O. E. BROWN.

WORK HOLDER FOR SEWING MACHINES.

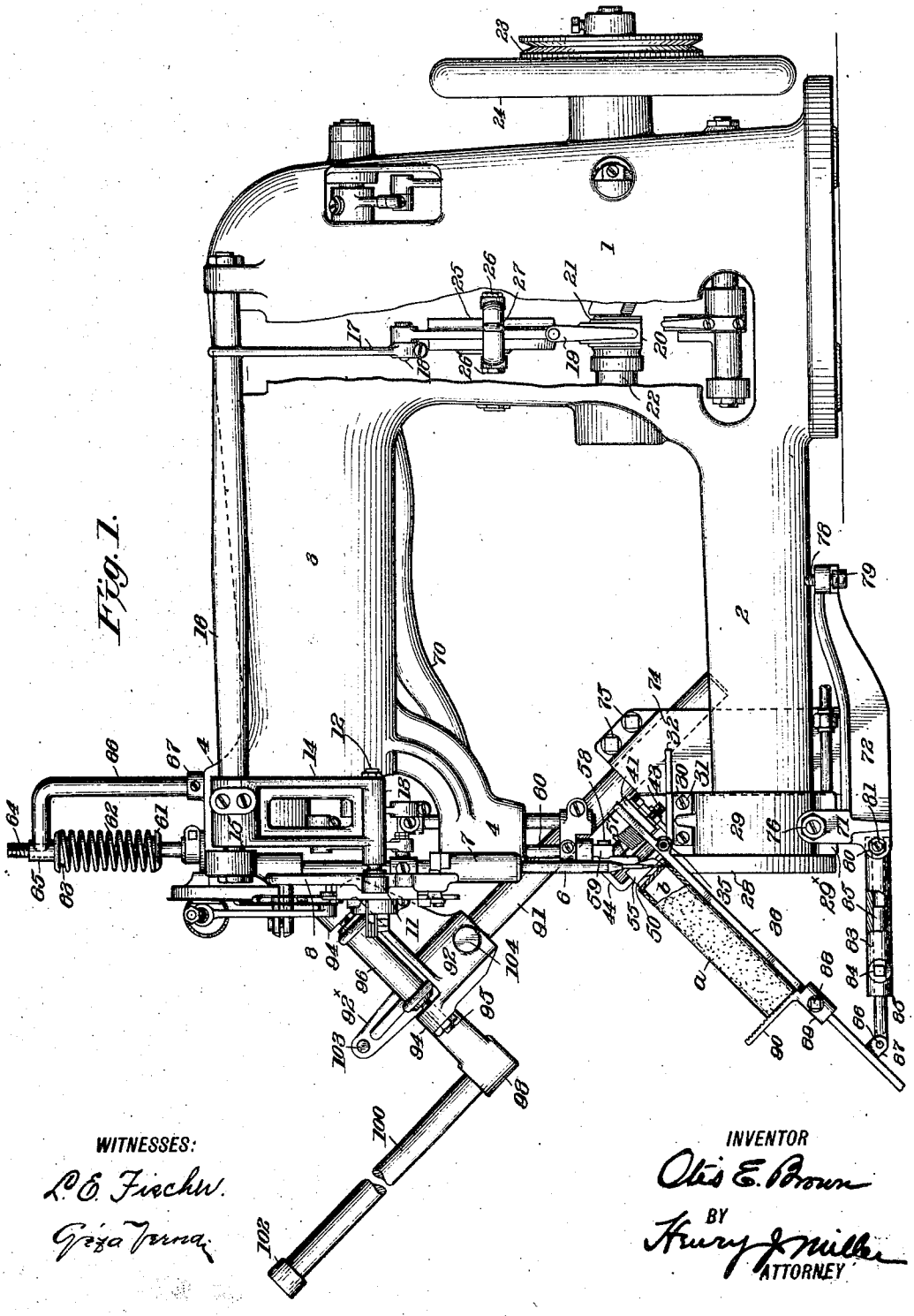
APPLICATION FILED SEPT. 27, 1911.

1,136,651.

Patented Apr. 20, 1915.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:

P. E. Fischer.

Geza Varna.

INVENTOR

Otis E. Brown

BY

Henry J. Miller

ATTORNEY

O. E. BROWN.

WORK HOLDER FOR SEWING MACHINES.

APPLICATION FILED SEPT. 27, 1911.

1,136,651.

Patented Apr. 20, 1915.

2 SHEETS—SHEET 2.

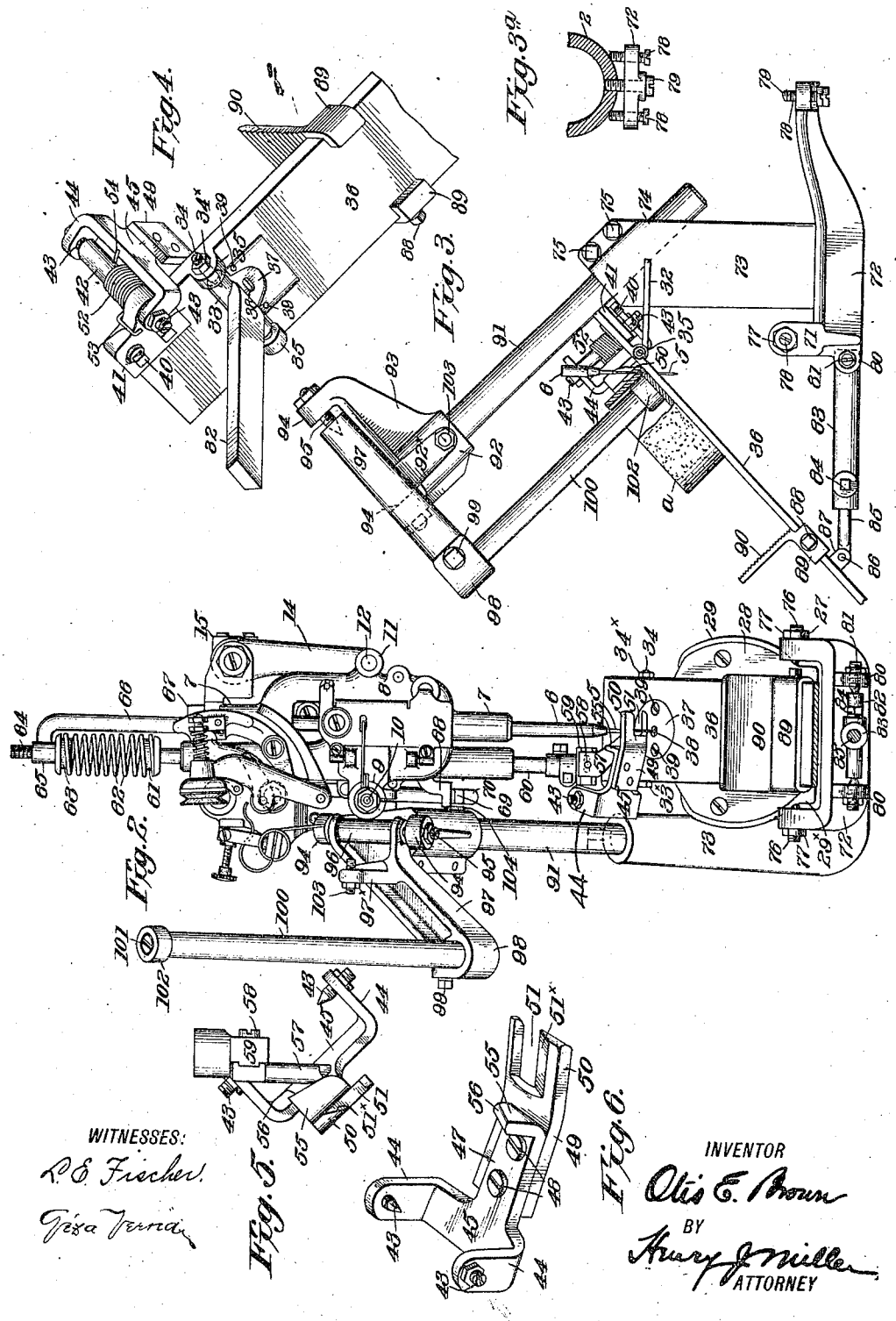


Fig. 2.

Fig. 3.

Fig. 3a.

Fig. 4.

Fig. 5.

Fig. 6.

WITNESSES:

P. E. Fischer.

Geza Ferraris

INVENTOR

Otis E. Brown

BY

Henry J. Miller

ATTORNEY

UNITED STATES PATENT OFFICE.

OTIS E. BROWN, OF BROCKTON, MASSACHUSETTS, ASSIGNOR TO THE SINGER MANUFACTURING COMPANY, A CORPORATION OF NEW JERSEY.

WORK-HOLDER FOR SEWING-MACHINES.

1,136,651. Specification of Letters Patent. Patented Apr. 20, 1915.

Application filed September 27, 1911. Serial No. 651,555.

To all whom it may concern:

Be it known that I, OTIS E. BROWN, a citizen of the United States, residing at Brockton, in the county of Plymouth and State of Massachusetts, have invented certain new and useful Improvements in Work-Holders for Sewing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to an improvement in machines designed for stitching together the angularly disposed edges of the sides and ends of various receptacles formed especially from pieces of leather, such as cycle tool-cases, knapsacks, cartridge boxes and field-glass cases. In the construction of such receptacles, the pieces of material constituting the sides and ends of the same, when formed with substantially flat faces in angular relation, are fastened upon a wooden block or last with the junction of their adjacent edges at the required angle and are presented to the stitch-forming mechanism with such faces disposed at an angle with the needle, so that the fastening stitches pass through both pieces of material at their junction in a direction inclined to both of such faces.

The present invention has for its object to firmly sustain and guide the unstitched receptacle in inclined relation to the reciprocating needle and to maintain the component edges of the material forming the corner to receive the stitching firmly pressed together to insure the effective and uniform laying of the stitches.

It has for its further object to adapt the work-holding means for presenting the work in different angular relations to the needle for application of the stitches at the required inclination with the faces of the material to correspond with the relative thicknesses of the pieces of material whose edges are to be secured together.

While the present improvement is not limited to any type or class of sewing machine, it is preferably applied to a needle-feed sewing machine of the type represented in my United States Patent No. 1,002,217, dated September 5, 1911. In its preferred form, the work-holder comprises a work-plate pivotally connected with the frame of the machine and provided with adjustable means for maintaining it in acute-angular relation with the needle, combined with a presser-foot pivotally mounted thereon and movable in a direction substantially parallel with the face of the same. The usual spring-pressed presser-bar of the machine is adapted to rest upon such presser-foot and to force it into operative engagement with one face of the receptacle to be stitched whose adjacent face rests upon the work-plate. Suitable means are provided for engagement with the opposite end of the receptacle to sustain the thrust of the presser-foot or, in case of articles permitting the stitching without the employment of a last, entering the article and sustaining from the interior thereof the part of the same engaged exteriorly by the presser-foot.

In the accompanying drawings, Figure 1 is a side elevation of a sewing machine provided with a work-holder constructed in accordance with the present invention, and Fig. 2 a front end view of the same. Fig. 3 is a detached side elevation of the work-holder showing in operative position one of the thrust-sustaining members which is represented in the preceding figures in its retracted inoperative position, and Fig. 3ª is a detail view showing the adjusting means for the work-holder frame. Fig. 4 is a detached perspective view of a portion of the work-support and the presser-foot mounted thereon. Fig. 5 is a front end view of the presser-foot and Fig. 6 a perspective view of the same viewed from the upper side.

As represented in the drawings, the frame of the machine comprises the hollow standard 1 with cylindrical work-supporting arm or horn 2 and hollow overhanging bracket-arm 3 terminating in the usual head 4. The needle 5 is mounted in the vertically reciprocating needle-bar 6 journaled in the bearing bosses 7 of the laterally jogging needle-frame 8.

The needle-frame is provided at one side with the split boss 9 in which is mounted the stud 10 slidingly sustained in a transverse runway of the frame as described in

my said patent, and said frame has at the opposite side a boss 11 entered by a pivotal pin 12 journaled in the transverse tubular member 13 of the swinging frame 14 whose hub 15 is secured upon the feed rock-shaft 16 journaled upon the bracket-arm 3 and having the depending crank-arm 17. The crank-arm 17 carries the pivotal pin 18 embraced by the upper end of the swinging feed-lever 19 having forked lower end 20 which embraces the feed-actuating cam 21 upon the main-shaft 22 carrying the belt-wheel 23 and adjacent hand-wheel 24. The feed-lever 19 is in practice formed intermediate its ends with a longitudinal guideway 25 entered by movable fulcrum-pins 26 carried by a transverse feed-adjusting lever 27. By means of the feed-actuating mechanism just described, the needle-frame receives lateral jogging movements crosswise of the horn 2 which are transmitted to the needle while in the work, by means of which the latter is advanced to space the stitches.

A suitable loop-taker is provided to coöperate with the needle in the production of stitches, and in the present machine is in the form of an oscillating shuttle mounted in the race 28 secured to the forward end of the work-supporting arm 2.

The forward portion of the arm or horn 2 is shown formed with an enlargement 29 provided upon its upper side with a divided clamp-lug 30 in which is secured by means of the clamp-screws 31 the flat bar 32 provided at its forward end with the cross-bar 33 having sockets in its extremities to receive the conical points of the bearing screws 34 tapped into the spaced lugs 35 upon the under side of the work-plate 36 and affording fulcra for the latter. Set nuts 34^{x} are provided for securing the fulcrum-screws in position. Near its fulcrum point, the work-plate 36 is suitably apertured to receive the throat-plate 37 formed with the inclined needle aperture 38 and secured in position by means of the screws 39.

Near its upper or inner end, and at one edge, the work-plate has secured thereon by means of screws 40 the fulcrum-plate 41 formed with the rigid fulcrum-pin 42 having axial sockets therein. The said sockets are entered by the points of the center-screws 43 tapped into the spaced ears 44 of the yoke 45 formed at one end of the presser-foot shank 47 to which is secured by means of the fastening screws 48 the pressure plate 49 having its forward portion 50 slightly inclined to the body portion and provided with the needle aperture 51 having one of its walls 51^{x} beveled to afford clearance for the needle to whose path of reciprocation the member 50 is inclined. The stud 42 is shown embraced by a spring 52 having one arm 53 in engagement with the fulcrum-plate 41 and another arm 54 resting against the yoke 45 by means of which the presser-foot is normally pressed toward the upper extremity of the work-plate.

The forward extremity of the presser-foot shank 47 is formed with an upturned lug 55 having an inclined edge 56 upon which rests the correspondingly inclined lateral face of the bearing plate 57 secured by means of the screw 58 upon the block 59 carried by the lower end of the presser-bar 60 which is journaled in the bracket-arm head 4. The presser-bar is provided at its upper end with a shouldered thrust collar 61 to receive one end of the pressure spring 62 whose opposite end rests against the shouldered head 63 of a screw 64 tapped in the threaded boss 65 of the lateral arm of a rigid post 66 secured in the boss 67 upon the top of the head 4 of the bracket-arm. The presser-bar has fixed thereon the rearwardly extending arm 68 adapted to be engaged by the forward extremity 69 of the presser-bar lifting lever 70 fulcrumed upon the rearward side of the bracket-arm 3 and operated in the usual manner. When the presser-bar is lifted, the presser-foot rises under the action of its respective spring in a direction inclined to the presser-bar and substantially parallel with the face of the work-support, and when the presser-bar is released the action of the pressure spring 62 thereon serves to press the bearing plate 57 forcibly against the relatively inclined edge 56 of the lug 55 with a wedge-like action to forcibly press the notched operative portion of the pressure plate 49 against the work resting upon the work-plate.

The member 29 of the horn 2 is shown provided on its under side with an extension 29^{x} which is embraced by the yoke 71 at the forward end of the tilting frame 72 formed at one side and rearward of the horn 2 with an upright standard 73 having an upwardly inclined split socket 74 with the clamp-screws 75. The yoke 71 is hung from the member 29^{x} by means of the pivotal center-screws 76 provided with set-nuts 77 and carries at its rearward extremity the adjusting push-screws 78 whose points rest against the under side of the horn 2 while the intermediate pull-screw 79 is tapped into the horn 2. By means of the screws 78 and 79, the inclination of the frame 72 relatively to the horn 2 may be adjusted.

The forward end of the frame 72 is provided with the spaced lugs 80 carrying the center-screws 81 entering sockets in the cross-member 82 of a tubular bar 83 in which is secured by means of the set-screw 84 one end portion of a rod 85 pivotally secured by means of the pin 86 between the lugs 87 upon the under side and near the lower end of the work-plate 36. By loosening the set-screw 84, the inclination of the work-plate relatively to the needle may ob-

viously be adjusted through the lengthening or shortening of the extensible brace afforded by the members 83 and 85 between the frame 72 and the work-plate.

Loosely embracing the lower portion of the work-plate, and adjustably secured thereon by means of the set-screw 88 is the tubular slide-block 89 carrying the thrust-plate 90 disposed at right angles to the face of the work-plate and having its upper face serrated to receive the lower end of the object to be stitched as represented in Fig. 1. The thrust-plate 90 is adjustable toward and from the needle and the presser-foot to accommodate articles of different sizes and serves to sustain the latter in opposition to the thrust imposed thereon by the presser-foot in the stitching operation.

In the use of the machine, as thus far described, the article *a* to be stitched, whose component pieces of material are temporarily secured upon the wooden block or last *b*, is placed upon the work-plate with its lower end resting against the thrust-plate 90 which latter is so adjusted that the needle will pass through the marginal portions of material at the upper corner without entering the interior of the article, the inclination of the work-plate having been previously adjusted to the desired angle and the presser-foot having been permitted to assume retracted position under the action of its spring by the lifting of the presser-bar. The lowering of the presser-bar now causes the thrust of the pressure spring 62 to be transmitted to the presser-foot which presses the overlapping end of the receptacle upon the abutting side member, after which the machine is set in motion. In the stitching operation, the needle applies the stitches at an inclination to both the adjoining faces of the lasted object to which it imparts a step-by-step feeding movement in which it is accurately guided by the thrust-plate 90 engaging its opposite end, the operator merely turning the object as the stitching reaches the end of each flat face of the same preparatory to the stitching of the succeeding edge, in case the stitching is to be carried around one or more of the corners of the object. By lifting the presser-bar, the presser-foot is permitted to disengage itself from the work which then may be readily removed.

For stitching of boxes or other objects not having flat faces to slide along the thrust-plate 90, additional means are provided for coöperation with the work-plate and presser-foot above described.

In the socket 74 of the standard 73 is adjustably secured the upwardly inclined bar 91 to whose upper end is secured the boss 92 of a bracket 93 having the spaced bearing lugs 94 carrying center-screws 95 which enter suitable apertures in the ends of the member 96 of a swinging arm 97 formed with a split socket 98 in which is adjustably secured by means of the clamp-screw 99 one end of a thrust-bar 100 whose opposite end is provided with the journal-pin 101 upon which is mounted the roller 102. The arm 97 is formed with a lug 97× carrying the adjustable stop-screw 103 whose point is adapted to engage a seat 104 upon the boss 92 when the thrust-bar 100 is in operative position.

When the adjustable thrust-plate 90 is in use, the thrust-bar 100 may be turned upon its center-screws 95 upwardly into inoperative position, as represented in Figs. 1 and 2; but when the thrust-plate is sufficiently retracted, the thrust-bar 100 may be swung downwardly into operative position at substantially a right angle with the work-plate and with its bearing roller 102 spaced from the latter a distance equal to about the thickness of the material to be stitched, as represented in Fig. 3.

In the use of the attachment with the thrust-bar 100, the cylindrical article to be stitched, which has previously had its component pieces of material secured in proper relation by tacking or otherwise, is placed upon the outer extremity of the thrust-bar with the roller 102 entering the angle between its side and end walls, and the bar is then swung into operative position to enable the end of the object to rest upon the inclined work-plate adjacent the path of the needle. The position of the bar 100 is then properly adjusted by adjusting the position of the same in its socket 98 and that of the bar 91 both circularly and endwise in its respective socket, after which the presser-bar is lowered and the stitching mechanism set in operation. In this adjustment of the device, the feeding movements of the needle and the guiding action of the roller 102 serve to impart to the article step-by-step rotary movements to accurately apply the stitches around the corner of the same without special attention on the part of the operator. As the bar 100 is laterally offset from the supporting bar 91 by means of the swinging arm 97, it will be seen that the circular adjustment of the bar 91 in its split socket 74 will effect a lateral adjustment of the position of the bar 100 toward or from the stitching point and in a direction substantially lengthwise of the work-plate 36.

It will be observed that each of the described thrust-sustaining members is capable of adjustment in a direction lengthwise, or substantially lengthwise of the work-plate to accommodate different classes of work and is also adjustable with the work-plate to determine its angular relation with the direction of thrust of the needle.

While the presser-foot is herein shown

mounted upon a fulcrum sustained by the work-plate and disposed perpendicular thereto, it is evident that in its broader aspect the present invention is not limited to the particular manner in which the presser-foot is sustained in relation to the work-plate, so long as it is capable of applying pressure to the work in a direction substantially parallel with the operative face of the work-plate.

Having thus set forth the nature of the invention, what I claim herein is:—

1. In a sewing machine, the combination with stitch-forming mechanism, of a work-plate, a spring-pressed presser-bar movable toward and from said work-plate, a presser-foot disposed above the work-plate, said presser-foot being movable angularly with respect to the presser-bar and adapted to transmit the thrust of the presser-bar in a plane substantially parallel with the work-plate, and means for holding the work against lateral displacement under the action of the presser-foot.

2. In a sewing machine, the combination with stitch-forming mechanism, of a work-plate, a spring-pressed presser-bar movable toward and from said work-plate, and a presser-foot mounted independently of and movable in a direction in angular relation with said presser-bar and adapted to transmit to the work sustained by the work-plate the thrust of the presser-bar.

3. In a sewing machine, the combination with stitch-forming mechanism, of a work-plate, a spring-pressed presser-bar movable toward and from said work-plate, a presser-foot mounted independently of and movable relatively to said presser-bar and adapted to transmit to the work sustained by the work-plate the thrust of the presser-bar, and a spring applied to the presser-foot and acting thereon in opposition to the thrust of the presser-bar.

4. In a sewing machine, the combination with stitch-forming mechanism including a reciprocating needle, of a work-plate, means for adjusting the angular relation of said work-plate with the needle, a presser-foot movably mounted upon said work-plate, and means sustained independently of the work-plate for pressing said presser-foot against the work sustained by the work-plate.

5. In a sewing machine, the combination with stitch-forming mechanism including a needle, of a work-plate inclined to said needle, a presser-foot movable substantially parallel with the face thereof, and spring-actuated means applied to the presser-foot for pressing it against the work sustained by said work-plate.

6. In a sewing machine, the combination with stitch-forming mechanism, of a work-plate, a presser-foot mounted thereon and movable substantially parallel with the face thereof, and spring-actuated means applied to the presser-foot for pressing it against the work sustained by said work-plate.

7. In a sewing machine, the combination with stitch-forming mechanism including a reciprocating needle, of a work-plate sustained at an acute angle with said needle, a presser-foot movable substantially parallel with the face thereof, spring-actuated means applied to the presser-foot for pressing it against the work sustained by said work-plate, and means adapted for engagement with the work to sustain the thrust of the presser-foot thereon.

8. In a sewing machine, the combination with stitch-forming mechanism including a reciprocating needle, of a work-plate disposed at an inclination to said needle, a spring-pressed presser-bar arranged substantially parallel with the needle, and a presser-foot movable substantially parallel with the face of the work-plate and adapted to transmit to the work sustained by the work-plate the thrust of the presser-bar.

9. In a sewing machine, the combination with stitch-forming mechanism including a reciprocating needle, of a work-plate disposed at an inclination to said needle and provided with means for adjustment of the degree of such inclination, a presser-foot movable substantially parallel with the face of said work-plate, spring-actuated means applied to the presser-foot for pressing it against the work sustained by said work-plate, and work-engaging means adjustable correspondingly with said work-plate for receiving the thrust of the presser-foot upon the work.

10. In a sewing machine, the combination with stitch-forming mechanism including a reciprocating needle, of a work-plate disposed at an inclination to said needle and provided with means for adjustment of the degree of such inclination, a presser-foot movable substantially parallel with the face of said work-plate, spring-actuated means applied to the presser-foot for pressing it against the work sustained by said work-plate, and work-engaging means sustained by and adjustable with said work-plate for receiving the thrust of the presser-foot upon the work.

11. In a sewing machine, the combination with stitch-forming mechanism including a reciprocating needle, of a work-plate, means for adjusting said work-plate to various degrees of inclination with said needle, a swinging presser-foot, a fulcrum therefor disposed perpendicular to the operative face of said work-plate, and spring-actuated means for pressing the presser-foot against the work.

12. In a sewing machine, the combination with stitch-forming mechanism including a reciprocating needle, of a work-plate sus-

tained at an inclination with said needle a swinging presser-foot, a fulcrum therefor sustained by said work-plate in angular relation with its operative face, and spring-actuated means for pressing the presser-foot against the work.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

OTIS E. BROWN.

Witnesses:
HENRY J. MILLER,
HENRY A. KORNEMANN, Jr.