

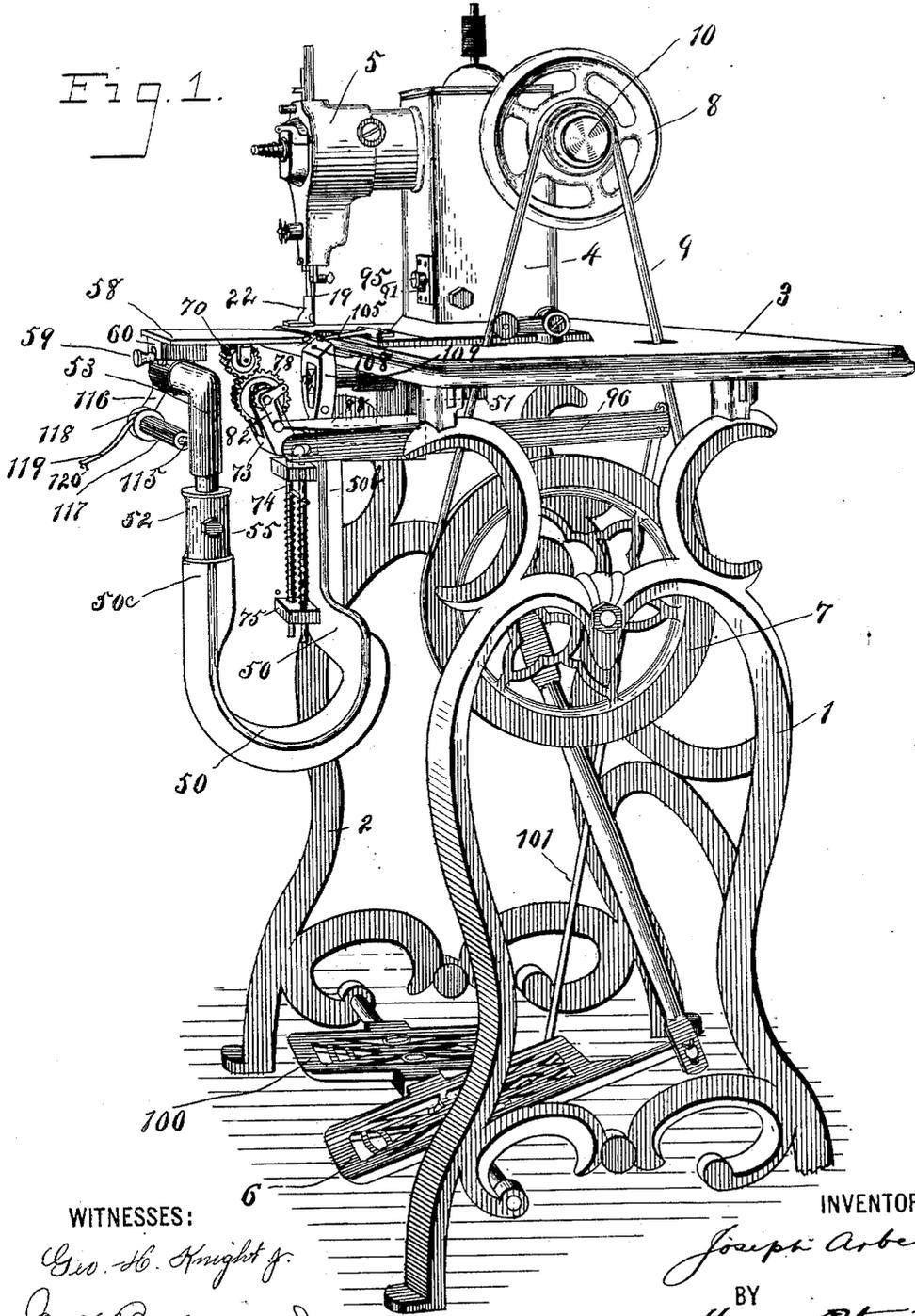
(No Model.)

4 Sheets—Sheet 1.

J. ARBES.  
MACHINE FOR BLIND STITCHING.

No. 595,090.

Patented Dec. 7, 1897.



WITNESSES:

*Geo. H. Knight Jr.*  
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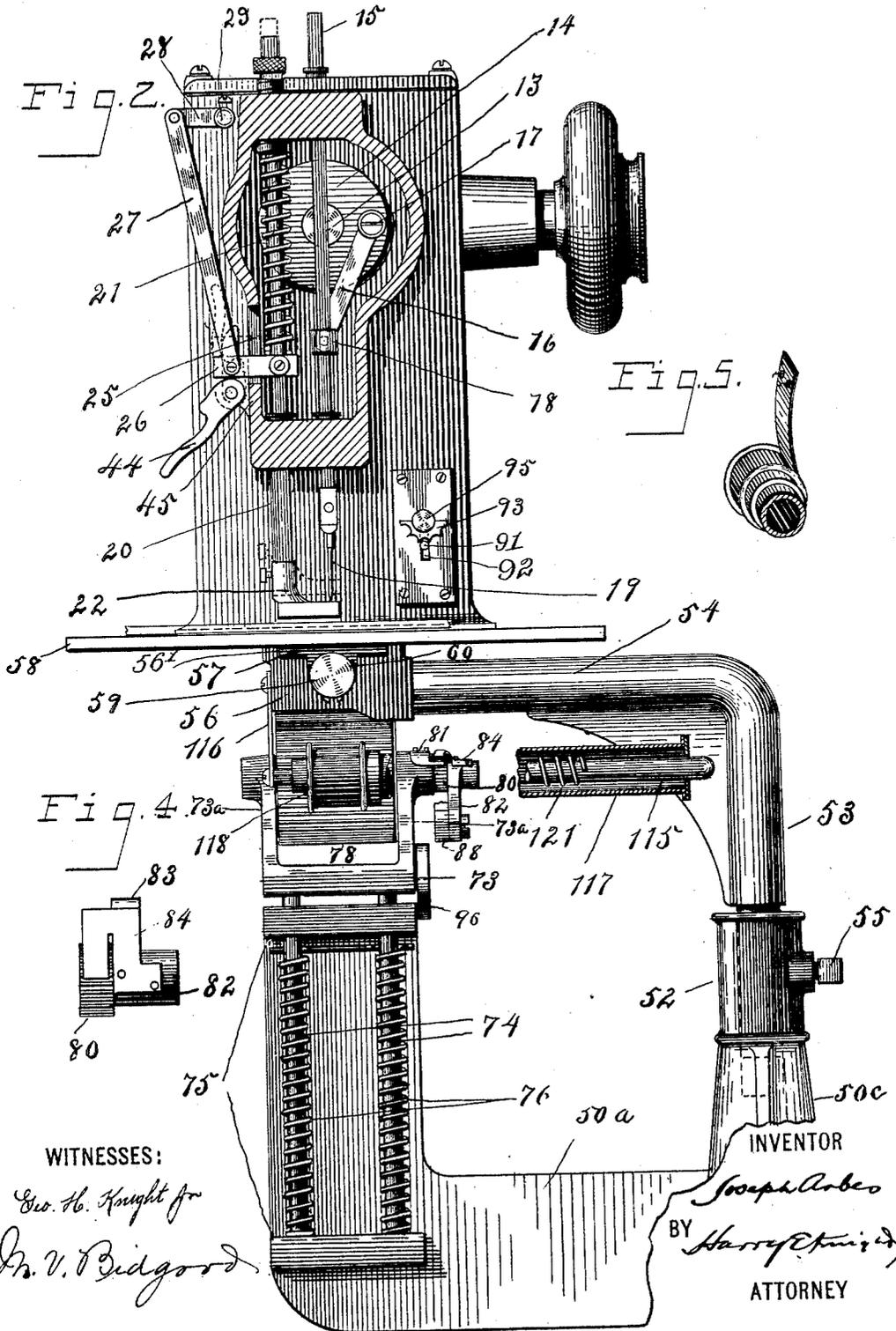
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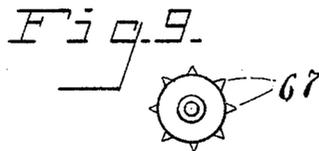
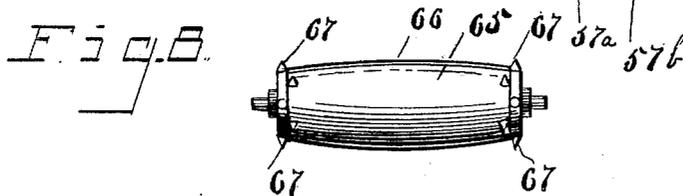
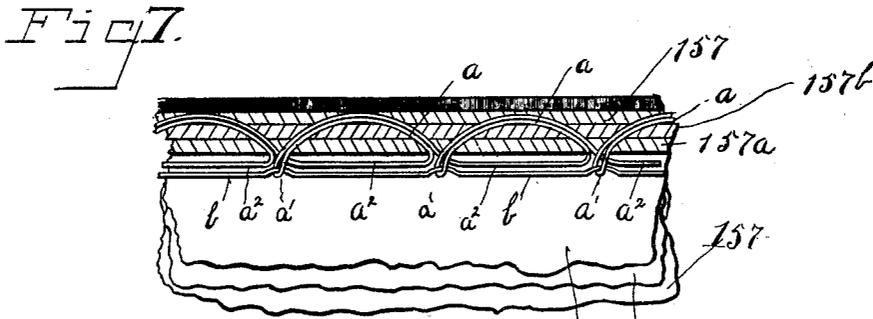
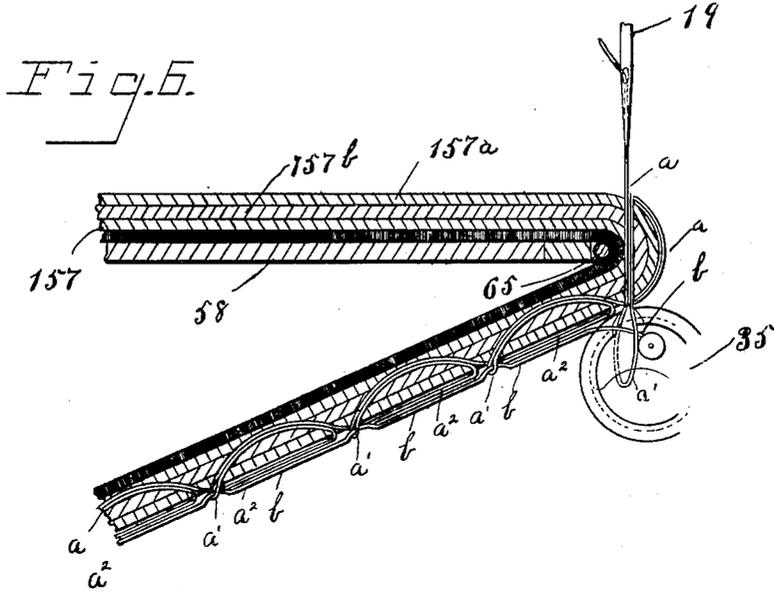
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4 Sheets—Sheet 4.

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WITNESSES:

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# UNITED STATES PATENT OFFICE.

JOSEPH ARBES, OF NEW YORK, N. Y.

## MACHINE FOR BLINDSTITCHING.

SPECIFICATION forming part of Letters Patent No. 595,090, dated December 7, 1897.

Application filed April 17, 1897. Serial No. 632,606. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH ARBES, a citizen of the United States, residing at New York, in the county and State of New York, have invented certain new and useful improvements in Sewing-Machines for Blindstitching, of which the following is a specification.

My invention relates to certain improvements in sewing-machines which are particularly valuable for effecting what is commonly known as "blindstitching." This form of stitching is necessarily employed in sewing a lining to the inner surface of a piece of cloth or in hemming the edge of a piece of cloth. Blindstitching is also employed for sewing the lining upon furs, inclosing the wadding between the lining and the skin, for instance, in lining fur trimming.

Though my improvements are particularly useful for blindstitching, the machine is also capable of performing other forms of sewing, as will be clear from the description.

The main feature of novelty in my improved machine is the machine-table or cloth-supporting plate formed in two parts, which are mounted, respectively, upon the arms of an approximately U-shaped frame, with their adjacent edges forming a cloth opening or slot in the path of the needle, extending from side to side of the machine to permit the insertion of the cloth from either side. I also combine with my improved cloth-supporting plate a spring-actuated roller located beneath the plate and having a tape wound upon the roller and provided with cloth-engaging means whereby the tape may be passed up through the cloth opening or slot and attached to the cloth or work and feed it over the feed-plate and down through the cloth-opening to the feed mechanism. The feeding mechanism comprises, preferably, a pair of rubber-faced feed-rolls, one of which is mounted upon a spring-pressed head and is provided with a ratchet-feeding device. A controlling-lever engages the spring-pressed head for throwing the feed-rolls apart when it is desired to insert or remove a piece of work.

In order that my invention may be fully understood, I will first describe the same with

reference to the accompanying drawings and afterward point out the novelty with more particularity in the annexed claims.

In said drawings, Figure 1 is a front perspective view of my improved sewing-machine. Fig. 2 is a front elevation of the main parts of the same, parts being broken away. Fig. 3 is a side elevation of the same with parts broken away. Fig. 4 is a detail view of the spring-pawl of the ratchet-feed. Fig. 5 is a detail perspective view of the feeding-tape and part of the spring-roll. Figs. 6 and 7 are sectional views illustrating the work of my improved machine. Figs. 8 and 9 are detail front elevation and end views of the needle-guide roll, which is journaled in the feed-plate.

1 and 2 are side frames of an ordinary sewing-machine, and 3 is the main portion of the sewing-machine table mounted upon the side frames 1 and 2.

4 is the sewing-machine arm, and 5 is the head supported upon the arm.

6 is the treadle operating the driving-wheel 7, which drives the fly-wheel 8 by means of the belt 9. Fly-wheel 8 is keyed to the end of a shaft 10, journaled in one side of the sewing-machine arm 4 and carrying at its inner end a bevel-pinion 11, which gears with a similar pinion 12, keyed to a shaft 13, journaled in the sewing-machine arm 4 and head 5. Shaft 13 carries a crank-disk 14 at its forward end, in the head 5, and operates the needle-bar 15 by means of a link 16, pivotally connected to the crank-disk at 17 and to a collar 18 upon the needle-bar.

19 is the needle.

20 is the presser-foot bar, mounted in the sewing-machine head 5, provided with the spiral spring 21, which operates in the usual manner for forcing the presser-foot 22 downwardly into engagement with the cloth upon the feed-table.

The presser-foot 22 is preferably faced with rubber 22', as shown in the drawings.

In one edge of the sewing-machine head 5 is formed a vertical slot 25, through which projects an arm 26, rigidly secured to the presser-foot bar 20. The arm 26 is pivoted to the lower end of a link 27, which is in turn pivoted to the end of a crank 28, adjustably

secured to the outer end of a rock-shaft 29, journaled in the sewing-machine arm and extending parallel to the shaft 13.

44 is a cam-finger journaled upon a bracket-arm 45, adapted to engage the arm 26 for elevating the presser-foot bar 20 against the tendency of its spring 21.

30 is a rocker-arm keyed to the rock-shaft 29, inside of the arm 4, and 31 is a cam secured to shaft 13 and adapted to rock the arm 30 and shaft 29 for intermittently elevating the presser-foot 22.

35 represents a shuttle, which may be of any suitable construction. I have represented an oscillatory shuttle driven by a shaft 36 and connected by crank-arm 37 and strap 38 with an eccentric 39, keyed to the shaft 13, by means of which the shuttle is given a regular oscillatory motion.

The machine-table is formed in two parts with a free and unobstructed transverse slot or cloth-opening between them, extending from side to side of the machine-table to allow the insertion of a piece of work from either side. To arrange the machine-table in this manner, I provide an auxiliary frame 50 of substantially U shape. This frame 50 has a horizontal portion 50<sup>a</sup> extending toward the center of the machine and rising vertically to form an arm 50<sup>b</sup>, which is rigidly secured or formed integral with a bracket or casting 51, secured to the main machine-frame directly beneath the sewing-machine arm 4. The U-shaped frame 50 has a forward arm 50<sup>c</sup> extending vertically and formed with a socket 52 in its upper end, in which is adjustably mounted an arm 53, which is formed with a horizontal projection 54, extending toward the central plane of feed of the machine.

55 is a set-screw for holding the arm 53 in any desired adjusted position.

56 is a head secured to the end of the horizontal arm 54 and formed with a guide slot or groove 56' in its upper face, in which slides a guide-plate 57, secured to the lower face of the auxiliary feed-plate or cloth-plate 58, forming part of the machine-table.

59 is an adjusting-screw loosely engaging the bracket 60 of the guide-plate 57 and threaded into the head 56 of arm 54, by which means the auxiliary feed-plate 58 can be adjusted toward or away from the stationary part 3 of the machine-table.

The forward edge of the auxiliary feed-plate 58 has set into it a small guide-roller 65, which is journaled freely therein for guiding the cloth around the end of the feed-plates. The roll 65 is formed with a series of cloth-engaging points or pins 67, arranged around its periphery at its ends. The points or pins 67 serve to hold the cloth to prevent its stretching in either direction while the needle is penetrating. In some cases it is unnecessary to provide the needle-guide roller 65 with the cloth-engaging points 67, and in such cases I have a plain grooved roller. This plain roller is not illustrated in the drawings, because its

structure will be perfectly clear from the above explanation.

70 is a grooved rubber-faced feed-roll freely journaled in the arms 71, rigidly secured to and depending from the under face of the adjustable feed-plate 58.

73 is a vertically-movable head or support resting against the forward face of the arm 50<sup>b</sup> and carrying the parallel rods 74, which depend from it and extend through the perforated guide-plates 75, secured to said arm 50<sup>b</sup>.

76 are spiral springs surrounding the rods 74 and engaging the lower guide-plate 75 at their lower ends and a pin 77 at their upper ends, which pin 77 passes through the rods 74. Springs 76 tend to hold the head or support 73 upwardly with a yielding pressure.

The head 73 is bifurcated or provided with two bearing-arms 73<sup>a</sup>, in which is freely journaled the rubber-faced feed-roll 78. Keyed to the journal 79 of feed-roll 78 is a small ratchet-wheel 80, and mounted upon one of the bearing-arms 73 is a spring retaining-pawl 81, in constant engagement with the ratchet-wheel 80 for holding the roll 78 against backward rotation.

82 is an oscillatory arm freely journaled upon the journal 79 and formed with a heel 83.

84 is a spring-pawl secured to the heel 83 of oscillatory arm 82 and having its spring-tooth in engagement with the ratchet 80 in rear of the stationary retaining-pawl 81.

85 is a lever pivoted at 86 and connected at its lower end 87 with a link 88, which is in turn pivoted to the oscillating arm 82. The upper end of the lever 85 carries an antifric-tion-roll 89, which works upon the face of a cam 90, keyed to the shaft 13. By the rotation of the shaft 13 the cam 90 imparts a regular oscillating motion to the arm 82, which causes the feed-roll 78 to rotate forwardly step by step.

91 is a rock-arm connected rigidly to the lever 85 and extending forwardly through a vertical slot 92, formed in the sewing-machine arm 4.

93 is an adjustable plate mounted upon a pin 94 and formed with a series of notches in its edge, which notches gradually increase in depth from one end of the series toward the other end.

95 is a thumb screw or nut engaging the threaded portion of the pin 94 and adapted to clamp the plate 93 in any desired adjusted position.

It will be clear that the purpose of the notched plate 93 is to engage the projecting end of arm 91 to limit its upward movement and thereby control the nearness of the antifric-tion-roll 89 to the face of cam 90. This will regulate the length of the stroke of the oscillating pawl-carrying arm 82, and consequently the length of feed and the stitches taken in the material which is being sewed. I prefer to form the plate 93 in the shape of a segment, as shown, and arrange five notches in its edge, which will differ sufficiently in

depth to make a change of one tooth of ratchet-wheel 80 in the amount of feed imparted to the feed-roll 78. In this way I can impart a feeding stroke amounting to one tooth of the ratchet or to five teeth of the ratchet, which I have found to be sufficient for all practical purposes.

It will be observed that the head 73 under the influence of spring 76 will hold the rubber-faced feed-roll 78 into peripheral contact with the companion feed-roll 70. To throw the feed-rolls apart, I provide a long lever 96, which is pivoted at 97 and formed with the slot 98 at its forward end, engaging a stud 99, projecting from one face of the head 73.

100 is a treadle journaled between the side frames 1 and 2, and 101 is a connecting-rod connecting the treadle 100 with the lever 96. By the depression of the forward end of treadle 100 the feed-rolls 78 are moved apart to facilitate the insertion of the goods between their upper faces.

It sometimes occurs in sewing a number of thicknesses of goods that the needle is forced a little out of line before it enters the shuttle-case. This sometimes results in the breaking and bending of needles. To prevent such accidents, I provide small lever 105, pivoted to the sewing-machine table between lugs 106 and carrying in its forward bifurcated end a small needle-guide roller 107. This needle-guide roller 107 is preferably formed with a central peripheral groove to properly guide the point of the needle into the opening 108 of the shuttle-case 109. When it is desired, the lever 105 may be thrown back out of operative position. When in operation, the roll 107 is supported upon the shuttle-case 109.

115 is a rod projecting from the arm 53 and supported at its other end in a bracket 116, which depends from the head 56. Journaled upon the rod 115 is a tubular roller 117, carrying at one end a small pulley or drum 118, upon which is wound a band or tape 119, provided at its free end with hooks or other fastening devices 120. Coiled around the rod 115, within the tube 117, is a spiral spring 121, one end of which is secured to the rod 116, while the other end is attached to the tubular roller 117, giving said roller a tendency to wind the tape 119 around the drum 118. The purpose of this device is to start the material over the feed-plate and into the bite of the feed-rolls 70 and 78.

It will be observed from the above description that the supports for my improved cloth-supporting plate, together with the other operative parts of the machine, are so disposed that they will permit the free and unobstructed insertion of the work from either side of the machine.

The operation of my improved machine may be described as follows: 157, 157<sup>a</sup>, and 157<sup>b</sup> represent, respectively, a piece of cloth, a lining, and a wadding which are being sewed together with my improved blind-stitching-machine. The materials may be

inserted by drawing the tape 119 between the rolls 70 and 78 and hooking the hooks 120 in the forward edges of the several pieces, then allowing the material to slide forward and around the inner edge of the feed-plate, the tension of spring 121 winding the tape 119 around the drum 118. As soon as the edge of the material reaches the end of the feed-plate the machine may be started to sew from the extreme forward edge, the pull of the feed-tape 119 being limited by the regular feed of the roll 78. This will pull the material between the feed-rolls 70 and 78. If a circular piece of work is being sewed, the treadle 100 is depressed for throwing the rolls 70 and 78 apart and the material is inserted from either side, according to convenience. In either case the material is caused to pass inwardly over the feed-plate toward the path of the needle, then downwardly through the feed-opening between the two parts of the machine-table, folding or bending transversely to the direction of feed while in the path of the needle, and then moving in a reverse direction outwardly from the path of the needle. The material falls naturally into the lap of the operator, who sits close up to the machine with his knees alongside of the U-shaped frame 50. By the operation of the feed-screw 59 feeding-plate 58 may be adjusted inwardly toward the path of the needle or backwardly therefrom to cause the needle to pass through more or less of the thickness of the material. In sewing the three thicknesses, as illustrated in the drawings, the needle always passes completely through the lining and wadding and only partially through the thickness of the cloth.

The adjustment of arm 53 in socket 52 enables the vertical adjustment of the feed-plate to suit varying requirements. The adjustment of arm 28 on rock-shaft 29 serves to regulate the position, operation, and pressure upon the presser-foot 22.

It will be observed that the result of blind-stitching with my improved machine is a single line of stitching on the lining side of the work, because the cloth is bent or folded transversely to the line of feed, whereas with the ordinary blind-stitching attachments for sewing-machines in which the cloth is bent longitudinally of the line of feed the result is two lines of stitching.

In Figs. 6 and 7 I have shown sectional views of the stitching. *a* is the needle-thread, and *b* is the shuttle-thread. The needle-thread *a* passes entirely through the lining and wadding and partially through the cloth or fur, which are bent transversely over the end of the feed-plate, when the shuttle passes between the needle and needle-thread and the needle returns to initial position above the cloth, forming the ordinary lock-stitch. As soon as the needle has been withdrawn from the material the latter is fed forward a step for a new stitch, which is performed in the same way. *a'* are the loops made by the

needle-thread around the shuttle-thread *b*. A single exposed portion *a*<sup>2</sup> of the needle-thread will be visible on the lining between every two points of penetration of the needle and  
 5 a single exposed portion of the shuttle-thread will appear between every two loops *a*'. The lining will therefore show a single line of stitching which, if examined closely, will prove to consist of the loops *a*' and the ex-  
 10 posed portions *a*<sup>2</sup> of the needle-thread and the exposed portions of the shuttle-thread *b*. The successive needle-punctures may coincide or they may fall short of or overlap each other, this being dependent upon the feed,  
 15 which determines the length of the stitches.

In my application filed June 23, 1896, Serial No. 596,594, for improvements in sewing-machines, I have described and claimed a machine which works upon the same general  
 20 principle as my present case, but differs from the present case in that it employs an endless feed-belt and peculiar operating mechanism therefor.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. A sewing-machine comprising stitch-forming mechanism, a cloth-supporting plate consisting of two parts separated in the path  
 30 of the needle and forming a transverse opening extending from side to side of the machine, the supports for said cloth-plate and the other operative parts of the machine being disposed to permit the free and unobstructed  
 35 insertion of the work from either side of the machine, and mechanism for feeding the work transversely to and into said opening; substantially as set forth.

2. In a sewing-machine, the combination of  
 40 an approximately U-shaped frame, with suitable stitch-forming mechanism, a cloth-supporting plate formed in two separate parts mounted respectively upon the arms of said  
 45 U-shaped frame, and the two parts of the plate being supported by said frame to form a free and unobstructed cloth opening or slot between them in the path of the needle, which  
 50 cloth-opening extends transversely to the direction of feed of the cloth and from side to side of the machine to permit insertion of the cloth from either side, and suitable cloth-feeding mechanism, substantially as set forth.

3. In a sewing-machine, the combination with suitable stitch-forming mechanism, of a  
 55 cloth-supporting plate formed in two parts, an approximately U-shaped supporting and connecting frame arranged at one side of the machine, and having arms extending toward the plane of feed, the arms of said U-shaped  
 60 frame being connected respectively with the two parts of the cloth-supporting plate and supporting said parts in proper relation to form a free and unobstructed cloth-opening  
 65 between them in the path of the needle extending transversely to the direction of cloth-feed from side to side of the machine, and

suitable cloth-feeding mechanism; substantially as set forth.

4. In a sewing-machine, the combination with stitch-forming mechanism, a machine-  
 70 table, and a machine-supporting frame, of an auxiliary approximately U-shaped frame having one of its arms secured to the main supporting-frame, an auxiliary cloth-plate supported upon the other arm of said U-shaped  
 75 frame to form a part of the machine-table with a free and unobstructed transverse opening between the cloth-plate and machine-table, and suitable means for feeding cloth over  
 80 said cloth-plate into the cloth-opening, as set forth.

5. In a sewing-machine, the combination with stitch-forming mechanism, and a machine-supporting frame, of an auxiliary approximately U-shaped frame arranged at one  
 85 side of the machine and having arms extending toward the plane of feed, one of which arms is secured to the machine-supporting frame, an auxiliary feed-plate or cloth-plate supported upon the other arm of said auxil-  
 90 iary frame adjacent to and forming part of the machine-table, the machine-table and cloth-plate being separated to form a cloth-opening between them in the path of the needle, and suitable cloth-feeding mechanism; 95  
 substantially as set forth.

6. In a sewing-machine, the combination with stitch-forming mechanism, a machine-  
 100 table, and a machine-supporting frame, of an auxiliary U-shaped frame supported upon the machine-frame by one of its arms, a vertically-adjustable arm mounted upon the other arm of said U-shaped frame and carrying an auxiliary cloth-plate forming a part of the  
 105 machine-table, whereby said auxiliary cloth-plate may be adjusted vertically with relation to the machine-table, and suitable cloth-feeding mechanism, as set forth.

7. In a sewing-machine, the combination with stitch-forming mechanism, a machine-  
 110 table, and a machine-supporting frame, of an auxiliary approximately U-shaped frame secured to the machine-supporting frame, a vertically-adjustable arm mounted upon said auxiliary frame, an auxiliary cloth-plate  
 115 mounted upon said vertically-adjustable arm and supported thereby adjacent to the machine-table with a transverse unobstructed cloth-opening extending between them from side to side of the machine, means for adjust-  
 120 ing the auxiliary plate toward and away from the stitch-forming mechanism, and a suitable cloth-feeding device, as set forth.

8. In a sewing-machine, the combination of stitch-forming mechanism, a sewing-machine  
 125 table, an adjustable cloth-plate projecting toward the edge of the machine-table and forming between them a cloth-opening in the path of the stitch-forming mechanism, extending from side to side transversely of the machine,  
 130 means for adjusting the cloth-plate toward and away from the stitch-forming mechanism,

and suitable feeding mechanism constructed to feed cloth over the adjustable plate around its end and down into the cloth-opening; substantially as set forth.

5 9. A sewing-machine comprising stitch-forming mechanism, a cloth-supporting plate consisting of two parts separated in the path of the needle and forming a transverse opening extending from side to side of the machine, a guide-roll journaled in one of said parts, and cooperating feed-rolls for feeding cloth over and under said part of the feed-plate in which the guide-roll is journaled, causing the cloth to pass toward and away from the point of stitching, substantially as set forth.

10. A sewing-machine comprising stitch-forming mechanism, a cloth-supporting plate consisting of two parts separated in the path of the needle and forming a transverse opening extending from side to side of the machine, a guide-roll journaled in the forward edge of one of said parts in advance of the plane of the needle of the stitch-forming mechanism, and means for feeding the cloth over and under said guide-roll and part of supporting-plate in which it is journaled, toward and away from the point of stitching, substantially as set forth.

11. In a sewing-machine, the combination of stitch-forming mechanism, a feed or cloth plate projecting toward the point of stitching, a rubber-faced feed-roll journaled beneath the feed-plate, a cooperating rubber-faced feed-roll journaled in a movable spring-pressed support, and means for intermittently operating said feed-rolls; substantially as and for the purposes set forth.

12. In a sewing-machine, the combination of a stitch-forming mechanism, a feed-plate projecting toward the point of stitching, a feed-roll journaled beneath the feed-plate, a movable head or support mounted below said feed-roll, a cooperating feed-roll journaled in said movable head, springs for holding said head in elevated position, an operating-lever engaging said head for depressing it and throwing the feed-rolls apart, and means for operating the feed-rolls, substantially as and for the purpose set forth.

13. In a sewing-machine, the combination of stitch-forming mechanism, a feed-plate projecting toward the point of stitching, a suitable vertically-movable spring-pressed head or support mounted below the feed-plate, a feed-roll journaled in said head or support, a cooperating feed-roll journaled in stationary bearings, a presser-foot, means for elevating and lowering the presser-foot, means for intermittently operating the feed-rolls when the presser-foot is elevated, and means for depressing the movable head or support to throw the feed-rolls apart; substantially as set forth.

14. In a sewing-machine, the combination of stitch-forming mechanism, a feed-plate projecting toward the point of stitching, a feed-roll journaled beneath the feed-plate, a vertically-movable head carrying a second feed-roll, springs moving said head upwardly, a lever engaging said head, and a foot lever or treadle connected with said lever, means for operating the feed-rolls, substantially as set forth.

15. In a sewing-machine, the combination of stitch-forming mechanism, a pair of feed-rolls adapted to engage and feed a piece of cloth between them, a ratchet-wheel carried by one of the feed-rolls, an oscillatory arm carrying a pawl engaging said ratchet-wheel, a cam, a lever connected with said oscillatory arm and engaging and operated by said cam, an arm projecting from said lever, and an adjustable notched plate adapted to engage said arm for regulating the stroke of the pawl; substantially as set forth.

16. In a sewing-machine, the combination of stitch-forming mechanism, a feed-plate projecting toward the point of stitching, a spring-actuated roller beneath the feed-plate, a tape wound upon said roller and provided with cloth-engaging means, said tape being adapted to be passed around the end of the feed-plate and attached to the cloth and feed it over and around the end of the plate, substantially as and for the purposes set forth.

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