

(No Model.)

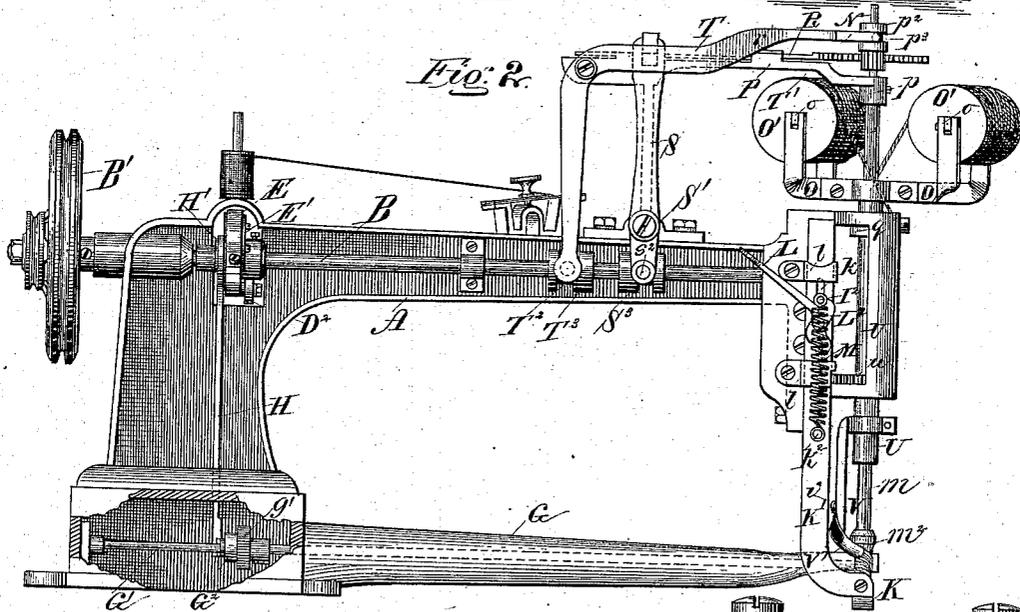
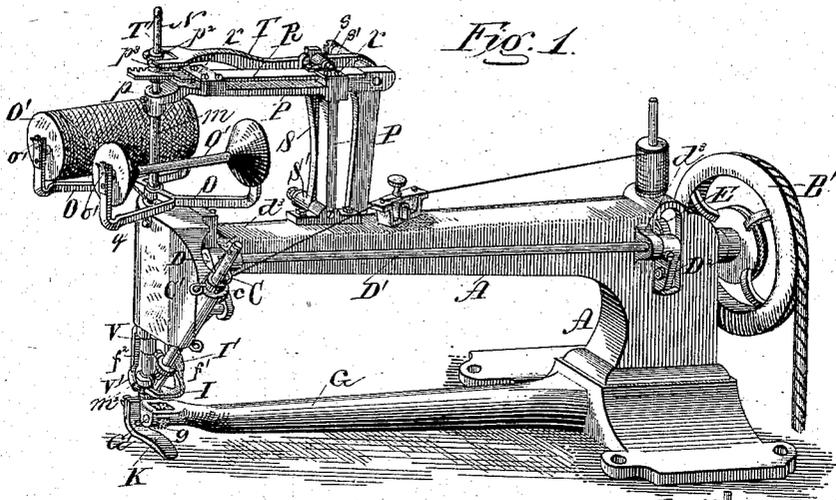
3 Sheets—Sheet 1.

S. M. LEVY & A. J. SEDMIHRADSKY.

MACHINE FOR SEWING LOOPS TO THE SURFACE OF FABRICS.

No. 293,478.

Patented Feb. 12, 1884.



Witnesses:

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(No Model.)

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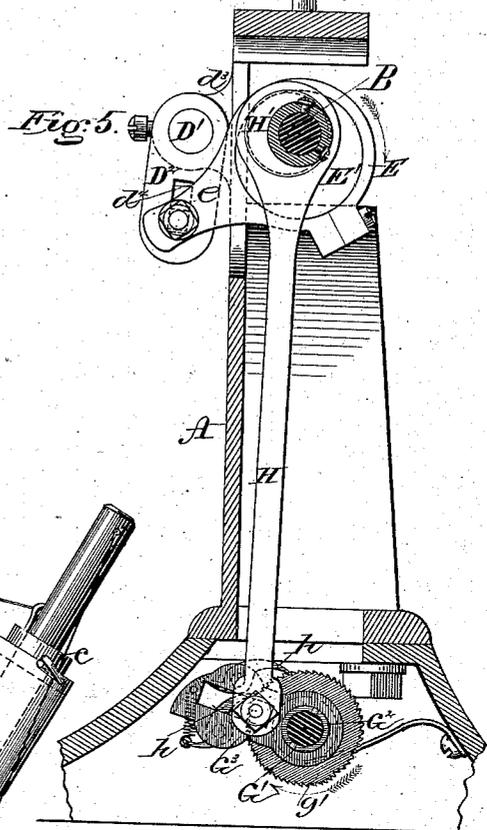
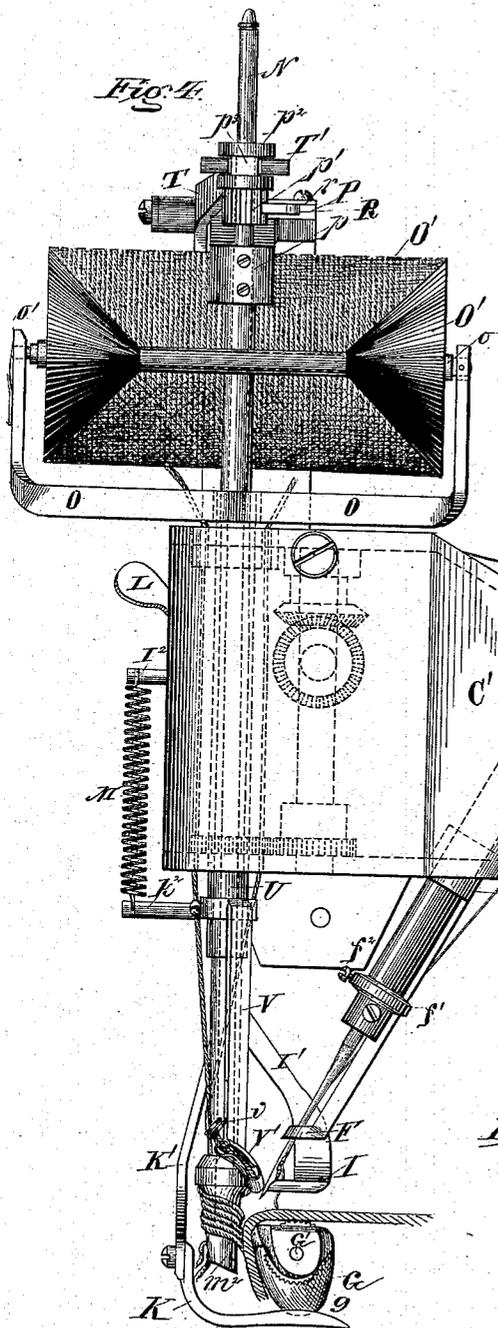
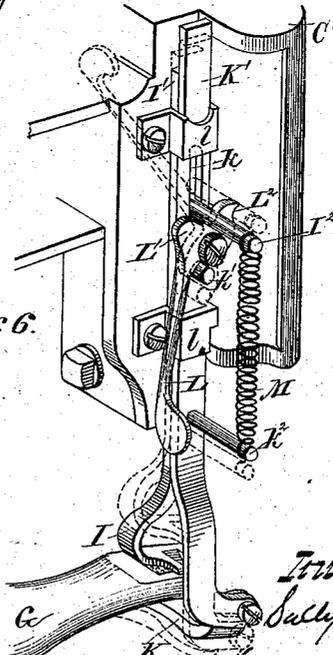


Fig. 6.



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(No Model.)

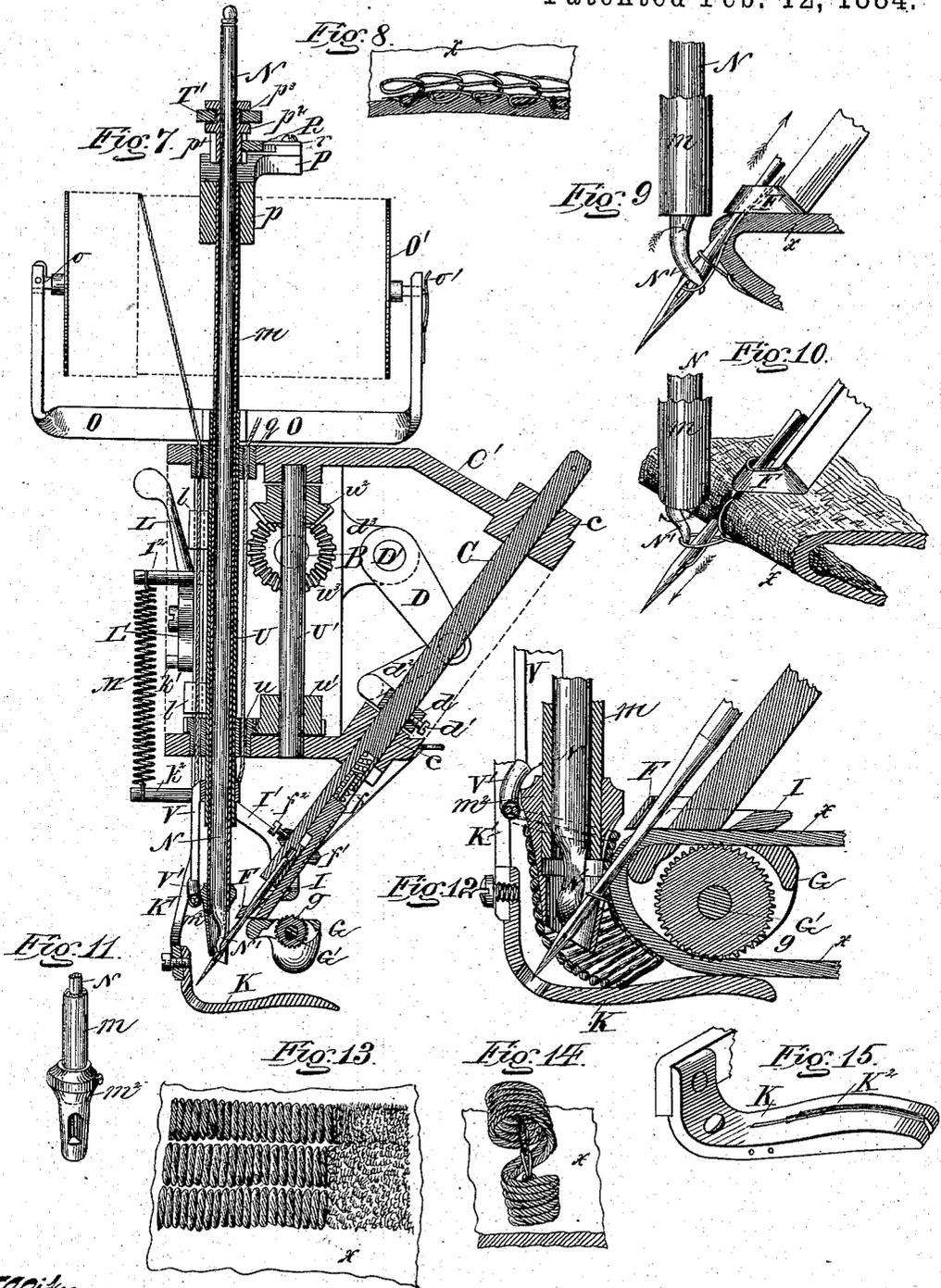
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Patented Feb. 12, 1884.



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# UNITED STATES PATENT OFFICE.

SALLY M. LEVY AND ADOLF J. SEDMIHRADSKY, OF MILWAUKEE, WISCONSIN, ASSIGNORS TO SAID LEVY.

## MACHINE FOR SEWING LOOPS TO THE SURFACE OF FABRICS.

SPECIFICATION forming part of Letters Patent No. 293,478, dated February 12, 1884.

Application filed July 10, 1883. (No model.)

*To all whom it may concern:*

Be it known that we, SALLY M. LEVY and ADOLF J. SEDMIHRADSKY, both of Milwaukee, in the county of Milwaukee, and in the State of Wisconsin, have invented certain new and useful Improvements in Machines for Folding and Sewing Loops to the Surfaces of Fabrics; and we do hereby declare that the following is a full, clear, and exact description thereof.

Our invention relates to that class of sewing-machines which form what is known as the "chain-stitch;" but it differs from the ordinary chain-stitch machines, in that the said stitches are adapted to extend into and part way through the fabric and then out on the side of entry, so that the reverse side of the work need not show any stitches whatever.

Our invention further consists in a looping device forming part of the same machine, all as will be fully described hereinafter.

In the drawings, Figure 1 is a perspective view of the entire machine, showing the front thereof. Fig. 2 is an elevation of the rear of the machine, or the side opposite to that shown in Fig. 1. Fig. 3 is a plan view of the lifting-arm and rack-bar. Fig. 4 is an elevation of the operative end of the machine. Fig. 5 is a vertical cross-section of the other end. Fig. 6 is a perspective detail view of the double foot and its connections. Fig. 7 is a vertical cross-section of the end shown in Fig. 4. Fig. 8 is a detail of the stitch. Figs. 9 and 10 are detail perspective views, showing different positions of the needle and hook while making the stitch as it secures the loop to the fabric. Fig. 11 is a detail. Fig. 12 is a sectional view, illustrating the operation of the needle and looping device as the loops are being formed and stitched to the fabric. Fig. 13 is a view of the fabric with the loops secured thereto. Fig. 14 is a view of the same with the loops bent open to show their attachment by the chain-stitch. Fig. 15 is a view of the lower foot and provided with a cutting-blade.

A is the frame of my machine, which is in many respects similar to that of any other sewing-machine.

B is the driving-shaft, and B' is the pulley by which it is driven.

C is the needle-bar, which is adapted to re-

ciprocate in inclined bearings *cc* of a housing, *C*.

*d* is a collared lug, through which the needle-bar is passed, a set-screw, *d'*, serving to secure the lug to the needle-bar. The lug *d* is connected to the crank-arm *D* of a rock-shaft, *D'*, by a link, *d''*, and the shaft *D'* is journaled in bearings *d'''*, that project out from each end of the frame, as shown in Fig. 1. The crank-arm *D* of shaft *D'* is slotted at *d<sup>1</sup>*, to take a bolt by which it is connected with a lug, *e*, on a collar, *E*, and this collar incloses an eccentric, *E'*, that is keyed or otherwise secured on the driving-shaft *B*, and therefore as this shaft revolves the eccentric will impart a reciprocating movement to arm *D*, which will cause the needle-bar to reciprocate in the direction of its length. The needle is secured in or to the lower end of bar *C* in any convenient manner. Besides the needle, the bar *C* carries a guiding-foot, *F*, on the upper end of which is a spindle carrying a spring, *f*, that is housed in a socket in the bar, while the shank of the foot plays in a recess below the spring-socket, and is recessed in its face to accommodate the needle-socket. The bar and foot are loosely bound together by a collar, *f'*, and set-screw *f''*. The spring *f* has a constant tendency to depress the foot *F* as far as the needle-socket will permit it to go when the bar *C* is lifted.

*G* is a work-arm or work-holder, which corresponds with the arm of an ordinary machine for sewing circular work. This arm is hollow, and through it a shaft, *G'*, extends from one end to the other. This shaft has suitable bearings in the work-arm and frame, and carries the feed-disk *g* on its outer end, while it has keyed on it, near its inner end, a ratchet-disk, *g'*, and beside this ratchet-disk we sleeve a collar, *G<sup>2</sup>*, having a slotted arm, *G<sup>3</sup>*, in which a wrist on one end of a cam-rod, *H*, plays, while the other end of the cam-rod fits about an eccentric, *H'*, on the driving-shaft *B*. This eccentric, as the shaft revolves, reciprocates the cam-rod *H* vertically, and causes it to partly revolve the arm *G<sup>2</sup>* about its axis and back at every revolution of the shaft *B*. On the outer end of the arm *G<sup>3</sup>* we pivot a pair of pawls, *h* and *h'*, and these are held so as to engage with the teeth of the disk *g'* in position to jig it each

time the arm  $G^3$  is lifted, but to simply ride over its teeth as the arm drops, so that the pawls will be in position to again jig the ratchet-disk as the cam-rod is again lifted, and the parts are so timed that as the arm  $D^2$  is thrown out by the lug  $e$  on collar  $E$  to lift the needle-bar, at the same time the eccentric  $H'$  will lift upon the rod  $H$ , causing pawls  $h$  to jig the ratchet-disk  $g'$ , to partially revolve shaft  $G'$  and its feed-disk  $g$ .

$I$   $K$  are presser-feet for holding the work against the feed-disk. The presser-foot  $I$  has a rectangular shank,  $I'$ , and  $K$  has a like shank,  $K'$ , and near its upper end we provide the shank  $I'$  with a bolt,  $I^2$ , that extends out at right angles to it, while the shank  $K'$  is slotted at  $k$  and carries two bolts,  $k^2$ . The shank  $I'$  is designed to lie up along the side of the housing  $C'$ , and shank  $K'$  is placed up against it with the bolt  $I^2$  projecting through its slot  $k$ , and the two are secured in place by straps  $l$ .

To shank  $K'$ , just above the bolt  $k'$ , we pivot a lever,  $L$ , having cam-head,  $L'$ , and we connect the bolts  $I^2$  and  $k^2$  by a spring or springs,  $M$ , the office of which is to lift upon the shank  $K'$  to carry its foot up against the work under the feed-disk and to depress the shank  $I'$  upon the work on top of the feed-disk, and while the feet are in this position the bolt  $I^2$  will rest in or just over an indentation in the head of lever  $L$ ; but when it is desired to carry the feet away from the work the lever  $L$  has only to be lifted, when the knob  $L'$  on its head will wedge under bolt  $I^2$ , and the cam-face  $L^2$  will press down upon bolt  $k'$  of shank  $K'$  and separate the feet, as shown in dotted lines, Fig. 6, and the shape of the cam-head is such that when the parts are in the position shown in dotted lines they will be held by the tension of the spring  $M$  until power is applied to the handle of lever  $L$  to again depress it, and thus the work is clamped about the feed-disk by a single movement of the lever  $L$ .

$N$  is a spindle, having a looping-hook,  $N'$ , on its lower end for making the chain-stitch. This spindle rises up through a sleeve,  $m$ , in the housing  $C'$ , above which it forms a bearing for a bobbin-frame,  $O$ , above which its upper end is supported by a collar,  $p$ , of a bracket,  $P$ , one end of which rests upon and is bolted to the frame  $A$ . The spindle  $N$  projects some distance above collar  $p$ , to receive a pinion,  $p'$ , having an extension or hub,  $p^2$ , in which is an annular groove,  $p^3$ . A bar,  $R$ , is loosely secured upon the upper side of the bracket by plates  $r$ , and at one end an edge of this bar is serrated, as at  $R'$ , to form teeth that engage with those of the pinion  $p'$ , while its rear end is connected with the upper end of an arm,  $S$ , by a wrist-pin,  $s$ , and sleeved lug  $s'$ , as shown in Fig. 3. The arm  $S$  is pivoted to the frame  $A$  at  $S'$ , and on its lower end has a lug,  $s^2$ , that projects into the cam-groove of a collar,  $S^3$ , on shaft  $B$ , and therefore as the shaft  $B$  revolves it will vibrate the arm  $S$  and cause it to reciprocate the bar  $R$ , and its teeth will impart a

rotary reciprocating movement to the spindle  $N$ , that its hook may alternately catch and release the thread as the needle rises and falls, while the necessary up-and-down motion of the hook is made by an elbow,  $T$ , one end of which is bifurcated at  $T'$  to enter the groove  $p^3$  of collar  $p^2$ , and its other end engages with a cam-groove,  $T^2$ , in a collar,  $T^3$ , on shaft  $B$ , while at its bend it is pivoted to bracket  $P$ ; and to admit of this vertical play taking place without interrupting the rotation of the spindle, the pinion  $p'$  is made of very much greater depth than would be necessary if the spindle had no vertical play.

Below the bobbin-frame  $O$  the sleeve  $m$  carries a sleeve,  $U$ , and this in turn carries a pinion,  $u$ , near its lower end, that meshes with another pinion,  $u'$ , on a short upright shaft,  $U'$ , whose ends are journaled in the top and bottom of the housing  $C'$ , and which, near its upper end, has a bevel-pinion,  $u^2$ , that meshes with a corresponding bevel-pinion,  $u^3$ , on the front end of shaft  $B$ , which projects into the housing  $C'$ , so that the motion of shaft  $B$ , communicated through shaft  $U'$ , will revolve the pinion  $u$ .

$V$  is a hanger that is suspended from near the bottom of sleeve  $U$ , and this has near its lower end a loop,  $v$ , that guides the yarn into a carrier,  $V'$ , with which the lower end of the hanger terminates.

The sleeve  $m$  is provided on its lower end with a thimble,  $m^2$ . This thimble has a slot on one side, as shown in Fig. 11, to receive the needle, and has an inclined bottom, which permits the needle, after entering the slot, to pass under its rear edge in making a full stroke. The thimble  $m^2$  is also made tapering on its outside to receive the yarn as the carrier  $V'$  revolves about it.

The frame  $O$  carries two bobbins,  $O' O'$ , from each of which a strand of yarn is led down through a collar,  $q$ , in the upper part of housing  $C'$ , pinion  $u$ , housing  $C'$ , the loop  $v$ , and carrier  $V'$ , and thence around the thimble  $m^2$  for the needle to pass into after it passes through the cloth  $x$ , to which it is being sewed, and as the cloth is clamped onto the work-arm, so that only its folded edge is presented to the needle, the needle will enter and pass out at the same side of the cloth, and the thread will only appear on that side, the foot  $F$ , through which the needle passes, serving to guide it and to give it the necessary rigidity. When the yarn covering is to be left upon the cloth in spiral rolls such as shown to the left in Fig. 13, the foot  $K$  is to be merely of metal polished on top and perforated at its heel to permit the needle to pass down through it; but when a covering such as in the right of Fig. 13 is desired, we substitute for the smooth foot one that carries a knife,  $K^2$ , that, as the cloth is fed away from the needle will engage with the spirals and split them to form a plush. Instead of perforating the foot  $K$  for the passage of the needle through it, we may give suffi-

cient downward curve to the heel to carry it below the farthest limit of the needle's descent.

5 That the spools or bobbins O' may be easily removed from their frame, we pivot or hinge each of their axles o to one arm of its frame, and slot the other arm to permit the corresponding end of the axle to drop into it, where it is held in place by a spring, o'.

10 The housing C' is secured to the frame A by bolts that pass through slots in the housing, that permit it to be moved laterally a very short distance; but this range of adjustment is sufficient for gaging the distance between the needle and the thimble.

15 Although, in order to more fully illustrate the operation of our machine, we have described a process for its use and a product made thereby, we lay no claim to such special process and product in this application, reserving the same for a separate application, filed on the 14th day of January, 1884, Serial No. 117,432, wherein such matter is fully shown, described, and claimed.

25 What we claim as new and desire to secure by Letters Patent, is—

1. In a machine for stitching loops to the surface of fabrics, a needle provided with means for reciprocating it on an incline, co-operating stitch-forming mechanism, and an arm provided with means for presenting the fabric to the needle in successive bends, in combination with mechanism for laying the material of which the loops are formed up against the fabric in the line of travel of the needle, substantially as set forth.

2. The looping-spindle and sleeve surrounding it and carrying the feeding-thimble, in combination with the needle adapted to recip-

40 rocate on an incline, the yarn-guide and its shaft, a pinion carried by the latter, and the driving-shaft geared to said pinion and to the driving mechanism of the machine, substantially as set forth.

3. The combination of two presser-feet, an elastic connection for drawing them toward each other, and a lever having a cam-head for separating them, in combination with the work-arm for supporting the fabric, substantially as set forth.

4. The combination of shaft B and its cams T<sup>3</sup> and S<sup>3</sup>, levers T and S, bar R, looping-spindle, pinion p', and inclined needle, with the driving mechanism of the machine and intermediate connections, substantially as set forth.

5. In a machine for sewing loops to fabrics, the combination, with the work-arm and its feed-disk, of a foot for supporting the work up under and against the feed-disk, and a cutting-blade fixed in said foot, substantially as set forth.

6. The combination of the inclined needle-bar and needle, a vertical looping-spindle, a work-arm carrying a feed-disk, and adapted to present the fold of the fabric to the action of the needle, and an upper and a lower presser-foot and operating mechanism, substantially as described, whereby a chain-stitch may be made in only one surface of the fabric, substantially as set forth.

In testimony that we claim the foregoing we have hereunto set our hands, on this 16th day of May, 1883, in the presence of two witnesses.

SALLY M. LEVY.

ADOLF J. SEDMIHRADSKY.

Witnesses:

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M. KAUMHEIMER.