

No. 666,391.

Patented Jan. 22, 1901.

E. W. OPPENHEIM.

BLINDSTITCHING SEWING MACHINE.

(Application filed Feb. 5, 1897.)

(No Model.)

4 Sheets—Sheet I.

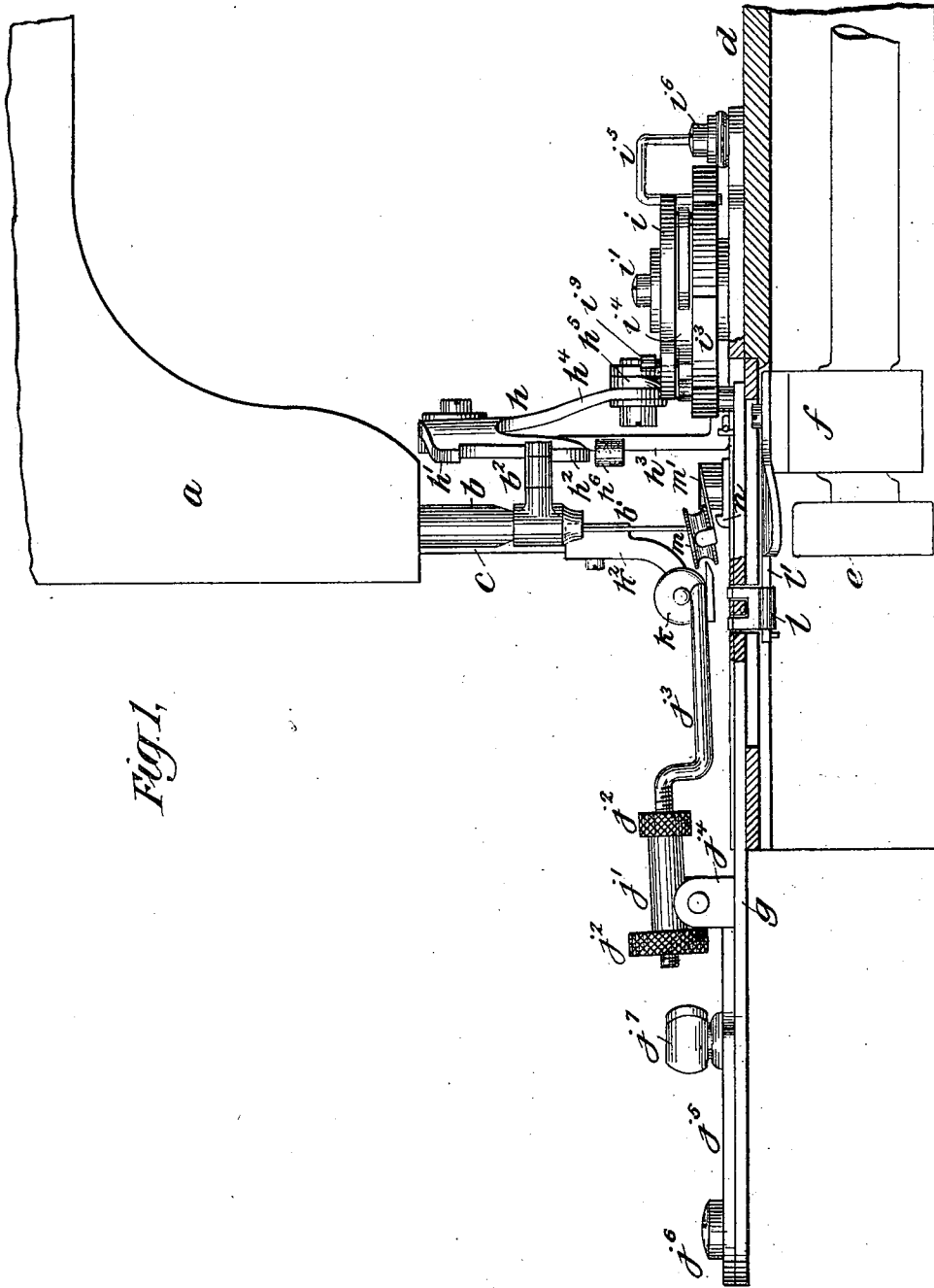


FIG. 1.

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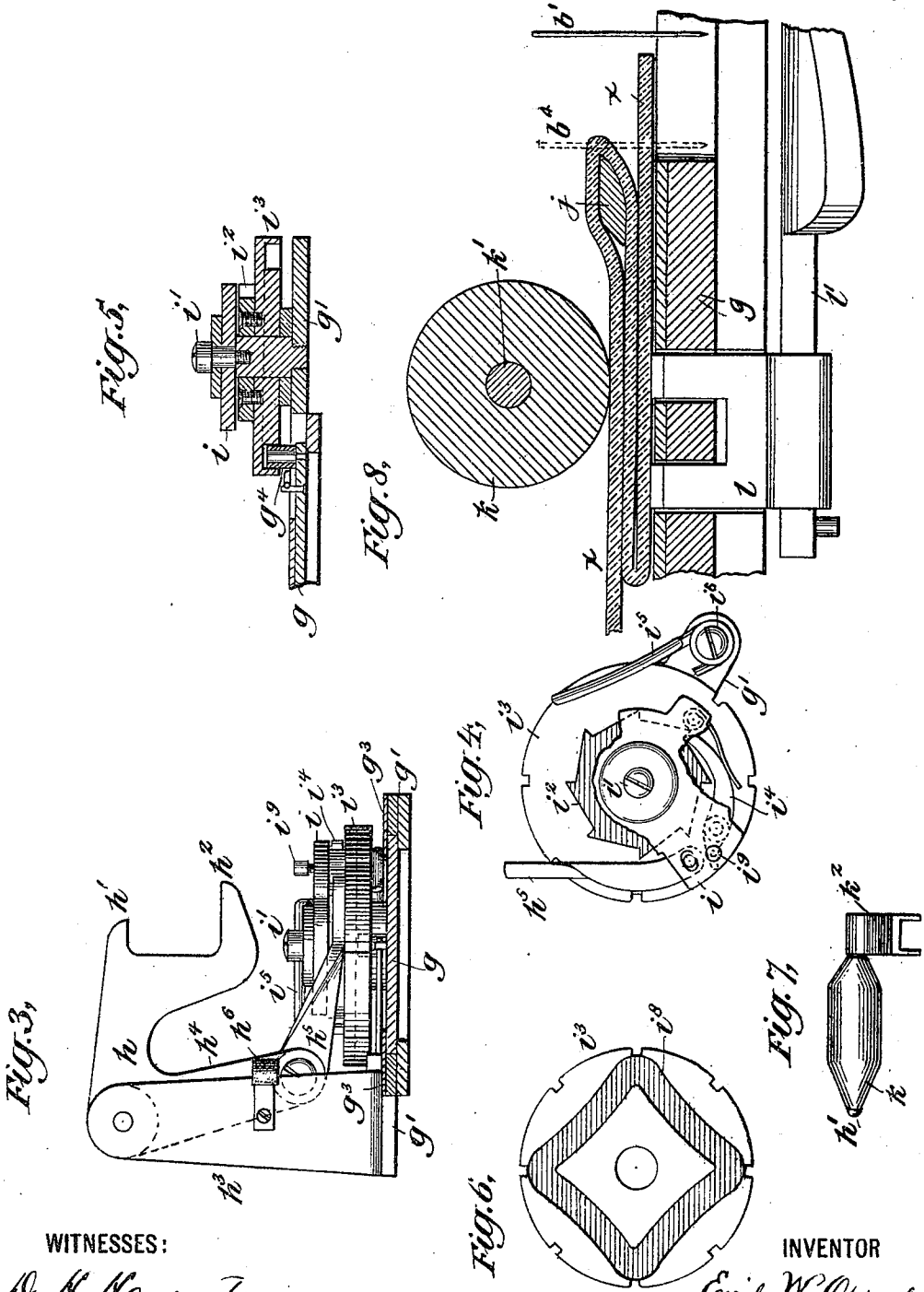
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4 Sheets—Sheet 3.



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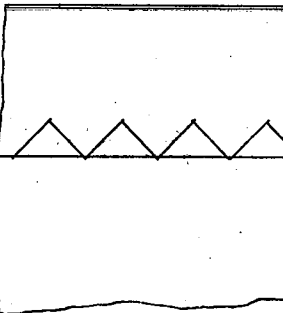
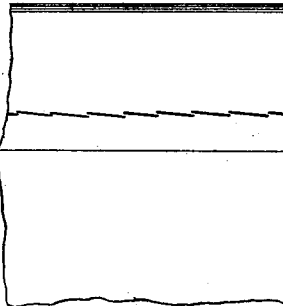
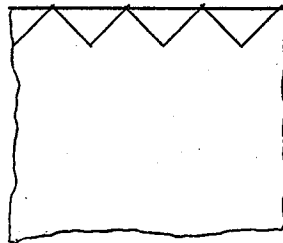
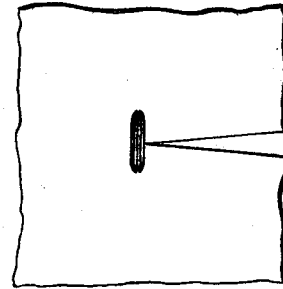
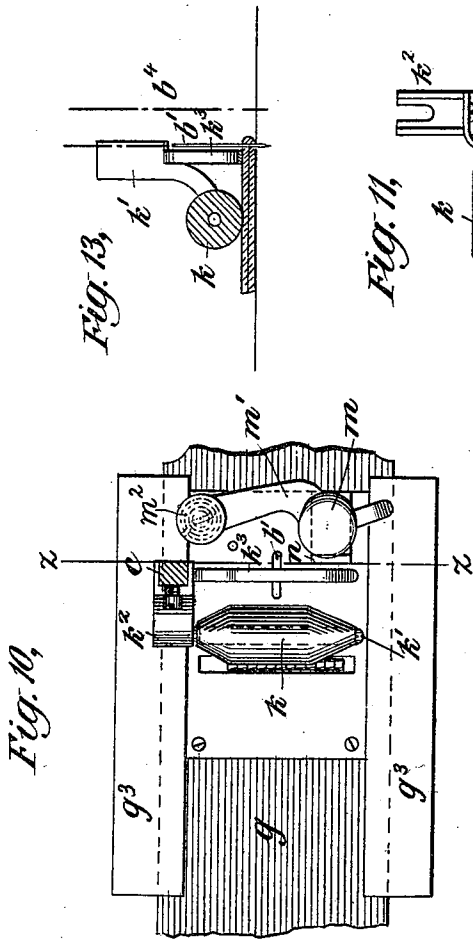


Fig. 14.

Fig. 12.

Fig. 9a.

Fig. 9.

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BLIND-STITCHING SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 666,391, dated January 22, 1901.

Application filed February 5, 1897. Serial No. 622,145. (No model)

To all whom it may concern:

Be it known that I, EMIL W. OPPENHEIM, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Sewing-Machines for Blind-Stitching, Serging, &c., of which the following is a specification.

This invention relates to sewing-machines, and has for its object to provide means adapted for blind-stitching, for serging, for blind-stitching and serging, and for tacking, hemming, felling, &c.

The device embodying my invention may be constructed as an integral part of a sewing-machine or as an attachment capable of being applied to an ordinary sewing-machine and is shown in the accompanying drawings, forming part hereof, and is hereinafter particularly described as an attachment.

My invention includes various features, which will be evident from the following description and are particularly set forth in the claims.

The accompanying drawings illustrate my invention as embodied in a structure capable of being attached to an ordinary sewing-machine.

Figure 1 is a front elevation, partly in section, showing the attachment and portions of the standard, table, and other parts of the sewing-machine. Fig. 2 is a plan view of the same with the standard, needle-bar, and presser-foot bar removed. Fig. 3 is an elevation of the attachment in section on the line 3-3, Fig. 2. Fig. 4 is a plan view, partly in section, of the pawl and ratchet, stop, and cam-wheel for reciprocating the cloth-carrier. Fig. 5 is a vertical section of the same, taken through the axis of the cam-wheel, and also shows the right-hand portion of the cloth-carrier and cam-roller carried thereby. Fig. 6 is an underneath plan view of the cam-wheel detached. Fig. 7 is a detached plan view of the roller presser-foot. Fig. 8 is an enlarged vertical section of the cloth-guide, roller presser-foot, feed and cloth carrier, taken on the line of the needle and showing the goods in position for blind-stitching. Fig. 9 is a detached face view, enlarged, of the inside of the sewed goods after the combined serging and blind-stitching operation illustrated in

Fig. 8. Fig. 9^a is a similar view of sewed goods with the plain or straight blind-stitch. Fig. 10 is a part plan view, with presser-foot bar in section and standard and needle-bar removed, showing an additional or supplementary presser-foot for serging. Fig. 11 is a detached rear elevation of the main and supplementary presser-foot shown in Fig. 10. Fig. 12 is a face view, enlarged, of the goods sewed with the serging-stitch. Fig. 13 is an enlarged vertical section of the roller presser-foot and supplemental presser-foot, taken on the line of the needle and showing the goods in position for tacking. Fig. 14 is a face view, enlarged, of goods sewed with the tacking-stitch.

The parts of an ordinary sewing-machine illustrated include a standard *a*, a needle-bar *b*, and a needle *b'*, a presser-foot bar *c*, a bed or table *d*, a rotary shuttle *e*, and a feed-carrier *f*. These parts are of ordinary construction and need not be particularly described. As shown, the needle-bar has a horizontally-extending part or stud *b''*, including the head of the screw for clamping the needle *b'*, which screw would be longer than usual, as shown, to provide actuating means for the mechanism embodying my invention for imparting a reciprocating movement to the goods across the direction of feed, and the table *d* has an opening to receive the cloth-carrier and guides therefor and other parts embodying my invention; but such an opening may usually be obtained by the removal of the detachable parts of the table.

The cloth-carrier above referred to comprises a plate *g*, fitted in guides so as to be capable of a reciprocating movement across the direction of feed, this plate *g* forming a transversely-reciprocating part of the table and supporting the goods about the needle, and having an elongated slot formed therein to receive the needle in all positions occupied by the cloth-carrier. The guides for the plate *g* are shown as formed in a base-plate *g'*, which fits into the opening in the table and is firmly secured, as by screws *g'' g''*, to some suitable part of the machine, in this case part of the frame which supports the table *d*. The guides are shown as formed by depressions or grooves formed in the base-plate *g'* and by plates *g''' g'''*, screwed to the base-

plate and overlapping the edges of the cloth-carrier.

The means for imparting reciprocating movement to the cloth-carrier are actuated by the needle-bar through the stud or screw-head b^2 , above referred to, projecting from the needle-bar, which engages alternately with the upper and lower arms h^1 and h^2 of the forked end of the upper arm of a two-armed or bell-crank lever h , (see Fig. 3,) and thus imparts an oscillating movement to the bell-crank lever, the arms h^1 and h^2 being spaced apart sufficiently to allow of the withdrawal of the needle from the work before the commencement of the movement of the cloth-carrier. The bell-crank lever h is pivoted upon a standard h^3 , extending up from the base-plate g' , this standard being secured to or forming part of said plate g' , and a suitable stop, as h^6 , upon the standard h^3 limits the downward movement of the bell-crank lever by contact with the bell-crank lever near the arm h^2 . The lower arm h^4 of the bell-crank lever is connected by a twist-link h^5 to an oscillating plate i , movable on a vertical axis, the link having a slotted connection with the oscillating plate to allow for the circular movement of the oscillating plate. The oscillating plate i is fitted loosely upon a stud i^1 , extending upward from and secured to or forming part of the base-plate g' , and, as shown, this stud is in two parts, the upper part forming the journal for the oscillating plate i and being screwed to the lower part. (See Fig. 5.) Upon the stud i^1 below the oscillating plate i are loosely mounted the ratchet-wheel i^2 and cam-wheel i^3 , shown as of two pieces screwed together, but which may be otherwise secured together or in one piece. The oscillating plate i imparts motion to the ratchet and cam wheels through a spring-pawl i^4 , pivoted to the oscillating plate i and engaging with the teeth of the ratchet-wheel i^2 , (see Fig. 4,) each forward stroke of the oscillating plate i causing the ratchet-wheel to move forward one tooth. A stop is provided to restrain the forward movement of the cam and ratchet wheels and to prevent backward movement thereof, consisting of the spring locking-piece i^5 , shown as of wire, secured to the base-plate g' by a screw i^6 and extending upward and horizontally and at its outer end bent downward and adapted to enter any one of a series of depressions or grooves formed in the outer periphery of the cam-wheel i^3 .

The forward movement of the oscillating plate i and consequent actuation of the cam and ratchet wheels through the engagement of the pawl i^4 and one of the ratchet-teeth bring the cam and ratchet wheels into position for the locking-piece i^5 to enter one of the grooves of the cam-wheel, and the locking-piece holds the cam and ratchet wheels stationary during the backward movement of the oscillating plate i and pawl i^4 . As the oscillating plate approaches its extreme rearward position a cam i^7 formed upon the os-

cillating plate i (see Fig. 2) engages with the locking-piece i^5 and pushes it outwardly, but preferably not sufficiently to entirely disengage the locking-piece, so that at the termination of the backward movement of the oscillating plate and at the commencement of the forward movement thereof the locking-piece but lightly restrains the ratchet and cam wheels, and the ratchet and cam wheels are therefore in condition to be readily moved forward by the pawl i^4 and are moved forward by the pawl upon the forward movement of the oscillating plate.

The cam-wheel i^3 is provided with a cam-groove i^8 (see Fig. 6) at the lower face thereof, and in this groove works a cam-roller g^4 , fitted to rotate on a stud projecting upward from the cloth-carrier g at the right-hand end thereof. From the shape of the cam-grooves i^8 it will be observed that each step forward of the step-by-step movement of the cam and ratchet wheels will cause a complete movement of the cloth-carrier in one direction and that the movements will be alternately in opposite directions. Comparing the movements of the cloth-carrier as effected by the mechanism above described to that of the needle, it will be seen that during each downstroke of the needle the cloth-carrier is at rest and that during each upstroke of the needle a movement of the cloth-carrier occurs, alternate movements being in opposite directions, and that therefore the needle will at alternate movements occupy different positions transversely of the direction of feed relatively to the cloth-carrier.

To insure exact registering of the cloth-carrier in both extreme positions and to take up the slight looseness of fit of the cam-roller g^4 within the cam-groove i^8 , a spring g^5 is provided, suitably secured to the base-plate g' and bearing against a stud or shoulder of the cloth-carrier g , this spring holding the cam-roller against the outer face of the cam-groove i^8 when the cloth-carrier is at rest in either position. It is to be observed, however, that this spring g^5 is not relied upon to compel the movement of the cloth-carrier in either direction, as the cam is a positive one, compelling movements in both directions.

In blind-stitching the thread should enter the outer goods sufficiently to be held therein, but should not pass entirely through the goods or be visible at the outer side of the goods. To permit the needle to pass through the goods without reaching the outer side thereof, the goods are folded at the part to be stitched and placed over a guide j of my invention. This guide is an open guide having an opening therein to permit without interference or substantial interposition the action of the feed-piece and presser-foot upon the folded goods. Fig. 8 illustrates the relative positions of the folded goods x , the needle b' , the guide j , the presser-foot k , which according to my invention is a roller presser-foot, as will be hereinafter described, and of the feed-piece

l, which reciprocates with the cloth-carrier, as will be hereinafter described. The needle is shown passing through the outer goods, but at a sufficient distance from the outer surface thereof to insure a concealed or blind stitch, and as passing through the inner part of the fold of the goods, the fold shown being such as is employed in sewing the bottoms of trousers.

The guide *j* is shown as a light frame having a curved outer longitudinal edge in proximity to the needle and having two transverse bent legs $j^3 j^3$, shown as of wire, these transverse legs $j^3 j^3$ at their left-hand ends entering guides or perforations formed upon or in the pivoted plate *j'* and threaded and engaged by the adjusting-nuts $j^2 j^2$, two of such nuts being provided for each leg, so that each leg may be tightly held in the position to which it is adjusted. The plate *j'* is pivoted upon a horizontal axis, and thus the guide *j* may swing in a vertical plane and will adjust itself to varying thicknesses of goods and may be swung upward to facilitate the placing of the goods over the guide. For greater convenience in adjusting the goods I also provide for swinging the guide *j* in a horizontal plane, although in some cases this movement in a horizontal plane may not be required and the means therefor omitted. The plate *j'*, which carries the guide *j*, is shown as pivoted on a horizontal axis by a pivot-pin passing through lugs $j^4 j^4$, extending upward from a plate j^5 , resting upon the cloth-carrier *g*, and the plate j^5 is pivoted on a vertical axis through a suitable pivot j^6 , extending upward from and secured to the cloth-carrier *g*. A stop-pin j^7 , entering a slot in the plate j^5 , serves to limit the rearward movement of the plate j^5 , and is also shown as a thumb-screw whereby the plate j^5 may be tightly clamped in rearward position. The plate j^5 and cloth-guide *j* carried thereby may be swung forwardly in a horizontal plane, so as to be clear of the needle, presser-foot, and adjacent parts when it is desired to place the goods over the guide *j* and may then be swung back into the working position shown.

An auxiliary guide is provided to insure the registering of the goods against the outer edge of the guide *j*, consisting of a spring-pressed grooved part, preferably a grooved roller *m*, as shown, adapted to press upon the outer surface of the fold of the goods around the outer edge of the guide *j* in proximity to the needle, and thus to hold the goods snugly against the guide. The outer edge of the guide is, as before stated, shown as of curved outline and should be shaped so as in advance of the needle to gradually approach a line parallel to the direction of feed and passing through the needle, as the line *yy*, Fig. 2, thereby gradually tightening the goods at the fold as they approach the needle.

The auxiliary guide *m* is located in advance of the needle, and therefore presses the goods against the guide at a portion of the curved

edge of the guide in advance of the needle, thereby causing a contact of the fold of the goods with the guides in advance of the needle and insuring the desired tightening of the goods over the guide at the point of sewing. The guide *j* is shown as of curved outline throughout its working edge, gradually receding from a line parallel to the line of feed in rear of the needle, so as to relieve the tension upon the goods beyond the point of sewing.

The guide *j* has a slight rounded nick or groove alongside of the needle to ease the goods slightly at the point of penetration of the needle. The adjusting-nuts $j^2 j^2$ above referred to permit a fine and delicate adjustment of the guide *j* relatively to the needle, as is desirable and sometimes may be required for varying thicknesses of goods.

The grooved roller *m* is pivoted upon an arm *m'*, and this arm *m'* is pivoted upon the cloth-carrier *g* and pressed forward by a coiled spring m^2 , (see Fig. 10,) within its hub, and projects forward to provide a handle for conveniently manipulating the grooved roller *m*, and when the roller *m* is not in use it is sprung behind a shoulder on the serging-guide *n*, to be hereinafter described, as shown in Fig. 10, this serging-guide *n* being fixed to the cloth-carrier *g*.

The feed-piece *l* is fitted to move across the direction of feed, and to this end is fitted to slide upon a guide-bar *l'*, which may be secured to the feed-carrier, as by a screw, in the same manner as the ordinary feed-piece. The feed-piece *l* has two toothed portions projecting upward through slots in the cloth-carrier *g*, and by reason of this engagement of the feed-piece and cloth-carrier the reciprocating movements of the cloth-carrier are imparted to the feed-piece, and these two toothed portions of the feed-piece *l* are preferably so placed that in the extreme positions of the cloth-carrier one or the other of the toothed portions is directly under the presser-foot. This feed-piece receives the usual up-and-down and backward-and-forward movements from the feed-carrier in addition to the transverse movements imparted to it by the cloth-carrier.

The presser-foot has a curved lower surface and is pivoted upon an axis, so as to roll with the goods as the goods are carried across the direction of feed. It is so shaped as not to interfere with the proper feeding of the goods, the direction of feed being on a line substantially parallel to the pivotal axis of the presser-foot. In the embodiment of my invention shown in the drawings this presser-foot is a roller *k*, pivoted upon a pin *k'*, projecting forwardly from the holding-piece k^2 , the holding-piece k^2 being adapted to be secured to the presser-foot bar *C* in the usual manner, as by the screw shown. The roller presser-foot has such a longitudinal or axial section that the usual configuration in planes parallel to the direction of feed of the lower

face of an ordinary presser-foot is attained—that is to say, the lower surface is mainly straight and curved or extended upwardly at its ends—and this is accomplished in the construction shown by making the roller k medially cylindrical and conoidal at its ends, as shown.

As before stated, the guide j is open and the presser-foot k is located above the opening in the guide and the feed-piece l is located below the opening in the guide, and thus the parts of the folded goods are pressed together by the presser-foot and feed-piece and the feeding forward of the goods is not interfered with by the guide. This is particularly shown in Fig. 8.

The construction above described performs both blind-stitching and serging or sewing over or around the edge of the inturned end or edge of the goods, the goods being adjusted as shown in Fig. 8, the needle b' in one stroke (indicated by dotted lines b^4) passing through the fold and in the next stroke passing down beyond the inturned edge, as shown by the full lines b' , and so on alternately. The sewing thus produced is shown in Fig. 9, the goods having here been pressed flat along the fold which was over the edge of the guide j . Thus the edge of the inturned part is serged and raveling prevented and a zigzag stitch invisible on the outer face of the goods is obtained.

If the device is attached to or embodied in a chain-stitch sewing-machine, the needle should enter the goods at each stroke, and this may be provided for by using a cam in place of the cam v^3 which will cause a smaller movement of the goods or by adjusting the goods so that the edge of the inturned part of the fold will extend to the right a sufficient distance to receive the needle when the goods are in extreme left-hand position. In some cases it may be desirable to produce straight blind-stitching instead of the zigzag or serging blind-stitching above described, and to that end I provide for throwing the pawl v^4 into such position that it will not engage with the teeth of the ratchet-wheel v^2 , and therefore the cam and ratchet wheels will not be actuated, such means being shown as consisting of a pin v^5 , passing downward through the oscillating plate i in such position that when the pawl v^4 is moved back clear of the ratchet-teeth the pin v^5 may be moved down in front of a tailpiece of the pawl and will hold the pawl in such position until disengaged. The cloth-carrier g should be moved to the position shown in Fig. 8 and would there remain at rest, and the needle would pass at every stroke through the fold around the guide j . The character of the stitching thus produced is shown in Fig. 9^a. It is of course evident that this character of sewing could also be performed in a mechanism omitting all means for moving or permitting the movement of the cloth-carrier.

Another character of sewing which may be performed on a sewing-machine embodying

my invention is serging or overedge stitching. To this end the guide j is either swung out of operative position or removed, as may be desired, and the goods rest upon the table or cloth-carrier and are guided by the serging-guide n , heretofore referred to, which is fixed upon the cloth-guide and projects upward and has a smooth guide-surface adapted to guide the edge of the cloth. In addition to the roller presser-foot k , heretofore described, a supplemental presser-foot is provided, consisting of a light spring k^3 , secured to the presser-foot carrier k^2 and pressing lightly upon the goods quite close to the needle and acting to hold the goods down at the point of sewing. This supplemental presser-foot is illustrated in Figs. 10 and 11, the broken lines zz in Fig. 10 indicating the position of the edge of the goods. Fig. 12 shows the goods sewed with this serging-stitch.

Another character of sewing which may be performed on a sewing-machine embodying my invention is tacking or passing a thread or threads backward and forward several times at the same place in the goods to reinforce the goods in proximity to an opening, as for a pocket. To this end it is only necessary to swing the guide j out of operative position, to stop the backward-and-forward movement of the feed-piece, and usually to employ the supplemental presser-foot k^3 , above referred to. Sewing-machines are usually provided with means for adjusting the extent of feed which may be adjusted, so that there will be no feeding movement; but if such means are not provided it will be only be necessary to remove the feed-piece. The tacking-stitching would then be effected by several operations, with the goods folded and placed as shown in Fig. 13, the transverse movement of the cloth-carrier carrying the threads over the surface of the goods as well as through the goods. The completed tacking-stitch thus obtained is shown in Fig. 14.

Other varieties of work may be performed on a sewing-machine embodying my invention, such as hemming, felling, &c., as will be evident to those skilled in the art, and therefore need not be particularly described.

It is of course evident that various modifications may be made in the construction above particularly described, and shown in the drawings, and parts of my invention may be used separately or in combination with other parts of different construction from that shown. I do not therefore limit my invention to the particular construction shown; but

What I claim, and desire to secure by Letters Patent, is—

1. The combination with stitch-forming mechanism of a sewing-machine, including a needle, of a guide constructed to enter a fold of the goods in proximity to the needle and having an opening therein, and a feed-piece and presser-foot oppositely placed respec-

tively below and above said opening in the guide, and means for operating the feed-piece, said opening in the guide being located so as to enable the presser-foot and feed-piece to work therein upon the goods and the guide extending between the needle and feed-piece, and said presser-foot and feed-piece being constructed so as to work in said opening upon the goods, substantially as set forth.

2. The combination with stitch-forming mechanism of a sewing-machine, including a needle, of a feed-piece and presser-foot and a guide, the guide being located on the same side of the needle as the feed-piece and presser-foot and constructed so as to enter a fold of the goods in proximity to the needle and movable across the direction of feed into position such that the edge of the guide will hold the fold of the goods in position to receive the needle and into position such that the bend of the fold will be clear of the needle, the feed-piece and presser-foot being oppositely placed, respectively, below and above the guide, means for actuating the feed-piece and means for moving the guide across the direction of feed, substantially as set forth.

3. The combination with stitch-forming mechanism of a sewing-machine, including a needle, of a guide adapted to enter a fold of the goods in proximity to the needle and having an opening therein, a feed-piece and a presser-foot oppositely placed respectively above and below said opening in the guide, and means for actuating said feed-piece, the outer edge of said guide in advance of the needle gradually approaching a line parallel to the direction of feed and passing through the needle, substantially as set forth.

4. A roller presser-foot for a sewing-machine and means for supporting the same with its pivotal axis substantially parallel to the direction of feed, in combination with feeding and stitch-forming mechanism and means for moving the goods across the direction of feed, substantially as set forth.

5. The combination with stitch-forming mechanism of a sewing-machine, including a needle, of a guide adapted to enter a fold of the goods in proximity to the needle and having an opening therein, a feed-piece below said opening in the guide and a roller presser-foot above said opening in the guide, means for actuating said feed-piece, means for supporting said roller presser-foot with its pivotal axis substantially parallel to the direction of feed, and means for moving the goods across the direction of feed, substantially as set forth.

6. The combination with stitch-forming mechanism of a sewing-machine, including a needle, of a guide adapted to enter a fold of the goods in proximity to the needle and having an opening therein, a feed-piece below said opening in the guide and a roller presser-foot above said opening in the guide and means for actuating said feed-piece, said roller presser-foot having its pivotal axis sub-

stantially parallel to the direction of feed, the outer edge of said guide in advance of the needle gradually approaching a line parallel to the direction of feed and passing through the needle, and means for moving the goods across the direction of feed, substantially as set forth.

7. The combination with stitch-forming mechanism of a sewing-machine, of a feed-piece fitted to move across the direction of feed and also in the direction of feed and means for actuating the same, a presser-foot having a lower surface so shaped that its section in planes substantially at right angles to the direction of feed is an upwardly-curved line and its section in planes substantially parallel to the direction of feed is a line mainly straight but upwardly curved at its ends, and means for pivotally supporting the presser-foot upon an axis substantially parallel to the direction of feed, substantially as set forth.

8. The combination with stitch-forming mechanism of a sewing-machine, including a needle, of a guide adapted to enter a fold of the goods in proximity to the needle and having an opening therein, a feed-piece below said opening in the guide and means for actuating the feed-piece, said feed-piece being fitted to move across the direction of feed and also in the direction of feed and said guide extending between the needle and feed-piece, and a presser-foot above said opening in the guide, and means for moving the goods and feed-piece across the direction of feed, substantially as set forth.

9. A roller presser-foot for a sewing-machine and means for supporting the same with its pivotal axis substantially parallel to the direction of feed, in combination with stitch-forming mechanism, a feed-piece fitted to move across the direction of feed and also in the direction of feed, and means for actuating the feed-piece, substantially as set forth.

10. The combination with stitch-forming mechanism of a sewing-machine, including a needle, of a guide adapted to enter a fold of the goods in proximity to the needle and having an opening therein, a feed-piece below said opening in the guide and means for actuating the feed-piece, said feed-piece being fitted to move across the direction of feed and also in the direction of feed, and a presser-foot above said opening in the guide, said presser-foot having a curved lower surface and pivoted upon an axis substantially parallel to the direction of feed, and means for moving the goods and feed-piece across the direction of feed, substantially as set forth.

11. The combination with feeding and stitch-forming mechanism of a sewing-machine, including a needle, of a guide adapted to enter a fold of the goods in proximity to the needle, an auxiliary guide having a grooved part located in advance of the needle and means for causing said auxiliary guide to exert a yielding pressure upon the outer surface

of the fold of the goods around the edge of the guide in proximity to the needle, substantially as set forth.

12. In a sewing-machine, the combination with stitch-forming mechanism, of a reciprocating cloth-carrier fitted to move across the direction of feed, means for actuating the same, a guide carried by the cloth-carrier and located thereon so that in the rearward position of the cloth-carrier the rear edge of the guide is in close proximity to but in front of the needle, said guide being constructed to enter a fold of the goods and with its rear edge located so as to hold the bend of said fold in position to receive the needle when the guide is in rearward position, a presser-foot above the cloth-carrier, a feed-piece extending up from below the cloth-carrier and protruding through the cloth-carrier and engaged thereby, a carrier for the feed-piece located below the cloth-carrier and means for moving the carrier for the feed-piece in the line of feed, the feed-piece being fitted to slide upon its carrier in the direction of movement of the cloth carrier, substantially as set forth.

13. In a sewing-machine, the combination with feeding and stitch-forming mechanism, of a reciprocating cloth-carrier fitted to move across the direction of feed, means for actuating the same, a pivoted guide carried by the cloth-carrier and movable on a substantially horizontal axis and adapted to enter a fold of the goods in proximity to the needle, and an auxiliary guide having a grooved part and means for causing said auxiliary guide to exert a yielding pressure upon the outer surface of a fold of the goods around the edge of the guide in proximity to the needle, substantially as set forth.

14. In a sewing-machine, the combination with stitch-forming mechanism, of a reciprocating cloth-carrier fitted to move across the direction of feed, means for actuating the same, a guide carried by the cloth-carrier, a roller presser-foot and means for supporting the same with its pivotal axis substantially parallel to the direction of feed, a feed-piece fitted to move across the direction of feed and protruding through the cloth-carrier and engaged thereby, and means for actuating the feed-piece, substantially as set forth.

15. In a sewing-machine, the combination with feeding and stitch-forming mechanism, including a needle-bar, of a lever having a fixed pivotal point and means whereby it may be operated by the needle-bar, an oscillating plate connected to the lever, a pawl carried by said oscillating plate, a ratchet and cam the ratchet whereof is engaged by said pawl, a lock-pawl for said ratchet and cam, a cam upon the oscillating plate engaging said lock-pawl, a cloth-carrier fitted to move across the direction of feed, and engaged by the cam of said ratchet and cam, and a guide carried by said cloth-carrier, substantially as set forth.

16. In a sewing-machine, the combination

with stitch-forming mechanism, including a needle-bar, of a lever having a fixed pivotal point and means whereby it may be operated by the needle-bar, an oscillating plate connected to the lever, a pawl carried by said oscillating plate, a ratchet and cam the ratchet whereof is engaged by said pawl, a lock-pawl for said ratchet and cam, a cam upon the oscillating plate engaging said lock-pawl, a cloth-carrier fitted to move across the direction of feed and engaged by the cam of said ratchet and cam, a feed-piece and carrier, said feed-piece being fitted to slide upon its carrier in a line substantially parallel to the direction of movement of the cloth-carrier and protruding through and engaged by said cloth-carrier, and a presser-foot and means for actuating the feed-piece, substantially as set forth.

17. A work-guide for a sewing-machine comprising the guide j having legs j^1, j^2 , the pivoted plate j' , receiving such legs, and the adjusting-nuts j^3, j^4 , threaded over said legs and bearing against said pivoted plate j' , substantially as set forth.

18. In a sewing-machine, the combination with feeding and stitch-forming mechanism, including a needle-bar, of the oscillating plate i , means for actuating the same from the needle-bar, the pawl i^1 carried by the oscillating plate, the ratchet and cam i^2, i^3 , the ratchet being engaged by said pawl, a lock-pawl for said ratchet and cam, the cam i^4 upon the oscillating plate i engaging said lock-pawl, the cloth-carrier g fitted to move across the direction of feed and the cam-roller g^1 thereon, the cam-roller g^1 engaging the cam of said ratchet and cam, and the spring g^5 acting to press the cam-roller against one of the walls of said cam, substantially as set forth.

19. In a sewing-machine, the combination with feeding and stitch-forming mechanism, of the cloth-carrier g fitted to move across the direction of feed, a cam for actuating the same and means for operating said cam, a cam-roller connected to said cloth-carrier and engaging said cam, the spring g^5 acting to press the cam-roller against one of the walls of said cam, a cloth-guide carried by said cloth-carrier and means for adjusting said guide, substantially as set forth.

20. In a sewing-machine, the combination with feeding and stitch-forming mechanism, of a cam and means for actuating the same, a cloth-carrier fitted to move across the direction of feed and engaging said cam, said cam being provided with faces constructed to cause the cloth-carrier to be positively actuated in both directions, a spring acting to press the cam-engaging part of said cloth-carrier in one direction against the walls of said cam, a guide carried by said cloth-carrier adapted to enter a fold of the goods in proximity to the needle, and means for adjusting said guide, substantially as set forth.

21. The combination with feeding and stitch-forming mechanism of a sewing-machine, including a needle, of a guide adapted to enter a fold of the goods in proximity to the needle, and a spring-pressed grooved roller located in advance of the needle and adapted to bear upon the outer surface of said fold of the goods and to press the goods against the outer edge of the guide, substantially as set forth.

22. The combination with feeding and stitch-forming mechanism of a sewing-machine, including a needle, of a guide adapted to enter a fold of the goods in proximity to the needle, the outer edge of said guide in advance of the needle gradually approaching a line parallel to the direction of feed and passing through the needle, and a spring-pressed grooved roller located in advance of the needle and adapted to bear upon the outer surface of said fold of the goods and to press the goods against the outer edge of the guide, substantially as set forth.

23. In a sewing-machine, the combination with stitch-forming mechanism, including a needle, of the guide *j*, having a curved outer edge, and the grooved roller *m* located in advance of the needle and means for causing said roller to exert a yielding pressure against

the outer surface of a fold of the goods about said guide, substantially as set forth.

24. In a sewing-machine, the combination with stitch-forming mechanism, including a needle, of the guide *j*, having a curved outer edge, and pivoted so as to be movable in a substantially vertical plane, a transversely-reciprocating cloth-carrier carrying said guide, and the roller *m* also carried by said cloth-carrier and means for causing said roller to exert a yielding pressure against the outer surface of a fold of the goods about said guide, substantially as set forth.

25. In a sewing-machine, the combination with feeding and stitch-forming mechanism and means for moving the goods across the direction of feed, of a pivoted presser-foot having a curved lower surface and pivoted so that its lower surface is movable with the goods across the direction of feed, substantially as set forth.

Signed at Boston, in the county of Suffolk and State of Massachusetts, this 30th day of January, A. D. 1897.

EMIL W. OPPENHEIM.

Witnesses:

ISAAC WASHBURN,
P. J. VAUGHAN.