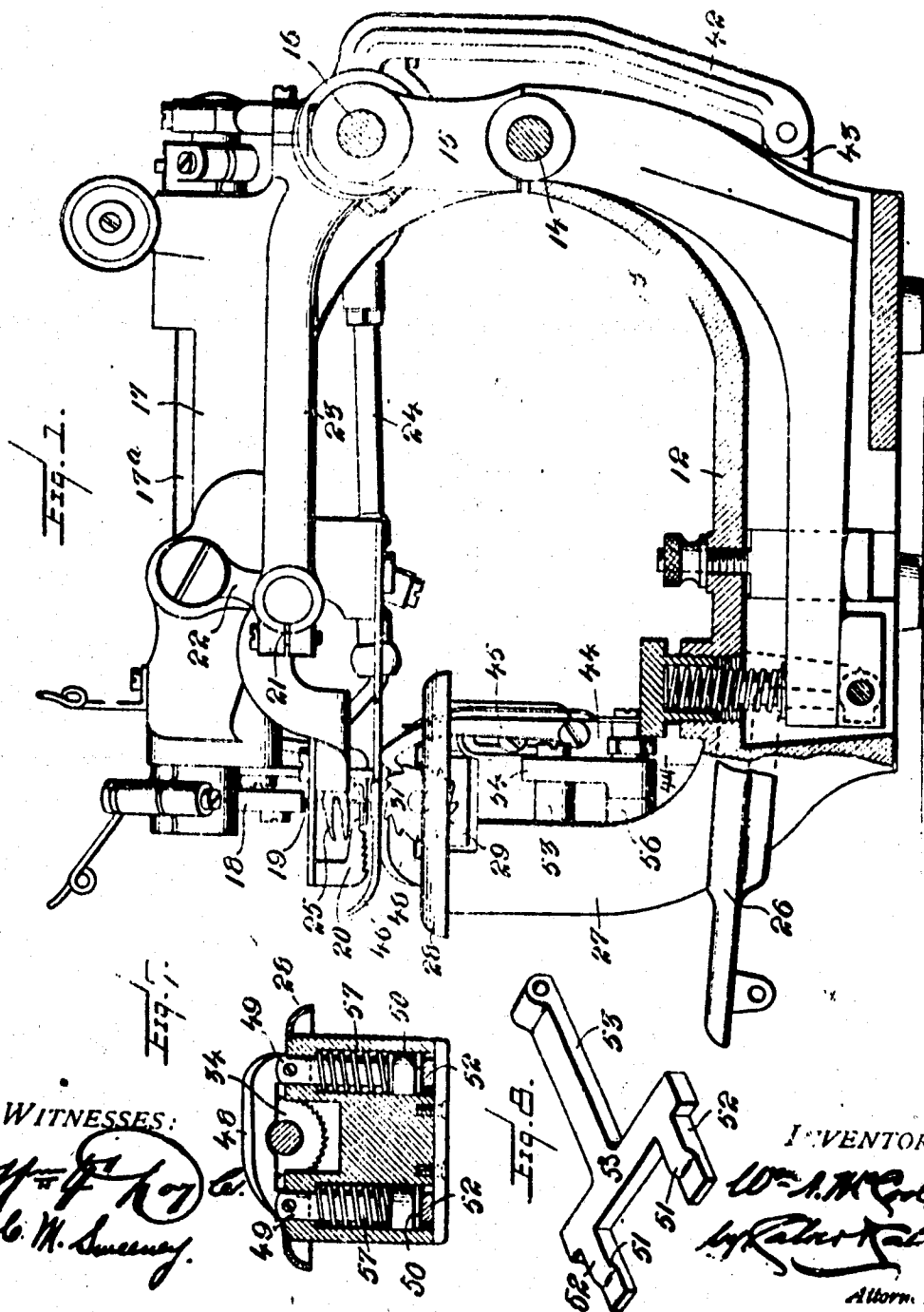


W. A. MCCOOL.
BLINDSTITCH SEWING MACHINE.
APPLICATION FILED MAR. 10, 1909.

983,506.

Patented Feb. 7, 1911

4 SHEETS-SHEET 1



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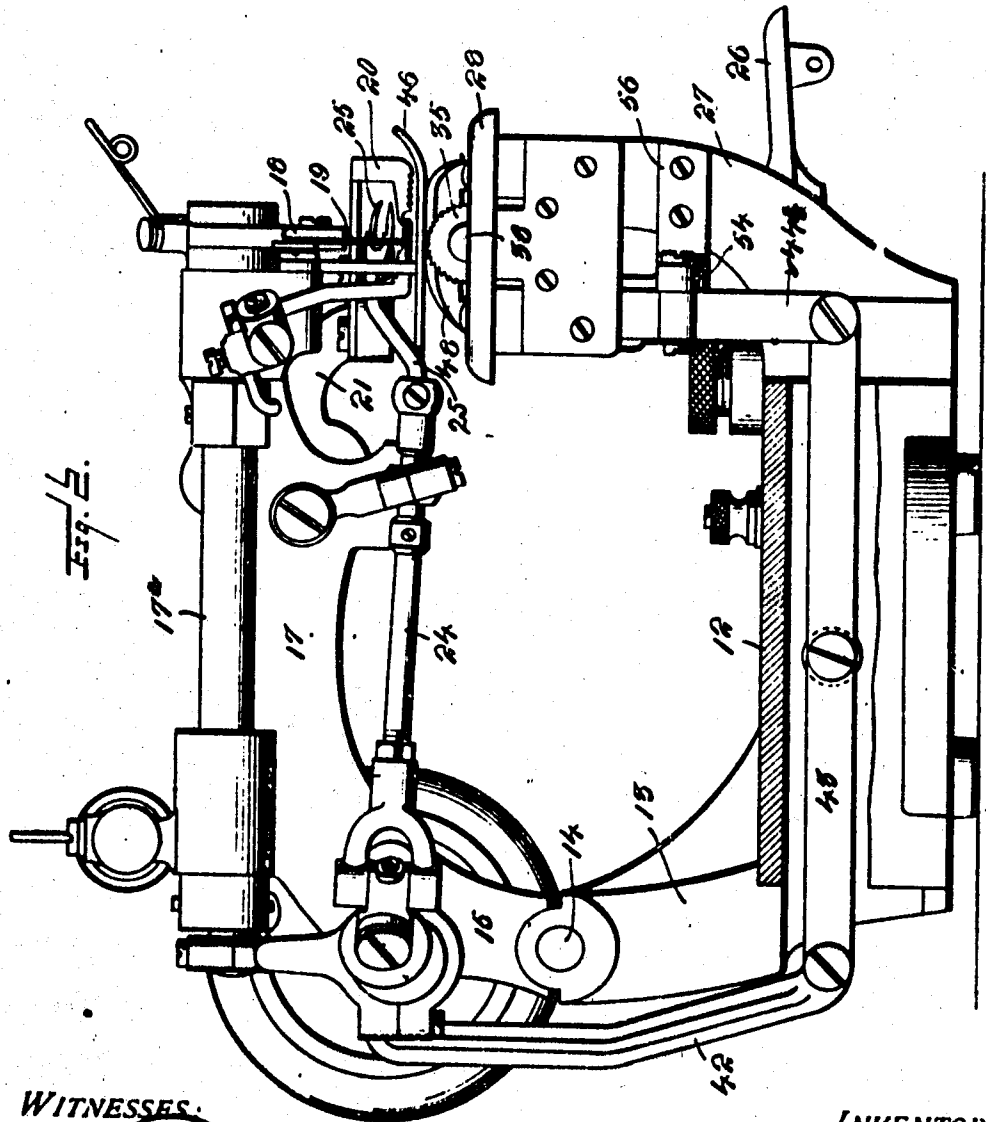
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APPLICATION FILED MAR. 18, 1909.

983,506.

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4 SHEETS-SHEET 2.



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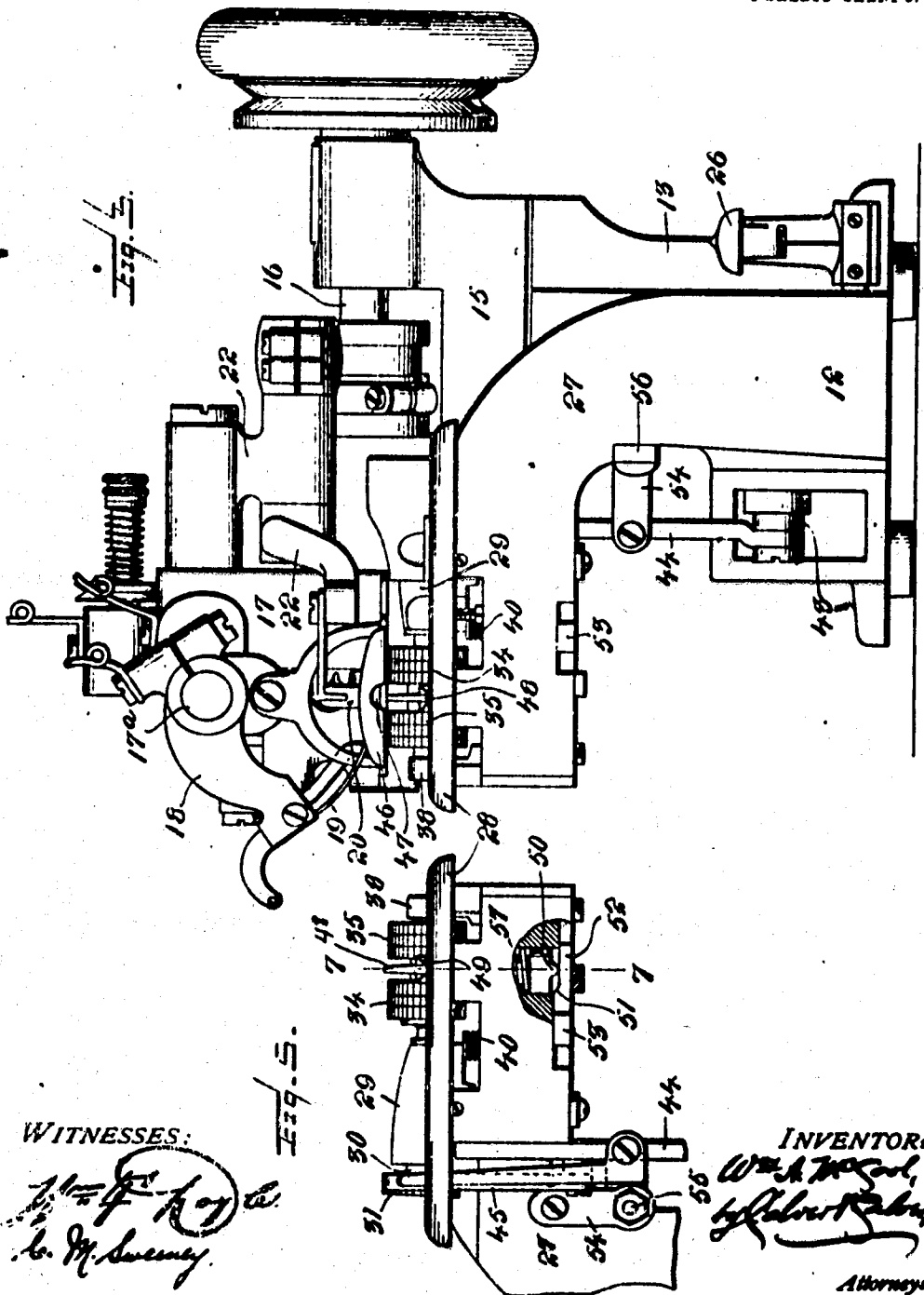
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2 SHEETS-SHEET 3.



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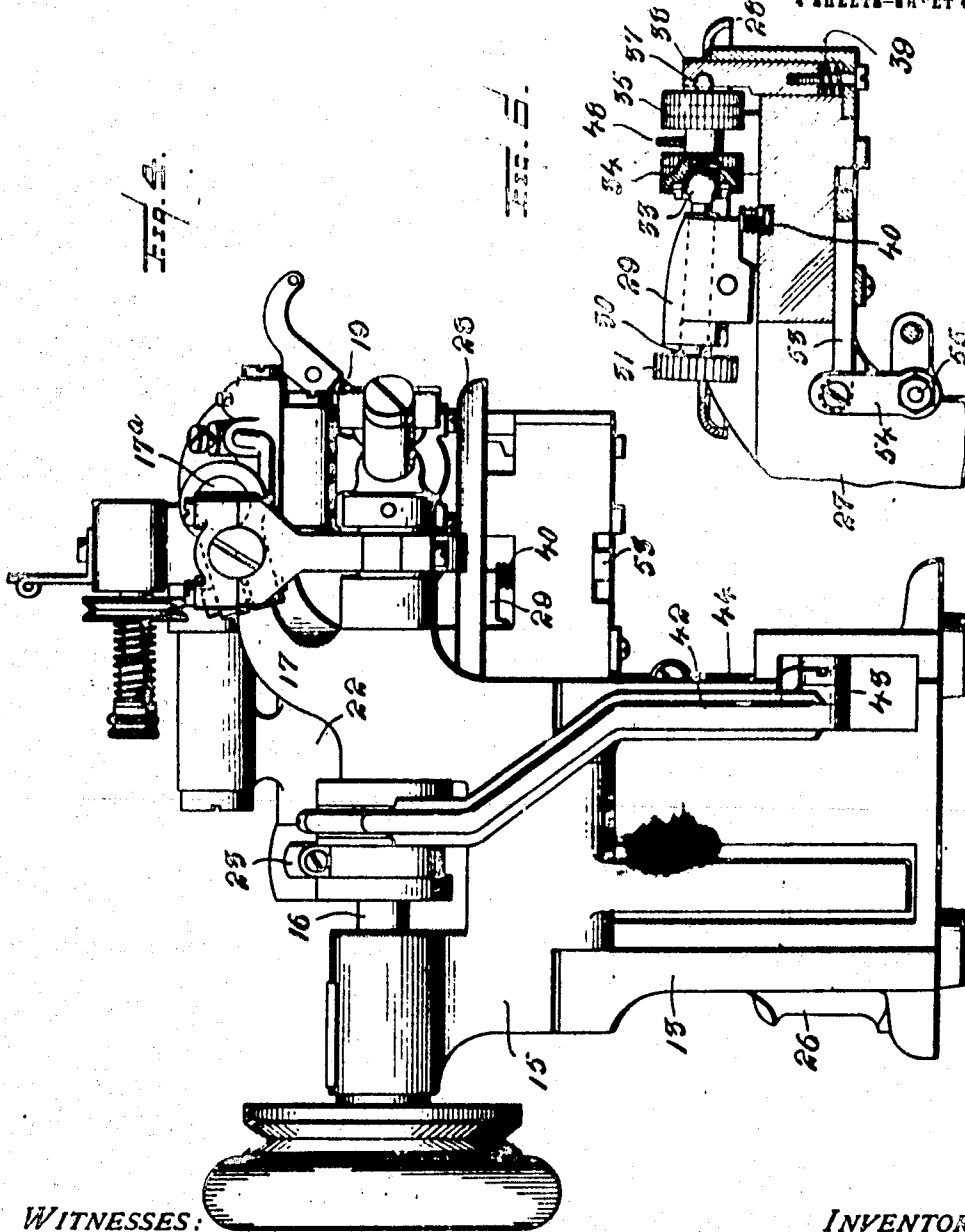
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4 SHEETS-SHEET 4.



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UNITED STATES PATENT OFFICE.

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BLINDSTITCH SEWING-MACHINE.

283,506.

Specification of Letters Patent.

Patented Feb. 7, 1911.

Application filed March 18, 1909. Serial No. 484,292.

To all whom it may concern:

Be it known that I, WILLIAM A. MCCOOL, a citizen of the United States, residing at Beaver Falls, in the county of Beaver and State of Pennsylvania, have invented or discovered certain new and useful Improvements in Blindstitch Sewing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to blind stitch sewing machines such for example as those shown and described in U. S. Patents Nos. 639,069 and 679,553, in which the needle is caused to pass through a ridge or bend in the work in such a manner that the stitches will be visible only on one side of the work; and the invention has for its object to provide a machine, of the class referred to, which will not only afford more room beneath the arm which supports the stitch-forming mechanism than is afforded in the machines of the patents above referred to, as in the machines shown by my application for U. S. Letters Patent filed May 22, 1906, Serial No. 318,480, but which will also contain a positively operated lower feed cooperating with an upper feed, as in the machine of said Patent No. 679,553, and also a movable ridge-forming device, so that certain disadvantages resulting from the normally stationary ridge-forming device of said patent will be avoided; this last-named result being secured by providing a vertically reciprocating ridge-forming device which will move upward to force the work into proper position for the needle to pass through a ridge or bend thereof, but will recede from its ridge-forming position after the point of the needle has entered the goods, so that the needle can work better, in its stitch-forming operation, than would otherwise be possible, as will hereinafter more fully appear.

In the accompanying drawings, Figures 1 and 2 are side views of the improved machine, looking from opposite sides, with certain parts in vertical section; Fig. 3 is a front view of the same, and Fig. 4 is a rear view of the improved machine. Figs. 5 and 6 are detail views, partly in section,

illustrative of the lower feeding device and of the mechanism for operating the ridge-forming device. Fig. 7 is a detail vertical section on line 7-7, Fig. 5, and Fig. 8 is a detail perspective view of the sliding bar for lifting the ridge-former at each stitch.

Referring to the drawings, 12 denotes the lower portion of the frame of the machine from which, at its rear end, rises a standard 13 with which is pivotally connected, by a hinge pin 14, a stitching frame comprising a rear portion 15 in which is mounted the driving shaft 16, said frame also comprising an overhanging arm 17 providing bearings for a rocking-shaft 17* to the front end of which is secured the vibrating arm 18 carrying the curved needle 19. The said arm 17 also supports the upper feeding device comprising the feed-dog 20 connected with an arm 21 pivotally mounted in a rocker 22 supported from said overhanging arm 17 and operated from an eccentric on the driving shaft through a connecting rod 23. From the said overhanging arm 17 is also supported a looper rod 24 carrying at its forward end a longitudinally reciprocating and rocking looper 25 operated from said driving shaft through a double crank connection.

The stitch-forming mechanism, comprising the needle and looper above referred to, is essentially the same in its construction and operation as the stitch-forming mechanism of the machines of Patents Nos. 639,069 and 679,553, above mentioned, and need not therefore be herein more fully described; while the mechanism for operating the feed dog 20 is essentially the same as that of my said application No. 318,480 hereinbefore referred to. The pivotal mounting of the stitching arm is also essentially the same as in my said application, although differing slightly in details of construction, and the forward end of said stitching frame may be lifted by pressing down on a hand lever 26 as in the machine of my said application.

In order to provide a proper clearance for the work beneath the overhanging arm of the machine, and at the same time to properly operate a lower rotating feeding device, cooperating with an upper feeding

device or feed dog, the improved machine comprises a novel lower feed operating mechanism which will now be described.

Rising from the front part of the base portion 12 of the frame of the machine is a work supporting arm or post 27 rigid and preferably formed integral with said base portion and to the top of which arm is secured a work plate 28. Pivottally mounted in the said arm, so as to be free to have a limited rocking movement, is a block 29 in which is mounted a feed shaft 30 provided at its rear end with a ratchet wheel 31, said shaft having at its forward end a ball-like stud 33 entering a socket in a feed wheel 34 rigidly connected with a second feed wheel 35, said ball-like portion of said shaft being provided with a pin entering a slot in the first-named feed wheel so as to be capable of imparting a positive rotating movement to the said rigidly connected and preferably integral feed wheels 34 and 35. Rigid with the feed wheel 35 is a ball-like stud 37 entering a socket in a yieldingly mounted post 38 forced upward by a suitable coil spring 39. The block 29 is yieldingly pressed upward at its inner end by a coil spring 40. The feeding mechanism just described is thus essentially the same as that covered by the said Patent No. 679,553, but its operating mechanism, which will now be described, is essentially different from that of the said patent. The driving shaft 16 carries an eccentric which is connected by means of a rod 42 with the rear end of a lever 43 pivoted to the base portion 12 of the frame of the machine and jointed at its forward end to a bar 44 which carries a spring-pressed pull-pawl 45 engaging the ratchet wheel 31 on the feed shaft, so that as the said eccentric rotates a vertical movement will be imparted to the said bar 44 and to the pawl carried thereby for the purpose of imparting an intermittent rotating movement to the said feed shaft and to the feed wheels 34 and 35 operated therefrom. It will thus be seen that the operating mechanism just described affords an operative connection for the feed shaft with the driving shaft through the base of the machine, so that a suitable clearance for the work above said base is afforded without in any way interfering with the feed-operating mechanism. I do not, however, herein claim this particular feeding mechanism and its operative connection with the driving shaft, as above referred to, as the same is claimed in my application Serial No. 567,162, filed June 16, 1910, and which is a division of this application. The presser foot 46, rigidly connected with the overhanging arm 17, is provided, as in the machines of the said patents, with a longitudinal slot 47 through which a bend or ridge in the goods through which the needle is to pass in forming blind stitching is forced by

a ridge-former 48. Instead of having the ridge-former stationary with the work support, as in the machine of the said Patent No. 679,553, the said ridge-former is, in the present instance, constructed to have a vertical reciprocating movement, so that it may move upward to form a bend or ridge in the goods through which the needle is to pass; and, after the point of the needle has entered the goods, such ridge-former will recede to permit the needle to complete its stitch-forming movement without danger of interference with the said ridge-former; and by the movement of the latter away from the needle after the point of the needle has entered the goods the needle is subjected to less strain, and its thicker portion or shank is not cramped by being forced too close to the surface of the ridge-former. In machines of the kind to which the present invention relates, and in which the ridge-former is stationary with the work-support, as in the machine of the said Patent No. 679,553, it is necessary, in order to secure the best results, that the parts should be adjusted so that the needle runs so close to the ridge-former that it is likely to interfere therewith as the thicker portion of its shank comes opposite said ridge-former, and thus wear a groove in the ridge-former, and which groove afterward renders it difficult to perform perfect blind stitching. This objection is avoided in the present construction, as is also the liability of cramping the needle in the goods adjacent to the ridge-former, and the springing of the needle due to such cramping, in that the ridge-former is, at every stitch, caused to recede from the path of the needle after the point of the needle has entered the goods. To this end the ridge-former or ridge-forming device 48 is attached at its ends to pins 49 mounted in suitable sockets in the work-support and which pins are preferably provided at their lower ends with rounded portions or projections 50 engaged by cams or inclines 51 formed on arms 52 of a sliding reciprocating T-formed bar 53 jointed at its rear end to a bell-crank lever 54 having its fulcrum on a pin or stud 55 extending from a bracket 56 attached to the work-supporting arm or post 27, the lower or horizontal arm of said bell-crank lever being jointed to the vertically reciprocating feed-operating bar 44 so that as the said bar moves up and down the said T-formed slide will be moved back and forth. As the cams or inclines 51 on the arms 52 of the said bar engage the projections at the lower ends of said pins 49 the ridge-former will be lifted to force the work upward through the slot in the presser-foot in the form of a ridge or bend which will be entered by the needle; and, as above stated, as soon as the point of the needle has entered said bend or ridge in the work the

Y-formed slide will retire to permit the said ridge-former to be depressed by the coil-springs 57 encircling said pins and interposed between annular shoulders on said pins and shoulders afforded by the frame of the machine. It will therefore be understood that the ridge-former will be lifted at every stitch, and will be held in its lifted position during the feeding operation and for a proper time to enable the point of the needle to enter the work; after which it will retire to enable the needle to complete its stitch-forming movement; and the said ridge-former will then again rise so that the work beneath the feed-dog 20, and which is directly above said ridge-former, may be properly engaged by said feed dog during the feeding movement. The reciprocating ridge-former therefore cooperates directly with the upper feed dog, while the feed-wheels 34 and 35, between which the said ridge-former is arranged, cooperate directly with the presser-foot which latter presses on the work above said feed-wheels.

By reference to Fig. 8 of the drawings it will be seen that the feed dog 20 is arranged directly over the ridge-former 48 which latter serves as a support for the work against the thrust of the feed dog. As shown in Figs. 1 and 2 the feed dog has a straight lower serrated face working against a straight or horizontal portion of the upper face (see Fig. 7) of the ridge former or work-support 48; and owing to the cooperative action of the feed dog and the ridge-former or work-support 48, the said feed dog has a strong grip upon the goods, so that an accurate feeding of the latter is insured. Thus the feed dog, cooperating with the ridge-former or work-support arranged directly beneath the said feed dog, and also in cooperation with the lower feeding wheels 34 and 35, provides a feeding mechanism by which two plies of goods which are being blind-stitched will be fed along together with the greatest accuracy and uniformity, so that any puckering of the work, owing to uneven feeding of the two plies of goods, will be absolutely avoided.

Having thus described my invention I claim and desire to secure by Letters Patent:

1. In a blind-stitch sewing machine, the combination with suitable stitch-forming mechanism comprising a needle, of a feeding device for advancing the work, a presser-foot, having a longitudinal slot or opening, a ridge-forming device which extends lengthwise in the line of the feed of the work but which is separate from or independent of said feeding device, the said ridge-forming device being mounted beneath said presser-foot and arranged transverse to the direction of the movements of said needle and serving to force the work upward through said slot, and means for positively raising

and for lowering said ridge-forming device at each stitch.

2. In a blind stitch sewing machine, the combination with suitable stitch-forming mechanism, of a presser foot, a ridge-forming device mounted beneath said presser-foot, means for raising and lowering said ridge-forming device at each stitch, and a feeding mechanism for advancing the work, said feeding mechanism comprising a reciprocating upper feeding device and a rotating lower feeding device.

3. In a blind-stitch sewing machine, the combination with suitable stitch-forming mechanism, of a presser-foot, a ridge-forming device, means for raising and lowering said ridge-forming device at each stitch, and a feeding mechanism for advancing the work, said feeding mechanism comprising a reciprocating upper feeding device arranged directly over said ridge-forming device, and a rotating lower feeding device.

4. In a blind-stitch sewing machine, the combination with suitable stitch-forming mechanism, of a presser-foot, a ridge-forming device mounted beneath said presser-foot, means for raising and lowering said ridge-forming device at each stitch, and a feeding mechanism for advancing the work, said feeding mechanism comprising a reciprocating upper feeding device and a rotating lower feeding device comprising two yieldingly mounted feed wheels arranged on opposite sides of said ridge-forming device.

5. In a blind-stitch sewing machine, the combination with suitable stitch-forming mechanism, of a presser-foot, a ridge-forming device mounted beneath said presser-foot, means for raising and lowering said ridge-forming device at each stitch, and a feeding mechanism for advancing the work, said feeding mechanism comprising a reciprocating upper feeding device arranged directly over said ridge-forming device, and a rotating lower feeding device comprising two yieldingly mounted feed wheels arranged on opposite sides of said ridge-forming device.

6. In a blind-stitch sewing machine, the combination with suitable stitch-forming devices, of a presser-foot provided with an opening or recess, a ridge-forming device beneath said opening or recess, means for raising and lowering said ridge-forming device at each stitch and comprising a sliding bar provided with cams or inclines, pins or posts supporting said ridge-forming device and engaged by said cams or inclines, springs for lowering said pins or posts after they have been lifted by said cams or inclines, and means for reciprocating said sliding bar.

7. In a blind stitch sewing machine, the combination with stitch-forming devices, of an upper feed dog having a straight serrated lower face, a work-supporting ridge-former

arranged directly beneath the said feed dog and having a straight or horizontal upper face portion, a lower rotating feeding device cooperating with said work-supporting ridge-former and said feed dog, and mechanism for operating the said feed dog and lower rotating feeding device in unison.

In testimony whereof I affix my signature, in presence of two witnesses.

WILLIAM A. McCOOL.

Witnesses:

HENRY CALVER,
CHAS. S. HYER.