

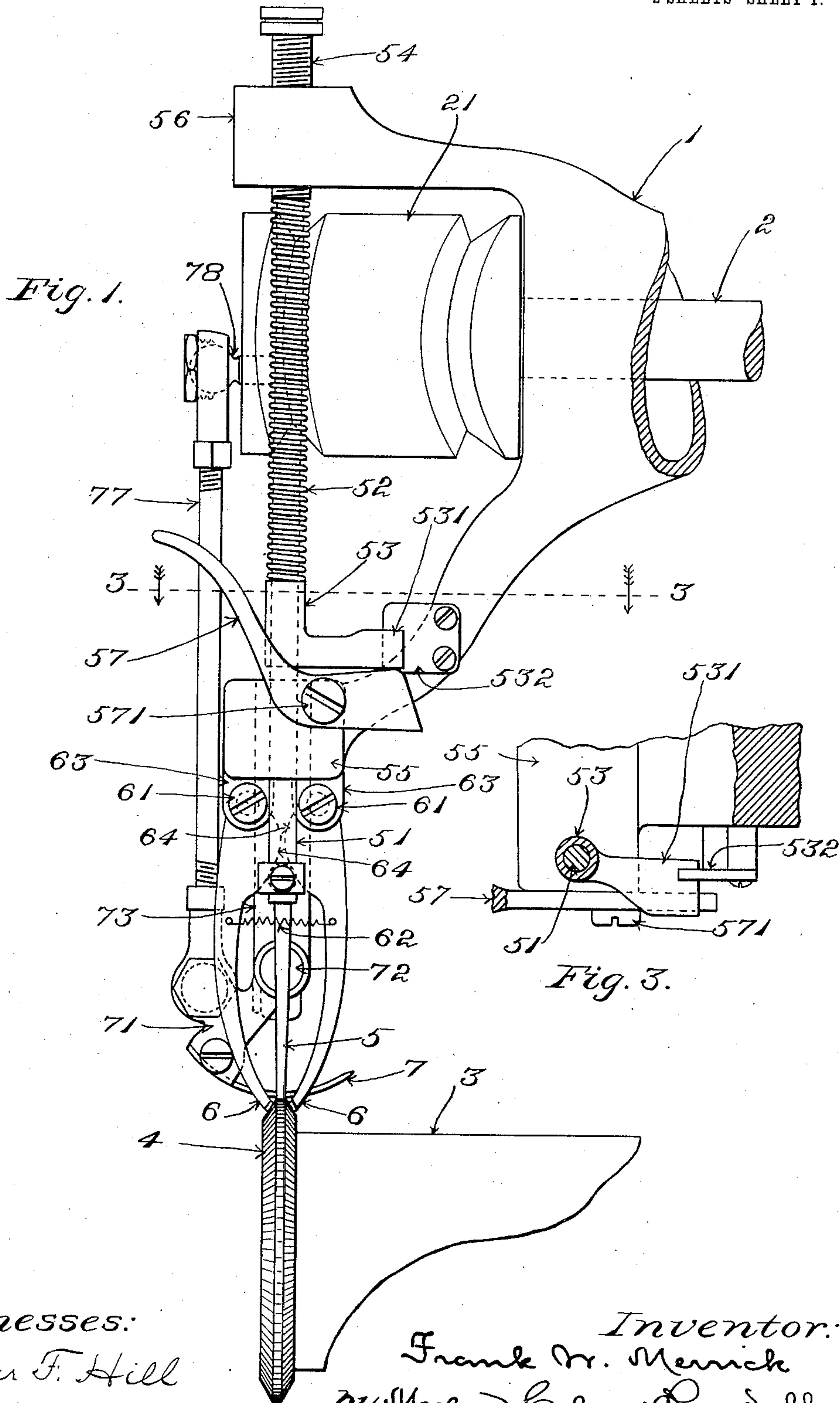
No. 854,660.

PATENTED MAY 21, 1907.

F. W. MERRICK.  
BLINDSTITCHING SEWING MACHINE.

APPLICATION FILED AUG. 1, 1904.

2 SHEETS—SHEET 1.



Witnesses:  
Oscar F. Hill  
Edith J. Anderson.

Inventor:  
Frank W. Merrick  
by Maceo Calver & Randall  
Attorneys.

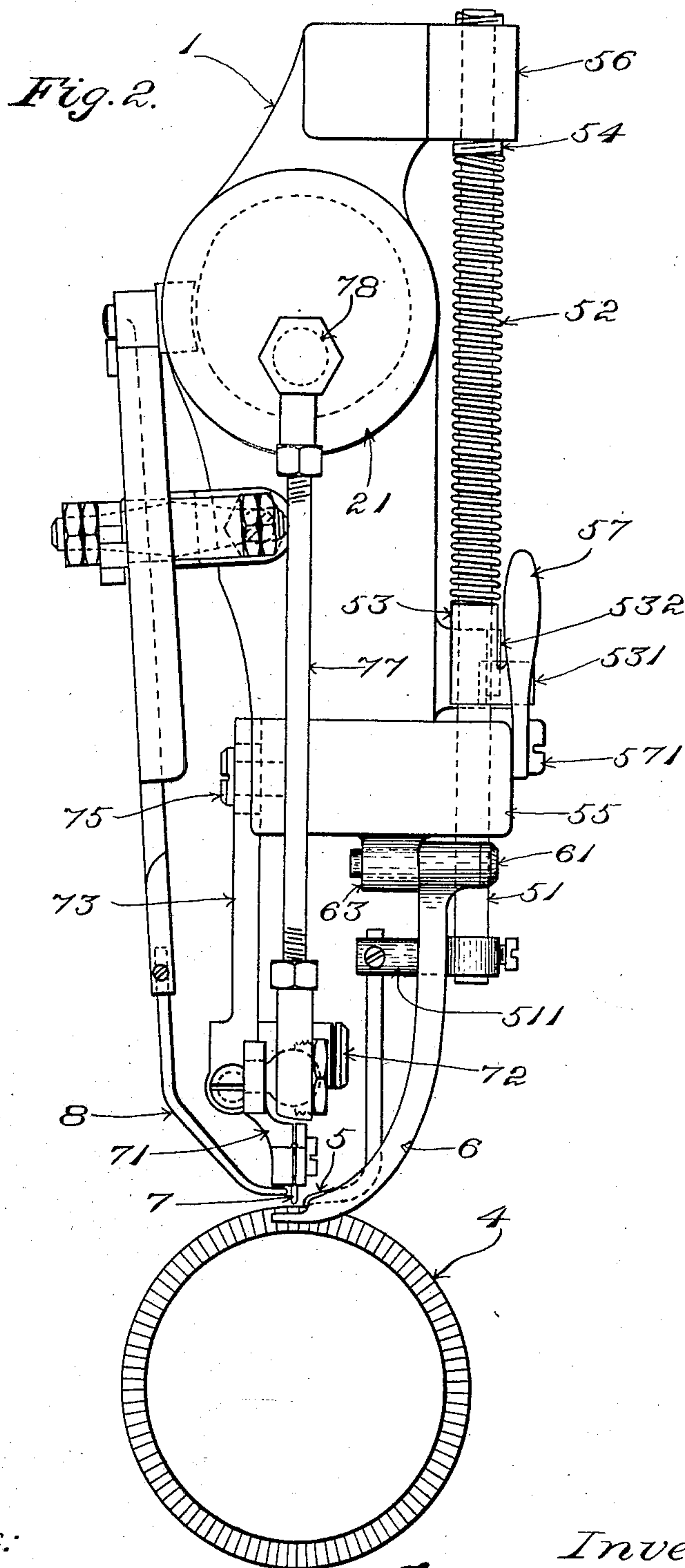
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# UNITED STATES PATENT OFFICE.

FRANK W. MERRICK, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO UNION LOCK STITCH COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MAINE.

## BLINDSTITCHING SEWING-MACHINE.

No. 854,660.

Specification of Letters Patent.

Patented May 21, 1907.

Application filed August 1, 1904. Serial No. 218,994.

*To all whom it may concern:*

Be it known that I, FRANK W. MERRICK, a citizen of the United States, residing at Boston, in the county of Suffolk, State of Massachusetts, have invented a certain new and useful Improvement in Blindstitching Sewing-Machines and the Like, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention comprises various improvements which have been designed more especially to be employed in blind-stitching machines.

The essential functional elements of a blind-stitching machine of the type to which my invention relates are, in general, a former provided with a projecting or salient V-shaped acting portion to engage with the material which is to be operated upon and through co-action with the presser-devices produce a corresponding bend in the said material, means to occasion the feed of the material as the stitching progresses, presser-devices to co-operate in bending and feeding the material, a needle to pass loops of needle-thread through the bend in the material, and a looper to extend the said loops successively over the ridge of the said bend from one side of the bend to the other, and on the latter side present them in position to be passed through by the point of the needle as it re-enters the material, to thereby enchain the stitches.

The improvements aforesaid involve, in particular, the devices for crimping, creasing, or bending the material which is operated upon, and feeding the said material.

I have shown in the accompanying drawings the essential portions of a blind-stitching machine containing my improvements in the best form of embodiment which I have yet contrived. I will proceed to describe the construction as the same is shown in the said drawings, but it is to be understood that in carrying the invention into effect in practice I am not necessarily restricted to the precise details which are thus shown, nor to the use of the invention in the precise connections or relations which are set forth herein.

In the drawings,—Figure 1 shows in front elevation sufficient of the said blind-stitching machine to render clear the nature and relations of the invention. Fig. 2 is an end ele-

vation, looking at the head of the sewing machine from the left-hand side in Fig. 1. Fig. 3 is a detail plan view partly in horizontal section on the dotted line 3—3 of Fig. 1.

Having reference to the drawings,—portion of the overhanging arm forming part of the fixed frame of a sewing machine is shown at 1, portion of a rotating driving-shaft which is mounted in suitable bearings in the said arm being shown at 2, Fig. 1. At the head-end of the driving-shaft a hub 21 is fast thereon, such hub being located within the opening of the head of the arm 1. This hub is provided with the crank from which the needle is actuated, and is constructed with the cam-formation through the agency of which the looper is actuated. Portion of a cylindrical arm located below the said overhanging arm and also forming part of the said fixed frame is shown at 3. The said arm 3 is provided with means for feeding, etc., the material which is operated upon, as presently will be described.

In carrying the invention into effect, I preferably, though not necessarily in all cases, employ a construction in which one part serves as both a former and a feeding device. The said part, in the machine shown in the drawings, is a wheel 4, although I do not limit myself to the use invariably of a feed-wheel for the purposes named above. The wheel 4 is or may be mounted in usual manner in connection with arm 3, and in practice will be intermittingly-rotated by actuating connections of usual or suitable character, well understood by those skilled in the art and therefore not necessary to be shown and described herein. For the attainment of the function of crimping, bending, or creasing, by co-operation with the presser-devices as aforesaid, the material that is to be stitched, in order to facilitate the penetration of the needle into the thickness of the said material, the peripheral acting portion of the feeding-device is made V-shaped in cross-section, and the material in being bent over the said V-shaped portion conforms to the shape and angle thereof. To enable the feeding-device to engage frictionally with the material that is being stitched, the converging surfaces of the same, at opposite sides of the prominent edge-portion, are roughened. The presser-devices comprise a presser-



foot 5, which is arranged to act in line with the edge-portion of the former and feed device 4, and side-pressers 6, 6, which are located, respectively, at opposite sides of the said presser-foot 5 and at opposite sides of the line of stitching. The said presser-foot is movable independently of the side-pressers, and through the tension of a spring 52 is borne separately with yielding force toward the said edge-portion, to compress the material intervening between the latter and the presser-foot against the said edge-portion. The feed-wheel 4 rotates about a relatively fixed axis, or in other words has no vertical movement. The position of the edge-portion thereof consequently is fixed with respect to the path of movement of the needle. The said edge-portion, therefore, constitutes a gage against which the under face of the material bears, and by means of which the distance between the stitches which are formed in the material and the said under face of the material is caused to remain uniform, notwithstanding any variations in the thickness of the portions of the material passing between the feed-device and the presser-foot 5. The last mentioned part accommodates itself under the action of its spring to the said thickness, whatever may be the said variations, and because of its independence of the side-pressers neither affects nor is affected by the position and action of the latter. The presser-foot is attached to a holder 511 which in turn is mounted upon the lower end of a presser-bar 51, the said presser-bar being fitted to guides with which the fixed head of the machine is provided therefor as usual in sewing-machines, and the spring 52 being caused to encircle the presser-bar between a collar 53 that is fixed upon the presser-bar and the lower end of the sleeve 54 through which the upper portion of the presser-bar extends, the sleeve constituting the upper guide for the presser-bar, and the lower guide being formed in the lug 55 forming part of the fixed head. The sleeve 54 is screw-threaded exteriorly, and is screwed into an interiorly threaded hole that is tapped through the upper lug 56 of the head of the machine. The spring 52 is compressed between the upper side of the collar 53 and the lower end of the sleeve 54, and its tension is regulated in customary manner by screwing the said sleeve downward or upward. The collar 53 is furnished with a projecting arm 531, Figs. 1 and 3, the latter being slotted to receive the edge and a portion of the width of a plate 532 that is attached to the fixed head of the machine, the sliding engagement of the arm and plate with each other serving to prevent turning and lateral displacement of the presser-foot with respect to the edge-portion of the former and feed-device, but leaving the presser-bar and presser foot free to ascend and descend. A presser-foot

lifting lever 57 of customary character is provided, it being pivotally mounted at 571 upon the fixed head of the machine, and having an eccentric or cam-portion to engage with the said arm 531.

The presser-foot 5 is located in advance of the path of the needle, and its acting portion extends into close proximity to the path of the needle, but not far enough to intersect the said path. The side-pressers 6, 6, hold the material down, at opposite sides of the edge-portion or ridge of the former and feed-device, so as to produce the bend in the said material. They serve to keep the material in place as the needle passes transversely into and out of the same, and they press the material into firm contact with the roughened lateral surfaces of the feeding device and thereby insure the regular feeding of the material. Their acting portions occupy positions during operation below the path of the needle but closely adjacent the said path. The side-pressers are movably mounted and are spring-actuated, whereby they are enabled to accommodate themselves to variations in the thickness of the material passing between their acting portions and the former and feed-device. In order to enable the machine to be used for blind-stitching the edge of the turned-under portion of a trousers-leg, or the corresponding edge at the bottom of a skirt, it is necessary that the side-pressers should be capable of adapting themselves to the increase of thickness at the vertical seams, and to the difference between the thickness of material at one side of the edge-portion or the ridge of the former and feed-device and the thickness thereof at the other side thereof. In the present instance, the side-pressers are separately pivoted, at 61, 61, and are freely movable about their respective pivots in directions toward and from the opposite side-portions of the feed-wheel. The spring 62 by means of which they are pressed toward the said side-portions of the feed-wheel is a contracting spiral spring having its opposite extremities attached to the respective arms of the side-pressers. The support to which the arms of the side-pressers are pivotally connected may vary in practice, but usually I employ a fixed support, which in the present instance is constituted by a lug 63 forming part of or connected with the head of the machine. In order to provide conveniently for separating the side-pressers from the material when the presser-foot is raised, so as to entirely release the said material, the arms of the side-pressers are furnished with cam-shaped portions 64, 64, approaching each other, and between which a portion of the holder of the presser-foot is carried in the rising movement of the presser-bar. By the action of the said portion of the holder of the presser-foot against the said cam-shaped portions of the arms of the side-pressers, the



latter are spread apart and thereby moved out of contact with the material when the presser-foot is lifted.

The independence of the presser-foot 5 with respect to the side-pressers 6, 6, is important, inasmuch as it enables the presser-foot, under the action of its spring 52, to press the material intervening between the presser-foot and the ridge or edge portion of the work-support or gage at the under surface of the material against the said ridge or edge portion with uniform force at all times regardless of variations in the thickness of material which may be presented to the side-pressers. If the presser-foot and side-pressers were all fixed relative to one another and arranged to move in unison toward and from the work-support, a given thickness of material intervening between the latter and one side-presser would lift the pressing devices more than the same thickness of material at the apex or edge portion of the work-support would serve to lift them. The result would be looseness or slack in the material at the said apex or edge portion, with a tendency on the part of the material to rise relative to the latter so as to result in the needle pricking through to the under surface of the material, which is the right face thereof. In this event the stitches would show upon the said under surface or right face of the material, which is undesirable. In order to obviate work which is defective in this respect, it is highly important that the under surface of the material should be held at all times in firm and close contact with the ridge or edge-portion of the work-support, for if the material rises out of such contact the needle will pass below the same and the stitch will show on the surface of the goods. It is in order that the thickness of material intervening between the work-support and either of the side-pressers, or variations in such thickness, may have no effect upon the firmness with which the material is held against the ridge or edge-portion of the work-support that I employ a separate and independent presser at the latter place.

The needle is shown at 7. It is curved, and is attached to the needle-carrying arm 71, which latter is hung or mounted upon a horizontally-disposed pivotal stud 72. The pivotal axis of the arm 71 extends in the direction of the feed, and is located in the same plane with the ridge of the former and feed-device. Consequently, the needle-carrying arm swings in a direction at right angles to the line of the feed. The stud 72 is carried by the lower end of a supporting arm 73, which last is attached by means of a screw 75, Fig. 2, to the head of arm 1. For the actuation of the needle, the needle-carrying arm 71 is connected by means of a link 77 with a crank-pin 78 on the outer end of the hub 21.

As will be understood, in operation the needle penetrates the material as the latter lies bent over the ridge of the former and feed-device, passing partly through the thickness of the layer or layers resting upon the latter, and the point thereof issuing at the same side of the material that it entered. The looper 8 engages with the loop of needle-thread that has been passed through the material by the entering movement of the needle, and at the time of the withdrawal of the needle carries the said loop over the ridge of the feed-device into position at the opposite side of said ridge to be passed through by the point of the needle as it enters the material for the production of an ensuing stitch, the looper thus co-operating with the needle in enchaining the stitches.

The looper 8 is actuated by means of suitable devices for the purpose, not necessary to be set forth in detail inasmuch as they form no part of the invention that is claimed herein. Devices for the purpose are employed in prior machines and are well-known.

I claim as my invention:—

1. The combination with the work-support having a V-shaped ridge, and the needle having a path which extends transversely with relation to the said ridge, of the side-pressers movable toward and from each other and acting against the opposite inclined sides of the ridge to bend the material over the latter, and the independent presser-foot acting in the plane of the ridge to press the material against the latter.
2. The combination with the work-support having a ridge, and occupying a relatively fixed position and the needle having a path which extends transversely with relation to the said ridge, of the spring-actuated side-pressers to bend the material over the ridge, the presser-foot acting in the plane of the ridge, the spring by which said presser-foot is actuated, and means to manually raise the presser-foot.
3. The combination with the work-support having a ridge, and a needle moving transversely with relation to the latter, of spring-actuated side-pressers movable transversely toward and from the sides of said ridge, and an independent presser acting in the plane of the ridge.
4. The combination with a work-support having a ridge, and the needle having a path which extends transversely with relation to the said ridge, of independently movable spring-actuated side-pressers, the presser-foot acting in the plane of the ridge, the spring by which the said presser-foot is actuated, and means to normally raise the presser-foot.
5. The combination with a former and feed-device occupying a relatively fixed position, and the needle moving transversely with relation thereto, of side-pressers acting



in connection with the opposite sides of the said former and feed-device, and an intermediate independent presser-foot.

6. The combination with a former and feed-device, and the needle moving transversely with relation thereto, of spring-actuated side-pressers movable transversely toward and from each other, and an intermediate presser-foot.

7. The combination with a former and feed-device, and the needle moving transversely with relation thereto, of spring-actuated side-pressers movable toward and from each other, and an intermediate independent spring-actuated presser-foot.

8. The combination with the work-support having a ridge, and a needle moving transversely with relation to the latter, of side-pressers acting at the opposite sides of the said ridge, means to support the said side-pressers, an intermediate presser acting in the plane of the ridge, and means to manually raise the said presser independently.

9. The combination with the work-support, and the needle, of the side-pressers, a support for the said side-pressers, an inter-

mediate presser, and means to raise the said intermediate presser and separate the side-pressers transversely from the work-support.

10. The combination with the work-support and the needle, of the side-pressers, a fixed support for the said side-pressers, an intermediate presser, and means to raise the said intermediate presser and move the side-pressers transversely to thereby separate them from the work-support.

11. The combination with the work-support and the needle, of the pivotally-mounted spring-actuated side-pressers provided with the cam-surfaces, an intermediate presser, the spring-actuated presser-bar provided with means to engage the said cam-surfaces and by acting thereagainst spread the side-pressers to separate them from the work-support, and means to raise the said presser-bar.

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

FRANK W. MERRICK.

Witnesses:

CHAS. F. RANDALL,

WILLIAM A. COPELAND.