

(No Model.)

5 Sheets—Sheet 2.

E. J. SWARTOUT.

MACHINE FOR SEWING HAT TIPS.

No. 316,414.

Patented Apr. 21, 1885.

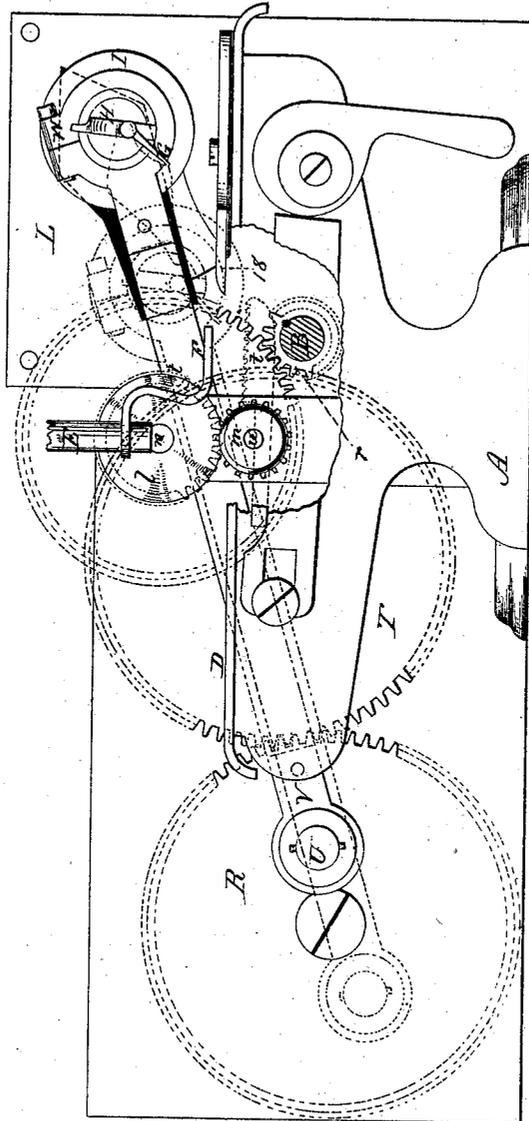


Fig. 2

Witnesses
Jos. C. Park
L. C. Jockey.

Emma J. Swartout
Inventor
By Atty
J. M. Cole.

(No Model.)

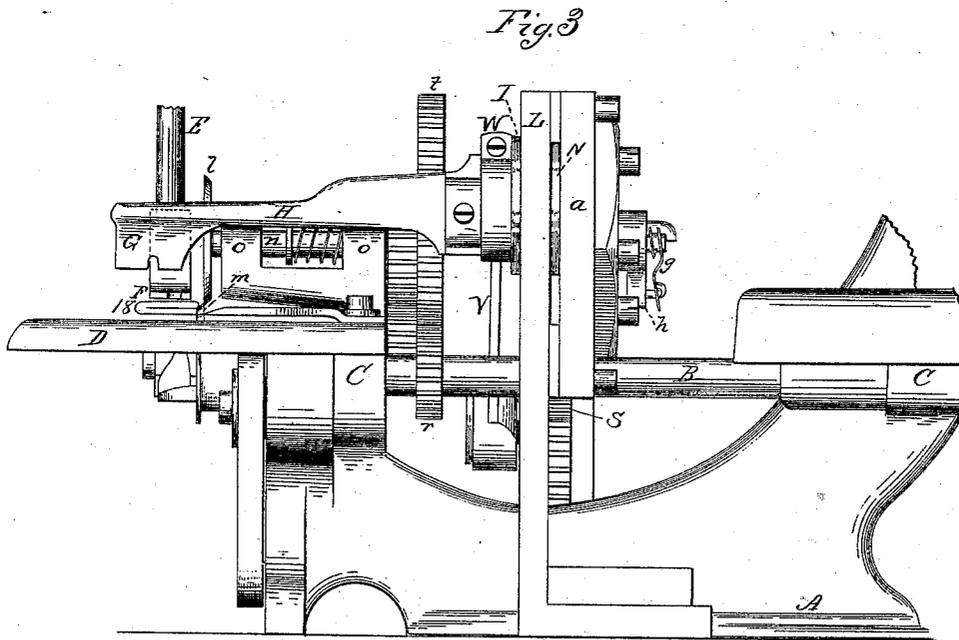
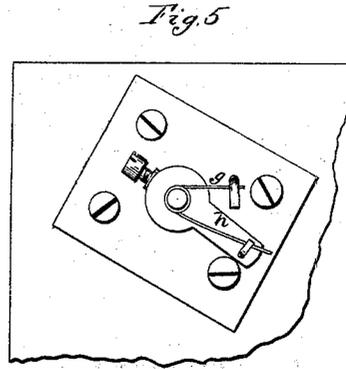
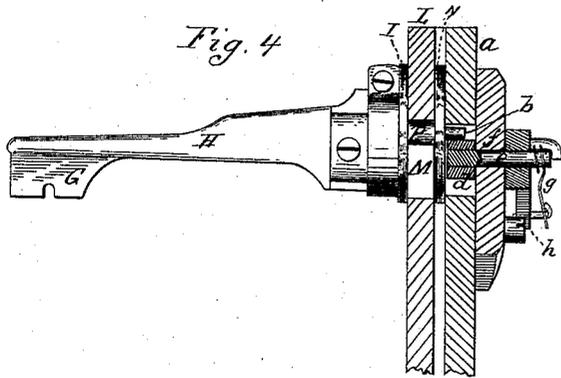
5 Sheets—Sheet 3.

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Witnesses
Jos. C. Carle
L. B. Tucker

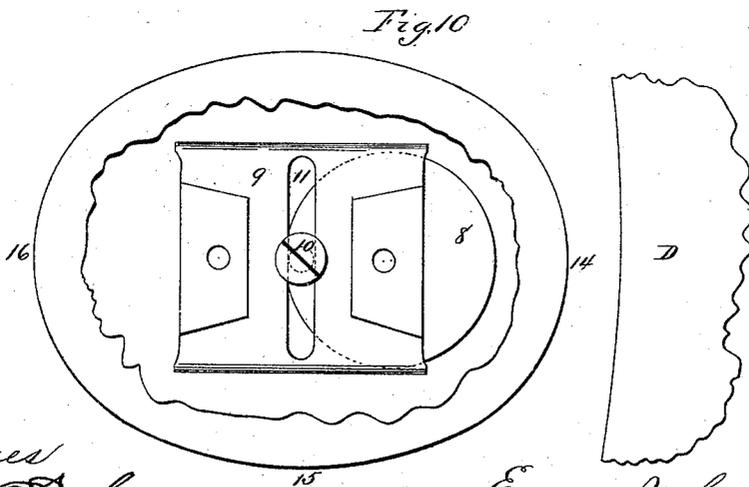
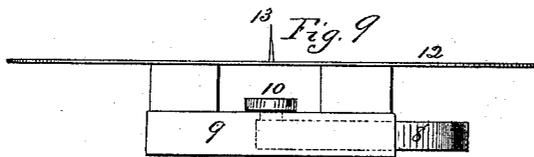
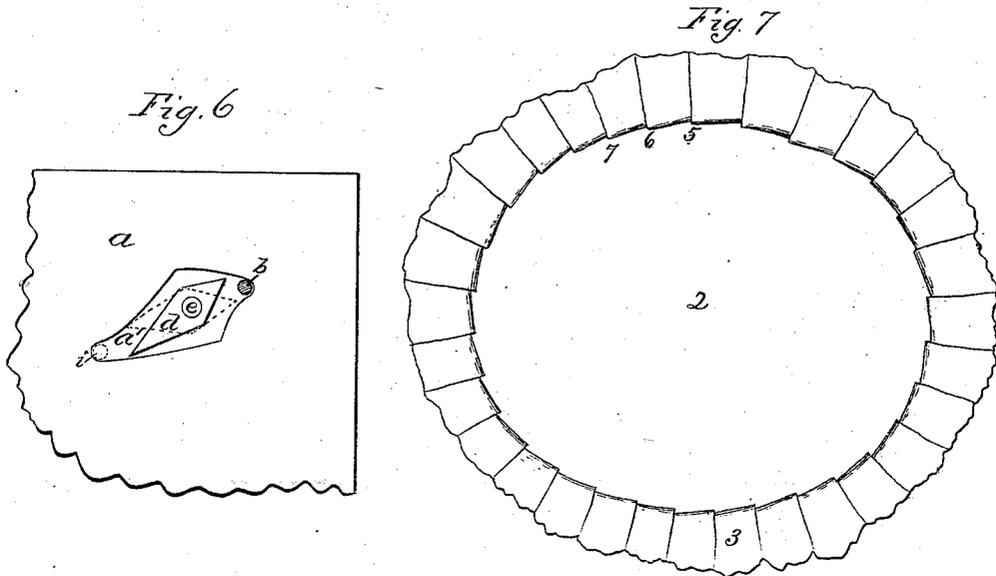
Emma J. Swartout
 Inventor
 By Atty
Wm. C. Miles

E. J. SWARTOUT.

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Witnesses
Jos. C. Carle
L. E. Crocker

Emma J. Swartout
 Inventor
 By Atty
Jos. C. Carle

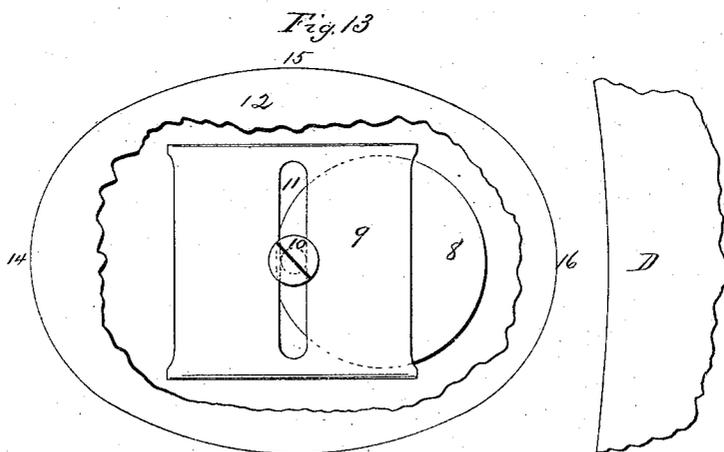
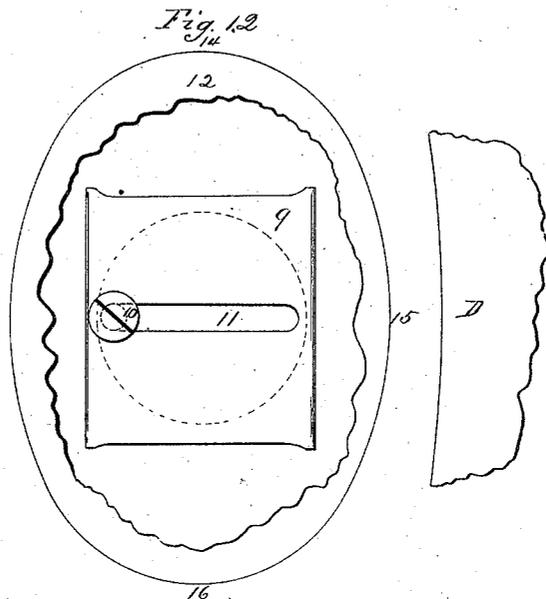
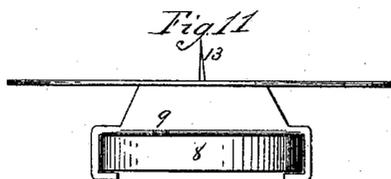
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5 Sheets—Sheet 5.

E. J. SWARTOUT.
MACHINE FOR SEWING HAT TIPS.

No. 316,414.

Patented Apr. 21, 1885.



Witnesses
Jos C. Carl
L. B. Crocker

Emma J. Swartout
 Inventor
 By Atty
Jos C. Carl

UNITED STATES PATENT OFFICE.

EMMA J. SWARTOUT, OF DANBURY, CONNECTICUT.

MACHINE FOR SEWING HAT-TIPS.

SPECIFICATION forming part of Letters Patent No. 316,414, dated April 21, 1885.

Application filed September 5, 1884. (No model.)

To all whom it may concern:

Be it known that I, EMMA J. SWARTOUT, of Danbury, in the county of Fairfield and State of Connecticut, have invented a new Improvement in Machines for Sewing Hat-Tips; and I do hereby declare the following, when taken in connection with accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a top view, parts of the sewing-machine broken away to show the invention; Fig. 2, an end view, portions broken away; Fig. 3, a front side view; Fig. 4, a vertical section of the guide-plate L *a*, showing the arrangement of the plaiting-blade slide; Fig. 5, a back view of the plate *a*, showing the application of the spring to the tongue *d*; Fig. 6, a face view of the plate *a*, showing the opening in which the stud *b* on the slide works; Fig. 7, a face view of the tip, illustrating the manner of applying the side lining thereto; Fig. 8, a section through the same; Fig. 9, a side view of the holder; Fig. 10, a top view of the same, showing the relation of the holder to the work-plate; Fig. 11, an end view of the holder; Figs. 12 and 13, diagrams, which, together with the elliptical line in Fig. 10, illustrate the operation of the elliptical working holder.

This invention relates to the construction of a machine for performing that part of the work in the manufacture of hats commonly called "sewing hat-tips"—that is to say, the lining for hats. The tip or lining for the top of the hat is of considerably less diameter than the crown of the hat. The lining for the sides of the crown at its lower edge must be substantially that of the crown of the hat below the upper edge of the "sweat," and this side lining, in order to be properly stitched to the tip, requires to be contracted more or less at its junction with the tip in order to bring that edge to the diameter of the tip. The satin (the material with which the hat is usually lined) is best contracted by laying plaits in the edge during the process of sewing the side lining to the tip, as indicated in Figs. 7 and 8.

The object of my invention is the construc-

tion of a machine which will plait the side lining, stitch it to the tip in the proper elliptical line to conform to the shape of the hat, and also cut off the surplus material from the outer edge of the tip and side lining.

To that end my invention consists, principally, in combining with a sewing-machine a guide which will hold the tip in proper relation to the needle and carry it in the required elliptical path, combined with a plaiting-blade in front of the needle having a reciprocating movement downward toward the needle at intervals of several stitches, and these elements also combined with an automatic cutting device behind the needle, arranged to cut away the surplus material outside the seam, as more fully hereinafter described.

In illustrating my invention I show it as applied to the sewing-machine commonly known as the "Willecox & Gibbs" machine; but I show only so much of that machine as is necessary for the illustration of the invention, the machine itself being too well known to require detailed description or full illustration, my invention being applicable to many other sewing-machines.

A represents the base of the sewing-machine; B, the driving-shaft, arranged in bearings C, as in the usual construction of this machine, the shaft carrying the looper in the usual manner.

D is the work-plate, its outer end cut away, the purpose of which will hereinafter appear; E, the presser-foot spindle, carrying the presser-foot F; G, the plaiting-blade, which is formed upon the end of an arm, H. This arm is made fast to a slide arranged in a vertical guide, L, as seen in Fig. 4. This vertical guide L is a thin vertical plate made fast to the bed of the machine, and through it is an opening, M. (See Fig. 4, and in broken lines Fig. 2.) The slide consists of two disks, I N, one upon each side of the plate L, the two connected through the opening M by a hub, P. The two disks, working upon the respective sides of the plate, maintain a vertical position, but are movable freely on the surface of the plate. The arm H extends from the slide parallel with the axis of the slide—that is, at right angles to the vertical guide L.

A reciprocating movement is imparted to

the plaiting-blade G from a crank-wheel, R, here represented as arranged upon the side of the driving-shaft opposite to that of the blade G. This crank-wheel is caused to rotate by means of a pinion, S, on the driving-shaft B, working into a gear, T, and the gear T into corresponding teeth on the crank-wheel R.

From the crank-pin U on the crank-wheel a connecting-rod, V, extends to the slide I N, and is rigidly connected to it, here represented as by a clamp, W, and so that as the crank-wheel R revolves the slide will receive a reciprocating movement toward and from the needle to the extent of the throw of the crank-pin U; but this reciprocating movement is so slow, owing to the train of gearing to the crank-wheel, that such complete reciprocating movement occupies the time of several revolutions of the driving-shaft—that is, during the taking of several stitches.

At the extreme retreating movement of the blade G it stands considerably above the work-plate, as seen in Fig. 2; but that it may approach the work-plate as it advances, the forward movement of the plaiting-blade is descending, but after having made its forward movement it is desirable that the blade should rise immediately as it commences its retreat. The path of movement of the plaiting-blade is indicated in broken lines, Fig. 2. To produce this peculiar movement, a guide is provided, by which the movement of the slide carrying the blade is governed.

Upon the back of the plate L a second plate, *a*, is applied and parallel therewith. In this plate *a* an opening, *a'*, is formed, as seen in Fig. 6, the outline of which corresponds to the required path of movement of the plaiting-blade.

From the slide and concentric with the axis thereof a stud, *b*, extends into this opening, as seen in Fig. 4. In this opening a tongue, *d*, is hung upon a pivot, *e*, arranged in a bearing, *f*, and upon which the tongue may turn from one extreme position to the other, as indicated in broken lines, Fig. 6; but the forward end of the tongue is held down upon the bottom of the opening in the plate *a* by means of a spring, *g*, arranged to bear upon a lever, *h*, made fast to the pivot *e* of the tongue, as seen in Figs. 4 and 5.

The operation of this tongue is as follows: Suppose the stud *b* on the blade-slide stands in its extreme rear position, as indicated in Fig. 6. As it advances it must pass below the rear end of the tongue, because the space below is of sufficient width to permit the stud to enter, while the space above is too narrow for it to enter. Guided, therefore, by the tongue, the stud descends and follows the line of the bottom of the opening until it reaches its extreme forward movement, as at *i*. In this forward or advance movement of the stud it passes beneath the tongue and raises the forward end of the tongue, as indicated in broken lines, so as to permit the stud *b* to pass beyond the tongue and the tongue to escape therefrom,

so that it may return to its down position. Then as the stud returns it strikes the upper side of the tongue, and is guided thereby upward and until it reaches the opposite end of the tongue, where, continuing its rear movement, it depresses that end of the tongue, as indicated in broken lines, until the stud passes over the end, to permit the tongue to escape and return to guide the stud downward in its next advance. This movement of the stud, being imparted to the slide, and thence to the blade, causes the movement of the blade to be downward and toward the work-plate and needle in its advance, and on its retreat upward and away from the work-plate and needle. This movement of the blade is necessary in order to take it away from the fabric being stitched, and then bring it down in time to take up the requisite quantity of material to form the plait.

The cutting or trimming device consists of a pair of revolving cutters, *l* and *m*. The cutter *l* is arranged upon a shaft, *n*, at right angles to the line of feed of the machine and in bearings *o*. To the shaft *n* and its cutter rotation is imparted by a pinion, *r*, on the driving-shaft, working into a gear, *t*, on the shaft *n*. The under cutter, *m*, is arranged on a shaft, *u*, parallel with the shaft *n*, the two shafts geared together to cause them to revolve in opposite directions, the two edges of the cutters standing together, as seen in Fig. 3, and distant from the line of stitches to be made according to the amount of material required to be left outside the stitches.

The operation of the machine is as follows: The tip 2, Figs. 7 and 8, may be first cut in the required elliptical shape, as before stated, considerably smaller than the crown of the hat. The strip 3, which is to form the lining of the side of the crown, is cut of the required width, and its lower edge doubled, as at 4. The doubled edge is laid upon the tip near its edge, and that point—say 5, Fig. 7—placed beneath the presser-foot for the needle to enter. The work commences with the plaiting-blade at its extreme rear position. The operator holds the two parts of the work in their proper relative position, the machine is set in operation, and the stitching commences. At the same time the blade G begins its descent and advance, and strikes the side lining, 3, at a point distant from the commencing-point 5, and, continuing its advance, lays a plait, 6, in the side lining and carries it beneath the presser-foot to the needle to be stitched, as indicated in broken lines, Fig. 2. Then the retreat of the blade commences, it immediately rising from the fabric in such retreat, as before described. Reaching its extreme rear movement it again advances, as before, and lays the next plait, 7, (see Fig. 7,) and so continuing will intermittently lay the plaits in the edge of the side lining and present those plaits to the needle to be stitched.

In thus describing the operation of the machine I have presumed the tip to be cut to the proper shape, and so that its edge may be

guided in the usual manner of guiding work upon a sewing-machine; but while the machine is adapted to so stitching the tip, I prefer to make the guiding operation automatic.

5 To this end I provide a holder upon which the tip may be held and presented to the needle to run the elliptical line of stitches. Various holders which will thus support and carry the tip are known. I illustrate one such holder in
10 Figs. 9, 10, and 11. This consists of a stationary circular disk, 8, upon which is a carriage, 9. Eccentrically on the disk 8 is a stud, 10, and in the carriage 9 is a transverse slot, 11, corresponding in width to the stud 10. On the carriage 9 is a holder, 12, upon which the tip is made fast by any suitable clamping device. The holder is provided with a center-pin, 13, corresponding to the center of the tip, as a means for properly locating the tip thereon.
20 The sides of the carriage 9 necessarily follow the circumference of the disk 8. At the same time the transverse slot 11, working upon the stationary eccentric stud 10, imparts a longitudinal movement to the carriage, giving to any single
25 point on the carriage an elliptical path. To illustrate: Suppose the point 14 to be the starting-point where the needle first begins its work, and the elliptical line indicating the path in which the line of stitches is to be run. As
30 the carriage revolves, the slot 11, working upon the stud 10, causes the carriage to move inward or toward the center of the disk during one-fourth of its movement, or to the position seen in Fig. 12. At this time the center 13 has approached the needle, and brought the point 15
35 on the shorter diameter to the needle, the path from 14 to 15 gradually approaching the needle in elliptical line. Continuing the rotation of the carriage, another fourth will bring the center
40 13 again over the center of the stud 10, and the opposite point, 16, on the longer diameter will then have come to the needle, as indicated in Fig. 13, and so continuing through the entire
45 revolution the tip will be presented to the needle, so that an elliptical line of stitches will be run entirely around it. The holder is arranged in relation to the work-plate so that the tip thereon will readily pass between the
50 presser-foot and the work-plate, the work-plate cut away to allow the rotation of the holder. The tip is cut of sufficient size to form the ellipse, but without any special regard to its ultimate shape further than the consideration of unnecessary waste of material, and as
55 the lining is stitched to the tip the rotation of the tip carries it between the cutters *lm*, which operate upon the tip and the projecting portion of the side lining and cut therefrom the surplus material, bringing the tip to the
60 required elliptical shape.

In some cases a welt, 17, is required to be introduced between the side lining and the tip to give to the work a more finished appearance. This welt consists of a strip of fabric
65 doubled. To double and present this strip, I apply a folding-guide, 18, to the work-plate, through which the welt is run and presented

between the tip and the edge of the side lining, and so that the line of stitches runs through the side lining, welt, and tip, as indicated in
70 Fig. 8.

While I prefer to impart the down and forward movement to the plaiting-blade and the up and retreating movement by means of the guide and crank, as described, I wish to be understood as including in such description any
75 substantial equivalent for producing this movement of the plaiting-blade.

I claim—

1. The combination of a stitching mechanism, the slide I N, carrying the plaiting-blade, said slide arranged in a guide parallel with the axis of the needle, the said slide provided with a stud, *b*, plate provided with the opening *a'*, corresponding in shape to the path of
80 movement required for the plaiting-blade, and in which said stud *b* will work, the tongue *d* hung in said opening, substantially as and for the purpose described.

2. The combination of a stitching mechanism, a plaiting-blade adapted to receive reciprocating movement in a path down and forward in its advance, up and rearward in its retreat, mechanism, substantially such as described, to impart such reciprocating movement to said blade, the advancing movement
85 occurring at intervals of several stitches, and a pair of revolving cutters, substantially as described.

3. The combination of a stitching mechanism, a plaiting-blade arranged upon a slide in guides parallel with the axis of the needle, a crank, and rod connecting said crank with said slide, substantially as described, and whereby the reciprocating movement imparted
90 to the blade is downward and forward in advance, and upward and rearward in retreat, and a pair of revolving cutters, substantially as specified.

4. The combination of a stitching mechanism, the slide I N, carrying the plaiting-blade, said slide arranged in a guide parallel with the axis of the needle, the said slide provided with a stud, *b*, plate provided with the opening *a'*, corresponding in shape to the path of
95 movement required for the plaiting-blade, and in which said stud *b* will work, the tongue *d*, hung in said opening, and a pair of revolving cutters, substantially as described.

5. The combination of a stitching mechanism, a plaiting-blade adapted to receive reciprocating movement in a path down and forward in its advance, up and rearward in its retreat, mechanism, substantially such as described, to impart such reciprocating movement to said blade, the advancing movement
100 occurring at intervals of several stitches, and a holder arranged in a plane parallel with the work-plate and movable in an elliptical path, substantially as described.

6. The combination of a stitching mechanism, a plaiting-blade arranged upon a slide in guides parallel with the axis of the needle, a crank, and rod connecting said crank with
105

said slide, substantially as described, and whereby the reciprocating movement imparted to the blade is downward and forward in advance, and upward and rearward in retreat, and a holder arranged in a plane parallel with the work-plate and movable in an elliptical path, substantially as specified.

7. The combination of a stitching mechanism, the slide I N, carrying the plaiting-blade, said slide arranged in a guide parallel with the axis of the needle, the said slide provided with a stud, *b*, plate provided with the opening *a'*, corresponding in shape to the path of movement required for the plaiting-blade, and in which said stud *b* will work, the tongue *d*, hung in said opening, and a holder arranged in a plane parallel with the work-plate and movable in an elliptical path, substantially as described.

8. The combination of a stitching mechanism, a plaiting-blade adapted to receive reciprocating movement in a path down and forward in its advance, up and rearward in its retreat, mechanism, substantially such as described, to impart such reciprocating movement to said blade, the advancing movement occurring at intervals of several stitches, and a pair of revolving cutters, with a holder arranged in a plane parallel with the work-plate and movable in an elliptical path, substantially as described.

9. The combination of a stitching mechanism, a plaiting-blade arranged upon a slide in guides parallel with the axis of the needle, a crank, and rod connecting said crank with said slide, substantially as described, and whereby the reciprocating movement imparted to the blade is downward and forward in advance, and upward and rearward in retreat, and a pair of revolving cutters, with a holder arranged in a plane parallel with the work-plate and movable in an elliptical path, substantially as specified.

10. The combination of a stitching mechanism, the slide I N, carrying the plaiting-blade, said slide arranged in a guide parallel with the axis of the needle, the said slide provided with a stud, *b*, plate provided with the opening *a'*, corresponding in shape to the path of movement required for the plaiting-blade, and in which said stud *b* will work, the tongue *d*, hung in said opening, and a pair of revolving cutters, with a holder arranged in a plane parallel with the work-plate and movable in an elliptical path, substantially as described.

11. The combination of a stitching mechanism, a plaiting-blade arranged upon a slide in guides parallel with the axis of the needle, a crank, and rod connecting said crank with said slide, substantially as described, and whereby the reciprocating movement imparted to the blade is downward and forward in advance, and upward and rearward in retreat, and the welt-folder arranged between the work-plate and plaiting-blade, substantially as described.

12. The combination of a stitching mech-

anism, the slide I N, carrying the plaiting-blade, said slide arranged in a guide parallel with the axis of the needle, the said slide provided with a stud, *b*, plate provided with the opening *a'*, corresponding in shape to the path of movement required for the plaiting-blade, and in which said stud *b* will work, the tongue *d*, hung in said opening, and the welt-folder arranged between the work-plate and plaiting-blade, substantially as described.

13. The combination of a stitching mechanism, a plaiting-blade adapted to receive reciprocating movement in a path down and forward in its advance, up and rearward in its retreat, mechanism, substantially such as described, to impart such reciprocating movement to said blade, the advancing movement occurring at intervals of several stitches, a pair of revolving cutters, and the welt-folder arranged between the work-plate and plaiting-blade, substantially as described.

14. The combination of a stitching mechanism, a plaiting-blade arranged upon a slide in guides parallel with the axis of the needle, a crank, and rod connecting said crank with said slide, substantially as described, and whereby the reciprocating movement imparted to the blade is downward and forward in advance, and upward and rearward in retreat, a pair of revolving cutters, and the welt-folder arranged between the work-plate and plaiting-blade, substantially as described.

15. The combination of a stitching mechanism, the slide I N, carrying the plaiting-blade, said slide arranged in a guide parallel with the axis of the needle, the said slide provided with a stud, *b*, plate provided with the opening *a'*, corresponding in shape to the path of movement required for the plaiting-blade, and in which said stud *b* will work, the tongue *d*, hung in said opening, a pair of revolving cutters, and the welt-folder arranged between the work-plate and the plaiting-blade, substantially as described.

16. The combination of a stitching mechanism, a plaiting-blade adapted to receive reciprocating movement in a path down and forward in its advance, up and rearward in its retreat, mechanism, substantially such as described, to impart such reciprocating movement to said blade, the advancing movement occurring at intervals of several stitches, a holder arranged in a plane parallel with the work-plate and movable in an elliptical path, and the welt-folder arranged between the work-plate and plaiting-blade, substantially as described.

17. The combination of a stitching mechanism, a plaiting-blade arranged upon a slide in guides parallel with the axis of the needle, a crank, and rod connecting said crank with said slide, substantially as described, and whereby the reciprocating movement imparted to the blade is downward and forward in advance, and upward and rearward in retreat, a holder arranged in a plane parallel with the work-plate and movable in an ellip-

tical path, and the welt-folder arranged between the work-plate and plaiting-blade, substantially as specified.

5 18. The combination of a stitching mechanism, the slide I N, carrying the plaiting-blade, said slide arranged in a guide parallel with the axis of the needle, the said slide provided with a stud, *b*, plate provided with the opening *a'*, corresponding in shape to the
10 path of movement required for the plaiting-blade, and in which said stud *b* will work, the

tongue *d*, hung in said opening, a holder arranged in a plane parallel with the work-plate and movable in an elliptical path, and the welt-folder arranged between the work-plate and plaiting-blade, substantially as described. 15

EMMA J. SWARTOUT.

Witnesses:

Mrs. A. B. CLAPP,
LILLIE L. CLAPP.