending the points of the wire up through the plate A, so that as the material moves forward the loose threads or thrums are gathered together and guided to a point directly between the points where the two descending needles will next pierce the fabric. When the feed-foot next descends, the loop-points withdraw into the plate and leave the face of the plate smooth to facilitate the hand manipulation of the material. It is necessary to gather the thrums closely together between the needles to make it certain that the needles will descend one on each side of the threads to be whipped over, and to this end the loop *e*, after being lifted upward, is pressed closely together, which operation is performed by a forked plate E, attached to the feed-foot B. The loop *e* is curved near its forward end at the points *f f*, as shown in Fig. 1. When the foots lifts upward, the fork E spans the loop in rear of said points *f f*, and as the foot moves forward the fork E engages with the wire at the points *f f* and compresses it, thereby moving the points of the wire closely together directly in front of the descending needles. By thus expanding the loop *e* and lifting it upward while expanded we insure taking in between the points all loose thrums that may have escaped the rearward loops, and also gather them closely into position by afterward contracting the loop, and thus carrying its points closely together. The holes in plate A which receive the ends of loop *e* are of course made oblong to allow the necessary movement of the points, as described. We would not be understood as saying that this described expansion and con-

traction of the loop *e* is necessary in all cases. We are cognizant from actual trial that the device would be practically useful and in many cases satisfactory even if the loops were all stationary; but we prefer to construct them as described above, as it enlarges the scope of the machine and insures more positive results. Neither should it be understood that we limit the number of loops to three, as shown, as a greater number and a lesser number would each be satisfactory in cases; but we have adopted three, as shown, as being most satisfactory in our experience.

We have described the loops as composed of spring-wire; but we are fully aware that other materials would be useful. It is, however, desirable to have the material yielding, so that in case one of the points should get engaged in the threads or in the material it would bend sufficiently to allow the material to escape forward with the feed-foot and not be injured. Bristles, therefore, could be used, as also many other obvious materials. Each loop has its points expanded slightly more than the next preceding one, as shown in Fig. 1, to insure the gathering in of all loose threads. Connected with the presser-foot H is a spring K, that presses down upon the material with a yielding pressure directly above the guide-points, and thus prevents the material from lifting upward sufficiently for the threads to slip over the points of the loops.

In an application filed by us on the 26th of April, 1887, Serial No. 236,220, we have shown and described a thrum-gathering device consisting of two separate points arranged in front of the needle, with means for separating the points from each other to engage the thrums and devices for bringing the points together to compress the cord and thrums, these points having movement in a horizontal plane, and we limit our claims in the present case accordingly.

We claim—

1. In combination with the stitch-forming and feeding mechanism of a sewing-machine and with the needle-hole plate, a pair of vertically-operating thread-gathering levers suitably supported beneath the needle-hole plate and projecting upwardly through openings therein, one upon each side of the line of the bar-cord, forming a channel for the cord and thrum ends, and operating mechanism for said levers, whereby the thrum ends may be gathered to the bar-cord and all bound together, substantially as described.

2. In combination with the stitch-forming and feeding mechanism of a sewing-machine and its needle-hole plate, openings in said plate upon each side of the line of the bar-cord, a series of vertically-operating thread-gathering levers pivoted beneath the needle-hole plate and having upturned ends, forming a converging channel, and operating means for moving said levers to cause the ends thereof to pass through said openings to the upper surface of the plate for gathering the thrum ends and bar-cord together, substantially as described.

3. In combination with the stitch-forming mechanism of a sewing-machine and its needle-hole plate, two or more vertically-operating thread-gathering spring-levers pivoted beneath the needle-hole plate and having upturned ends, openings in said plate on each side of the line of the bar-cord for the ends of the levers, and a forked piece E, attached to the feed-bar, for operating said levers, substantially as described.

4. In combination with the stitch forming and feeding mechanism of a sewing-machine, a device for gathering and guiding loose threads, having a pair of upwardly-projecting points, the throat-plate A, having enlarged openings therein to allow for the passage of and lateral movement of said points, means for lifting said points, and means, substantially as described, for contracting the points directly in front of the needle-hole, substantially as described.

5. In combination with stitch-forming mechanism of a sewing-machine, a device for gathering and guiding loose threads, consisting of the loops *b d*, having upwardly-projecting and yielding points, the plate A, having openings for the passage of the same on each side of line of the bar-cord, and a loop *e*, the said loop having also upwardly-projecting points and having the laterally-bent portions *f f*, as described, the feed-bar, and fork E, substantially as described.

EUGENE M. PHELPS.
ROBERT W. THOMSON.

Witnesses:
GEO. H. WILLIAMS,
C. B. TUTTLE.