J. R. MOFFATT & R. S. KELSO.

FOLDING MECHANISM FOR SEWING MACHINES.

APPLICATION FILED SEPT. 19, 1911.

1,246,301.

Patented Nov. 13, 1917.

4 SHEETS—SHEET 1.

Fig. 1.

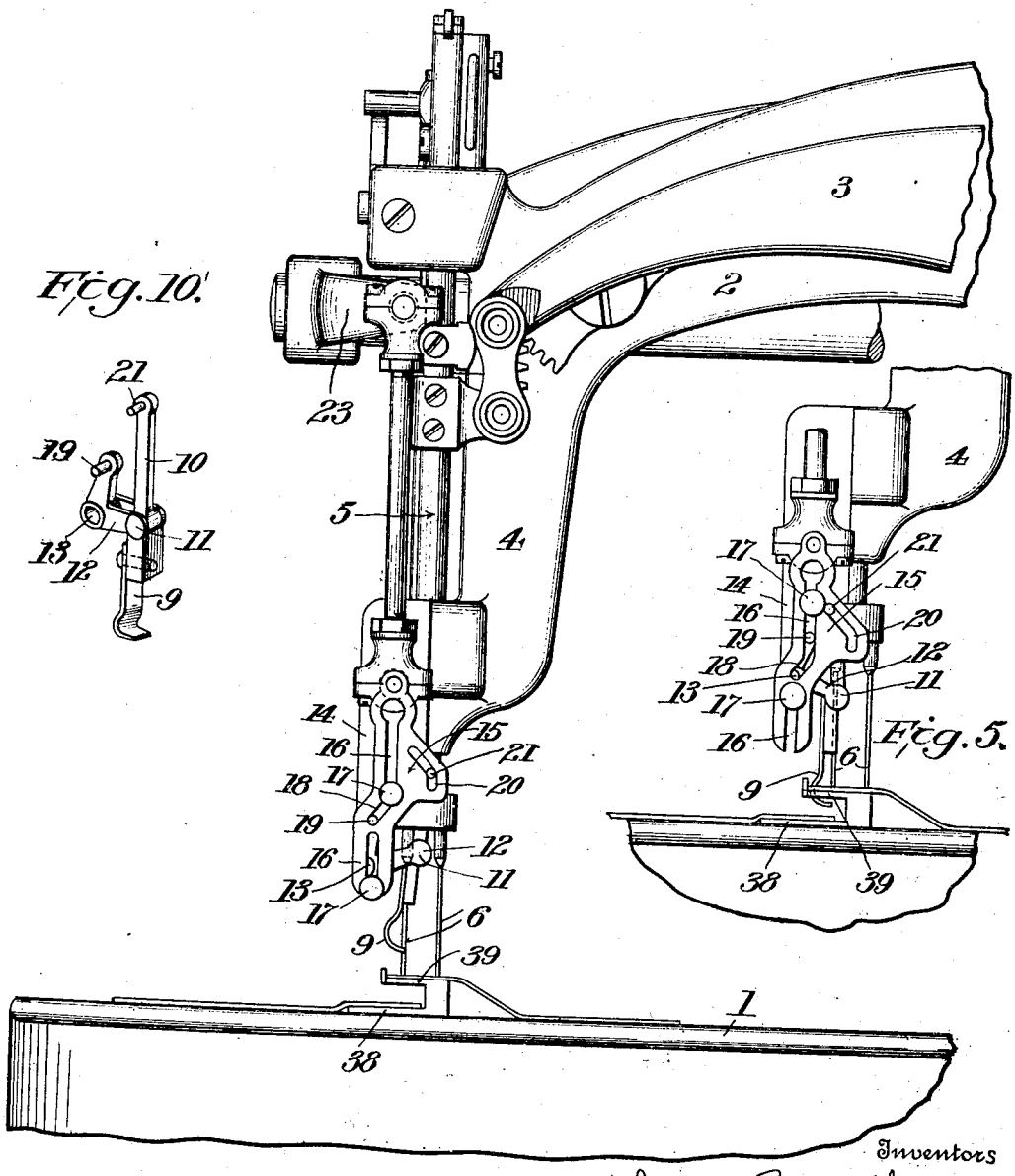


Fig. 10.

Fig. 5.

Witnesses

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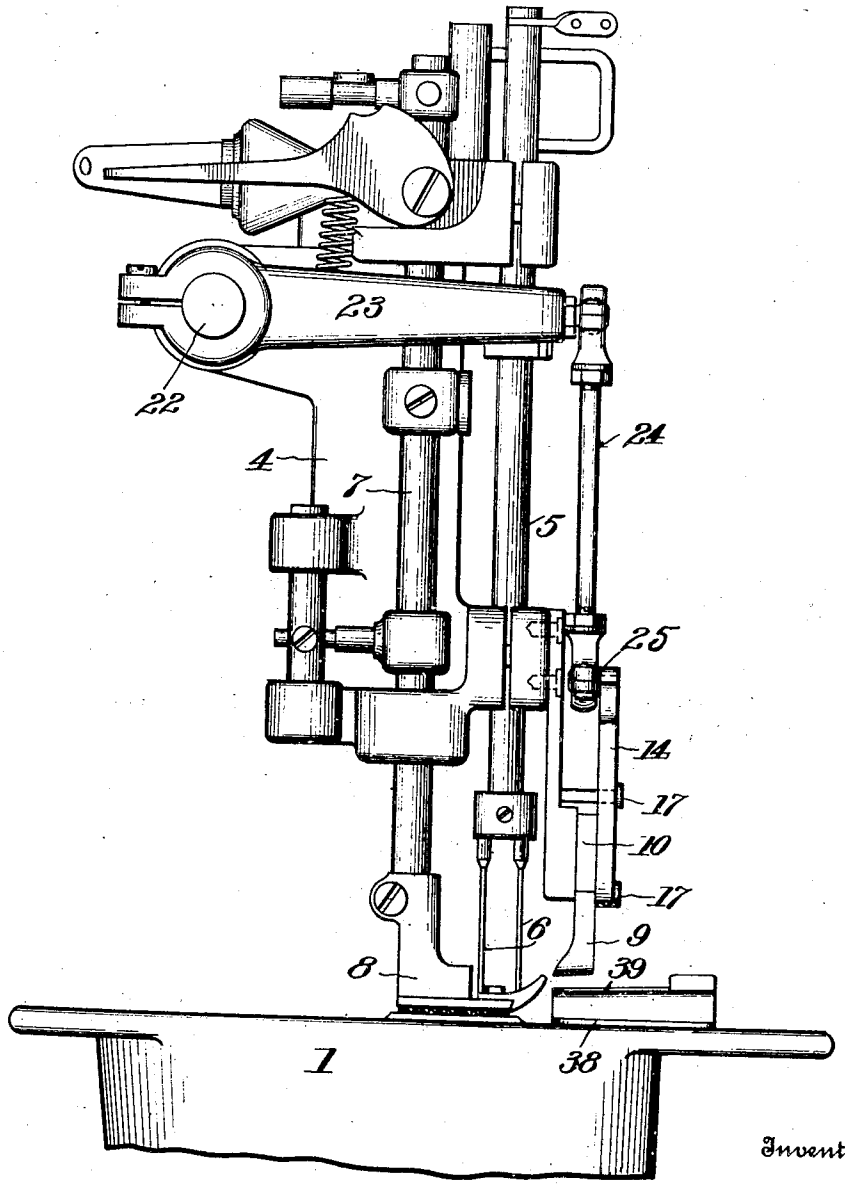
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4 SHEETS—SHEET 2.

Fig. 2.



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4 SHEETS—SHEET 3.

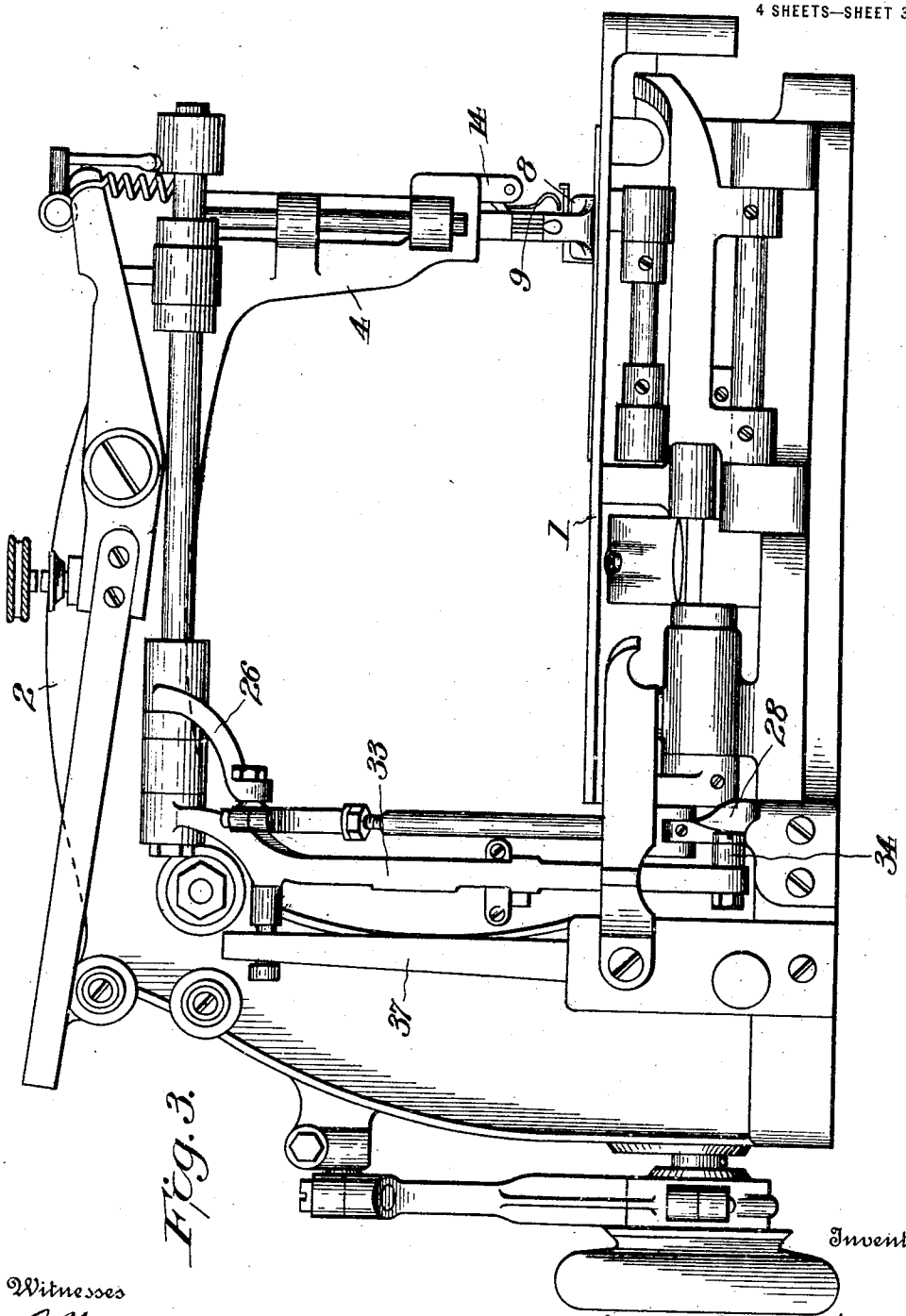


Fig. 3.

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4 SHEETS—SHEET 4.

Fig. 4.

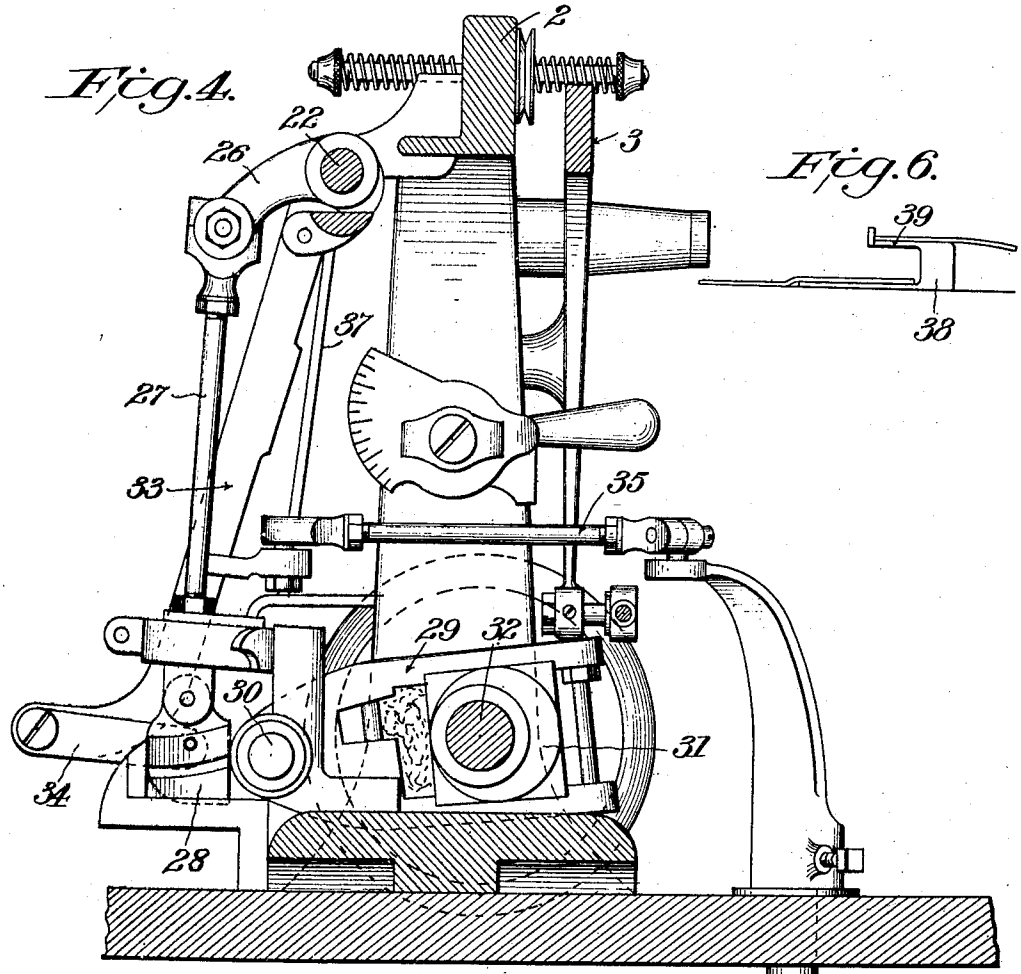


Fig. 6.

Fig. 7.

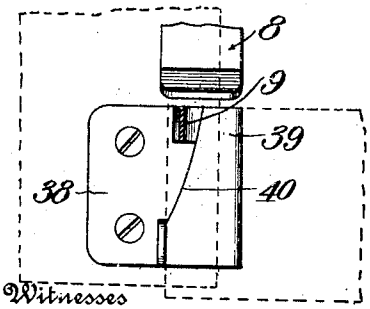


Fig. 8.

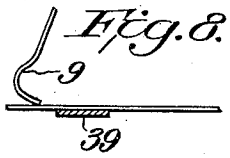
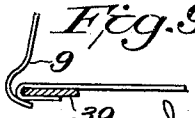


Fig. 9.



Witnesses

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UNITED STATES PATENT OFFICE.

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FOLDING MECHANISM FOR SEWING-MACHINES.

1,246,301. Specification of Letters Patent. Patented Nov. 13, 1917.

Application filed September 19, 1911. Serial No. 650,122.

To all whom it may concern:

Be it known that we, JAMES R. MOFFATT and RALPH S. KELSO, citizens of the United States, residing at Chicago, in the county of Cook, State of Illinois, have invented certain new and useful Improvements in Folding Mechanism for Sewing-Machines, of which the following is a description, reference being had to the accompanying drawing and to the letters and figures of reference marked thereon.

The invention relates to new and useful improvements in folding devices for sewing machines, and more especially to folding devices which are given a movement in order to turn a fold in a fabric.

An object of the invention, is to provide a folder which may be located at a point directly in front of the stitching mechanism, and which may be moved in order to fold the edge of a fabric.

A further object of the invention, is to provide a folder of the above character, which may be controlled by the operator so as to render the same ineffective, when desired.

In the drawings which show by way of illustration one embodiment of the invention;

Figure 1 is a front view of a portion of a sewing machine having my improvements applied thereto;

Fig. 2 is a front end view of the same;

Fig. 3 is a rear view of the machine;

Fig. 4 is a sectional view showing the folder operating mechanism in side elevation;

Fig. 5 is a front view showing the cam plate for operating the folder, in a different position from that shown in Fig. 1;

Fig. 6 is a front view of a stationary folder for guiding the fabric to be folded, and for guiding a body fabric to which it is to be stitched;

Fig. 7 is a detail view partly in section, showing the folder in plan, the folding finger in section, and the forward end of the presser foot;

Fig. 8 is a view more or less diagrammatic, showing the folding finger and the rest for the fabric;

Fig. 9 is a similar view showing the edge of the fabric folded underneath the rest.

Fig. 10 is a perspective view showing the folding finger and the parts for supporting the same.

We have shown our invention as applied to a sewing machine which consists of a work support 1, an overhanging arm 2 on which is mounted a needle lever 3. At the forward end of the overhanging arm is a needle head 4 on which reciprocates the needle bar 5, carrying a needle 6. The needle bar is connected to the needle lever in the usual way. A presser bar 7 is mounted in the needle head and carries a presser foot 8. The feeding mechanism is of the usual construction, and will not need description.

It is often found desirable to turn the edge of a fabric which is to be stitched to a body fabric. In order to accomplish this folding of the edge of the fabric, we have provided a folding finger 9, which as herein shown, is moved in a plane substantially at right angles to the line of feed. The folding finger is carried by a supporting bar 10, which in turn is pivoted at 11 to a rock lever 12. The rock shaft 12 is pivoted at 13 to a bracket 14, which is secured to the needle head in any desired way.

A cam plate 15 is mounted to slide on the bracket 14. Said cam plate is formed with vertical slots 16, through which extend guiding studs 17, which are secured to the bracket. The upper vertical slot 16 is deflected laterally to form a cam slot 18. The rock lever 12 is formed with a roller 19, which engages the cam slot 18. The cam plate 15 is formed with a second cam slot 20. The bar 10 which directly supports the folding finger 9, is formed with a roller 21 which runs in the cam slot 20. This cam slot 20 is provided with a vertical portion and a laterally deflected portion. The cam slot 18 is formed as a continuation of the vertical slot 16, and therefore, this cam slot has a vertical portion and a laterally deflected portion.

As a means for reciprocating the cam plate 16, we have mounted on the overhanging arm of the machine, a rock shaft 22. This rock shaft carries an arm 23 (see Fig. 2), which is formed with a ball stud at its free end. A link 24 is connected with said ball stud at one end, and with a ball stud 25 at the upper end of the cam plate 15. It will therefore be seen, that if the rock shaft 22 is oscillated, the cam plate 15 will

be raised and lowered on its supporting studs. When the cam plate is at its extreme upper position, the roller carried by the rock lever 12 will be at the lower end of the slot 18, and the roller carried by the bar 10, will be substantially at the lower end of the cam slot 20.

A downward movement of the cam plate, will oscillate the rock lever 12 on its axis, and carry the supporting bar 10 and finger bodily downward. As soon as the roller on the rock shaft reaches the vertical portion of the cam slot 18, the downward movement of the rock shaft ceases, and the cam plate will then be moved downward relative to the roller on the supporting bar 10, as the bodily downward movement of this bar ceases with the oscillation of the rock lever 12. This further downward movement of the cam plate, will cause the roller on the bar 10 to engage the deflected portion of the cam slot 20, and thus swing the bar 10 about its pivotal connection with the rock lever 12. An upward movement of the cam plate 15 will cause a reverse movement of the folding finger 9. That is, it will give to said folding finger first a lateral swinging movement about the pivotal support of the bar 10, and then an upward bodily movement. It is obvious that by changing the shape of the cam slots 18 and 20, we may vary the movement of the folding finger 9. Under certain conditions, it may be desired to give such folding finger purely a lateral movement, but little or no vertical movement. It will be evident that this can be readily accomplished by a slight change in the shape of the slots referred to.

It also might be desirable at certain times to give said folding finger a slight lateral movement above the material, before moving the same bodily downward, and this also could be accomplished by a slight change in these cam slots.

The rock shaft 22 carries an arm 26 at its rear end, which is connected to a link 27. Said link at its lower end is pivoted to a rocker head 28, which is adapted to engage a rib on a rock lever 29. Said rock lever 29 is pivoted at 30, and coöperates at its free end with an eccentric 31 on the main shaft 32. The rocker head is slidingly connected with the rib on the rock shaft so that it may be moved along said rib to vary the oscillations imparted to the rock shaft 22 from the rock lever 29, or so that the rocker head may be moved over the fulcrum of the rock lever 29 or entirely disengaged from the rock lever, so that the rock shaft 22 may be rendered inoperative.

As a means for moving the rocker head on the rock lever 29, we have provided a lever 33 which is connected by a link 34 to the rocker head, and said lever 33 is connected by a second link 35 with a knee shift 36. A spring 37 may be provided for forcing the lever 33 inwardly so as to normally hold the rocker head in engagement with the rock lever. When it is desired to render the folder ineffective or inoperative, the knee shift may be swung so as to throw the lever 33 over the fulcrum of the rock lever 29 or disengage the same therefrom, and this will render the rock shaft 22 inactive, and cause the movements of the folding finger to cease. The fulcrum of the rock shaft 22 positions the folder finger at the upper end of its stroke and therefore a movement of the parts so as to render the folder finger inoperative will position the folder finger at the upper end of the stroke and substantially out of the way of the fabric. This rendering of the folder finger ineffective, is desirable in certain classes of work, as for example, when stitching a circular piece of fabric.

The folder would continue in action until the beginning of the stitching on the circular piece approaches the stitching mechanism when of course, the folder must be withdrawn to allow the completion of the stitching of the circular piece. By engaging the knee shift, the operator can readily cause the folder to cease its movements, and to stop when disengaged from the fabric, which allows the continuation of the stitching so as to finish the garment and have the finishing of the line of stitching at a point overlapping the beginning of the line of stitching. This rendering of the folder ineffective, may be accomplished without stopping the stitching mechanism.

In order to properly guide the fabric and support the same for the action of the folder thereon, we may desire to use a folder 38 which is formed with a supporting ledge 39, said ledge being tapered as at 40 so as to allow the edge of said fabric to be folded underneath said ledge. Said supporting ledge is positioned so that the folding finger moves from a point above the same as shown in Fig. 8, to a point underneath the same, as shown in Fig. 9, and thus carries the edge of the fabric underneath the supporting ledge.

The body fabric may be fed underneath the supporting ledge as shown in Fig. 6, so that the folding strip of fabric may be stitched thereto. The operation of our device will be obvious from the above description. The folding finger is caused to move in a plane at substantially right angles to the line of feed and engage the upper edge of the fabric to be folded, force the same downwardly, and then underneath the supporting ledge, and as the fabric leaves the supporting ledge, the fabric will be folded underneath in position to be stitched to the body fabric. This folding finger operates at each stitch, and may be readily controlled

by the operator so that its stroke may be varied or the action thereof caused to cease, at any time without stopping the stitching mechanism.

It is obvious that various changes in the details of construction and the arrangement of parts, may be made without departing from the spirit of our invention, as set forth in the appended claims.

Having thus particularly described our invention, what we claim as new and desire to secure by Letters Patent, is:—

1. The combination of stitch forming mechanism, of a folding finger located in advance of the stitch forming mechanism, means for operating said folding finger in a plane substantially at right angles to the line of stitching for folding an edge of fabric and means for rendering said folding finger ineffective without stopping the stitch-forming mechanism.

2. The combination of stitch forming mechanism, of a fabric support located in advance of the stitch forming mechanism, a folding finger, means for operating said folding finger from a point above to a point underneath said fabric support, for folding the edge of a fabric on said support underneath the same and means for rendering said folding finger ineffective without stopping the stitch-forming mechanism.

3. The combination of stitch forming mechanism and a work support, a fabric support in advance of the stitch forming mechanism and spaced above said work support, a folding finger, means for moving said folding finger in a plane substantially at right angles to the line of stitching, and from a point above the fabric support, to a point underneath the same, for folding the edge of the fabric underneath said fabric support and means for rendering said folding finger ineffective without stopping the stitching mechanism.

4. The combination of a driving shaft, a work support, stitch forming mechanism, a fabric support in advance of the stitch forming mechanism, a folding finger movable in a plane substantially at right angles to the line of stitching, and means connected with the driving shaft for operating said folding finger, and devices whereby said folding finger may be rendered ineffective without stopping the stitching mechanism.

5. The combination of a driving shaft, a work support, stitch forming mechanism, a fabric support in advance of the stitch forming mechanism and spaced above the work support, a folding finger, devices connecting the driving shaft to the folding finger, said devices being constructed and arranged to move said folding finger bodily up and down and laterally at the lower end of its stroke, whereby the edge of a fabric on said fabric support may be folded underneath the same, and means for stopping said folding finger at the upper end of its stroke, without stopping the stitching mechanism.

6. The combination of stitch forming mechanism, a driving shaft, a folding finger in advance of the stitch forming mechanism, a bar to which said folding finger is attached, a rock lever on which said bar is pivoted, a cam plate for oscillating said rock lever and said bar, and devices connected to the driving shaft for reciprocating said cam plate.

7. The combination of stitch forming mechanism, a folding finger in advance of the stitch forming mechanism, a bar to which said folding finger is attached, a rock lever on which said bar is pivoted, a cam plate for oscillating said rock lever and said bar, a driving shaft, devices connected to the driving shaft for reciprocating said cam plate, and means whereby the reciprocation of said cam plate may be stopped without stopping the stitch forming mechanism.

8. The combination with stitch forming mechanism, of a folding finger in advance of the stitch forming mechanism, a bar supporting said folding finger, a rock lever on which said bar is pivoted, a cam plate having a cam slot for oscillating the bar on said rock lever, and a second cam slot for oscillating said rock lever, a driving shaft, and devices connecting the driving shaft with said cam plate, for reciprocating the same.

9. The combination with stitch forming mechanism, of a folding finger in advance of the stitch forming mechanism, a bar supporting said folding finger, a rock lever on which said bar is pivoted, a cam plate having a cam slot for oscillating the bar on said rock lever, and a second cam slot for oscillating said rock lever, a driving shaft, devices connecting the driving shaft with said cam plate for reciprocating the same, and means for stopping said cam plate without stopping the stitch forming mechanism.

In testimony whereof we affix our signatures, in presence of two witnesses.

JAMES R. MOFFATT.
RALPH S. KELSO.

Witnesses:
CHESTER MCNEIL,
FRANCIS S. NORTH.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."