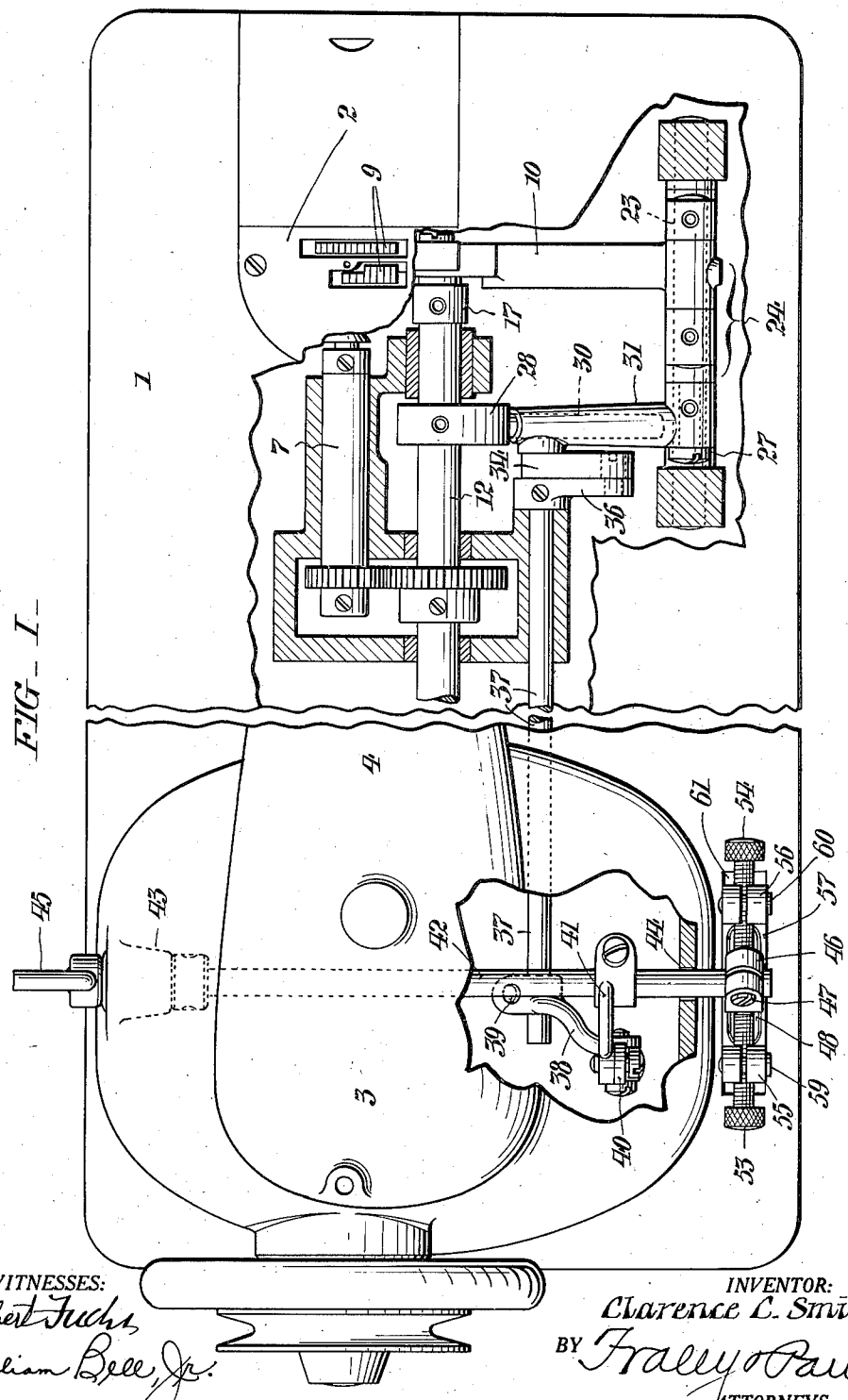
Oct. 27, 1936. C. C. SMITH 2,058,837

FEED CONTROL FOR SEWING MACHINES

Filed Jan. 15, 1935 2 Sheets-Sheet 1

FIG. 1



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FIG. II

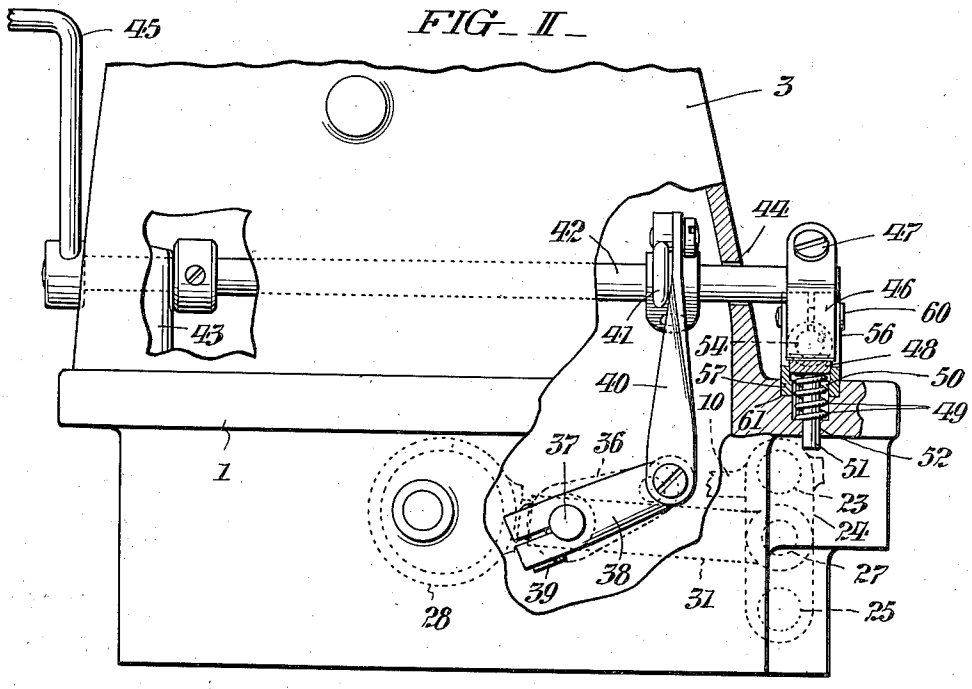


FIG. III

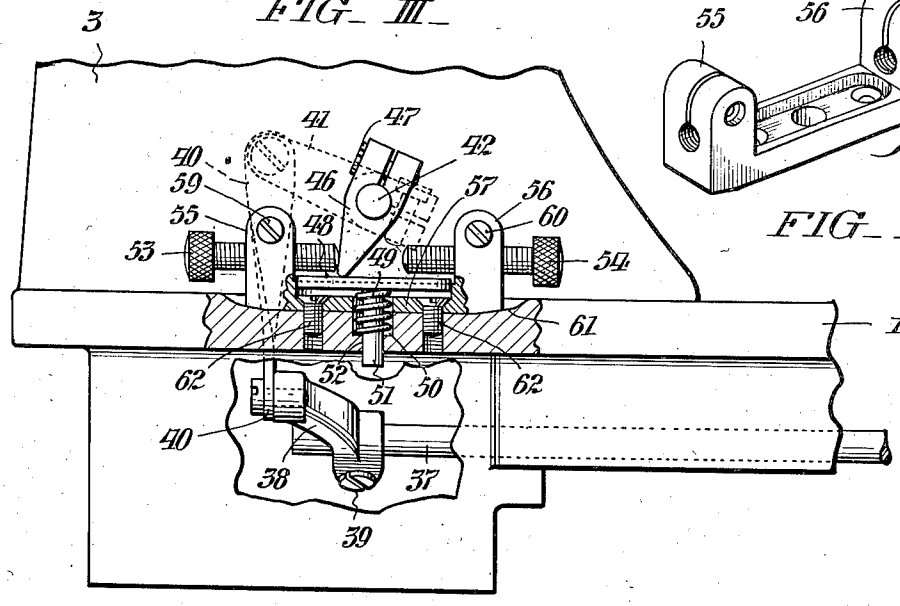


FIG. IV

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UNITED STATES PATENT OFFICE

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FEED CONTROL FOR SEWING MACHINES

Clarence C. Smith, Chicago, Ill., assignor to Union Special Machine Company, Chicago, Ill., a corporation of Illinois

Application January 15, 1935, Serial No. 1,880

10 Claims. (Cl. 112—210)

This invention relates to apparatus for controlling the feeding mechanism of a sewing machine, and more particularly to apparatus for controlling the stitch length, or the direction of feed, or both, of such nature that the operator may quickly shift the feeding mechanism from one predetermined condition of operation to another.

The invention is especially applicable to lock-stitch sewing machines where it is desirable for certain types of work, such as the sewing of cuffs and collars, to effect rapid changes in the direction of feed or in the stitch length, or to effect combinations of different stitch lengths and opposite directions of feed, by comparatively simple manual operations.

One object of the invention is to provide apparatus of the above nature which is of simple and inexpensive construction and capable of being readily incorporated in a sewing machine.

More specific objects of the invention include the provision of various means for adjusting the control mechanism to suit different conditions and to give a wide range of operation, as well as the convenient location of the operating mechanism and the parts which require periodic adjustment.

Other objects and advantages characteristic of my present invention will become more fully apparent from the description hereinafter set forth of one embodiment or example of the practice thereof, having reference to the accompanying drawings. Of the drawings:

Fig. I represents a plan view of a sewing machine, with portions thereof broken away for clearness of illustration, equipped with a feed control of my invention.

Fig. II represents an end view of the lower portion of the machine with a part of the standard cut away to show the mechanism within the standard.

Fig. III represents a rear view of the supporting bed and the lower part of the standard, with a portion thereof cut away; and,

Fig. IV represents a perspective view of a bracket member which carries screws for effecting an adjustment of the feed control.

In the drawings, the invention is shown as applied to a conventional lock stitch sewing machine, which is provided with a supporting bed 1 carrying a throat plate 2. Attached to the bed 1 there is a hollow standard 3 with an overhanging arm 4 which carries the usual mechanism for actuating the needle bar. Complementary stitch forming mechanism including a rotary hook driven by a shaft 7 is disposed beneath the work support.

In the illustrated example the feeding mechanism is similar to that shown in the pending application for U. S. Letters Patent, Serial No. 673,738, filed May 31, 1933, of George Sauer and Clarence C. Smith. As shown in Fig. I, material is fed across the supporting bed by a feed dog 9 carried by a feed bar 10. Beneath the supporting bed 1 is an operating shaft 12 which terminates adjacent to the feed bar 10. Vertical movement is imparted to the feed bar 10 by means of a link 17, one end of which is eccentrically attached to the operating shaft 12. The feed bar 10 is mounted for swinging movement on a rod 23 forming a part of a feed rocker 24. Horizontal movement is imparted to the feed dog 9 by means of an oscillating rod 25, which derives its movement through an oscillating sleeve 31, which is connected by a pin 27 to the feed rocker 24. The movement of the sleeve 31 is derived from an eccentric 28 on the operating shaft 12. The eccentric 28 actuates a rod 30 which telescopes within the sleeve 31. By means of the above described mechanism, there is produced a four-motion feed.

For the purpose of controlling the horizontal movement of the feed dog 9, and thus to determine the stitch length, and the direction of feed, there is employed a control shaft 37. This shaft 37 is connected to the sleeve 31 by means of a link 34 and a crank arm 36. As more fully explained in the pending application referred to above, the angular position of the control shaft 37 determines the direction and extent of movement of the feed dog 9.

In accordance with the practice of the present invention, the control shaft 37, or a shaft having a similar function, is actuated by a device which permits the operator to quickly shift its angular position from one point to another. In the particular example illustrated, the control shaft 37 extends longitudinally beneath the bed 1 to a point within the base of the hollow standard 3. On the end of the control shaft 37 there is provided, as shown in Figs. II and III, a crank arm 38, which is preferably bifurcated and adjustably clamped to the shaft by means of a screw 39. Connected to the free end of the crank arm 38 is a link 40 having an intermediate twisted portion. The link 40 at its other end is joined to a crank arm 41 on a rock shaft 42. The rock shaft 42 extends transversely through the hollow standard 3 and is journaled in bearings 43, 44. Outside the front wall of the stand-

ard 3 the rock shaft 42 is provided with a crank handle 45 by which the operator controls the feeding mechanism. In an obvious manner angular movement of the crank handle 45 produces rotation of the rock shaft 42, which in turn produces rotation of the control shaft 37, the extent of this rotation determining the action of the feed dog 9.

Outside the rear wall of the standard 3, the rock shaft 42 carries an arm 46 which is desirably wedge-shaped at its free end and bifurcated at its fixed end in such manner that it may be adjustably clamped to the shaft 42 by means of a screw 47. The pointed end of the arm 46 is maintained at all times in engagement with a flat plate 48 which is urged upwardly by means of a spring 49 located in a recess 50 in the supporting bed 1 of the machine. Movement of the spring-urged plate 48 is guided by means of a pin 51 which is attached to the plate and disposed centrally within the spring 49 and which engages within a hole 52 in the bed 1.

Movement of the wedge shaped arm 46, and consequently movement of the rock shaft 42, is limited by stops in the form of knurled screws 53, 54 mounted respectively in upstanding lugs 55, 56 on a bracket member 57, shown most clearly in Fig. IV. The bracket member 57 has a body portion countersunk to correspond to the exterior contour of the spring-urged plate 48. Set screws 59, 60 are employed to hold the stop screws 53, 54 in adjusted positions. The bracket member 57 is secured within a recess 61 in the supporting bed 1 of the machine frame by screws 62.

The above described adjusting mechanism provides a means whereby the length of stitch may be quickly shifted from one to another of two selected conditions with the same direction of feed, or alternatively a means whereby the feed dog may be adjusted for a predetermined stitch length in one direction, and the same or a different stitch length in the opposite direction. In other words, with the screws 53 and 54 set as illustrated in Fig. III, the shaft 37 will be turned through an angle such that the pivotal connection between the link 34 and the arm 36 will be moved to a position below the plane through the axes of the shafts 12 and 37, corresponding substantially to that which it now occupies above said plane. Under this changed condition, the size of the stitch will be substantially the same as before but the direction of the feed reversed. Again, by adjusting one or the other of the screws 53 and 54 the relative sizes of the stitches may be changed still with reversal of the direction of feed when the shaft 42 is swung in opposite directions. On the other hand, by adjusting the screw 54, for example, so as to increase the throw of the finger 46 but with the pivotal connection between the link 34 and the arm 36 maintained above the plane through the axes of the shafts 12 and 37, the length of the stitch will be increased without change in the direction of the feed when the finger 46 is swung into contact with said screw 54. Thus with the parts arranged as illustrated, the link 34 will occupy a neutral position when the finger 46 is vertical under which circumstances no feeding will occur. However, by substituting a shorter arm of a proper length for the one indicated at 41, the range of movement of the link 34 may be confined to one side of the plane extending through the axes of the shafts 12 and 37, so that swinging of the finger between the stops 53 and 54 will result in change of stitch length without reversal of the feed, as explained more fully below. When the rock shaft 42 is rotated by means of the crank handle 45 in either direction, so that the pointed end of the wedge-shaped arm 46 passes through the vertical position, the upward pressure of the spring urged plate 48 will throw the wedge-shaped member 46 into engagement with the end of one of the stop screws 53, 54 and maintain it in firm contact with the particular stop screw toward which it is moved. The spring-urged plate 48 thus tends to hold the rock shaft 42 and the crank handle 45 at their limits of movement.

Where the range of operation is between two stitch lengths in one direction, and the difference between the two stitch lengths is very small, it may be desirable to obtain a greater angular movement of the rock shaft 42 to produce a more positive operation than can be obtained with the particular mechanism which is shown in the drawings; and in such case the crank arm 41 may be removed, and a shorter crank arm substituted therefor. Preferably the part 41 is made so that it is readily removable, and it is supplied in several different lengths for such a purpose. Manifestly the shorter the length of the crank arm 41, the more movement of the shaft 42 will be required to effect a given movement of the control shaft 37.

To initially adjust the above mechanism, the shaft 42 is first moved to a position substantially midway of the desired stitch lengths. Then the wedge-shaped member 46 is shifted angularly about the axis of the shaft 42 to a vertical position. Subsequently the stop screws 53, 54 are set and locked at the proper positions to produce the stitch lengths and the direction of feed that is desired.

From the above description it will be observed that the feed control mechanism of this invention may be adjusted to suit a variety of conditions and to give a wide range of operation. The crank handle 45 is conveniently located in front of the operator, and may be actuated by a very simple movement. On account of the pressure of the spring plate 48, the crank handle will always move to the limit of its travel in the direction in which it is urged. Of course, numerous other devices may be substituted for the crank handle 45, and in using the term "manually operated devices" herein, I mean to include any form of device operated by the hand or foot of the operator.

Moreover, while I have shown one specific form which the control mechanism of this invention may take, it will be apparent that numerous changes may be made in the particular apparatus illustrated herein without departing from the spirit of my invention as defined in the annexed claims.

Having thus described my invention, I claim:

1. In a sewing machine having a feeding mechanism, including a stitch length controlling member, adjustable means establishing limits for the movement of said member corresponding to predetermined stitch lengths, a manually operated device for moving said member between said limits, and means tending to hold said manually operated device at its limits of movement.

2. In a sewing machine having a feeding mechanism, including a member for controlling the stitch length and the direction of feed, adjustable means establishing limits for the movement of said member, a manually operated de-

vice for moving said member between said limits to vary the stitch length or the direction of feed, and means tending to hold said manually operated device at its limits of movement.

3. In a sewing machine having a feeding mechanism including a rotary shaft for controlling the stitch length, adjustable stops establishing limits for the rotation of said shaft corresponding to predetermined stitch lengths, a manually operated device for rotating said shaft between said limits, and spring-urged means tending to hold said manually operated device at its limits of movement.

4. In a sewing machine having a work support, a hollow standard, and an arm carried by the standard and overhanging the work support, feeding mechanism disposed beneath the work support and including a rotary shaft extending into said standard and serving to control the stitch length or the direction of feed, a second shaft extending transversely through said standard and connected to said first shaft, adjustable means on one side of said standard establishing limits for the rotation of said second shaft, and manually operated means at the other side of said standard for moving said second shaft between said limits.

5. In a sewing machine having a feeding mechanism, including a shaft for controlling the stitch length and the direction of feed, adjustable means establishing limits for the movement of said shaft, means including a crank handle for moving said shaft between said limits to vary the stitch length or the direction of feed, and means tending to hold said crank handle at its limits of angular movement.

6. In a sewing machine having a feeding mechanism, including a shaft for controlling the stitch length or the direction of feed, means establishing limits for the movement of said shaft comprising an arm projecting radially from said shaft and adjustably secured thereto, and oppositely disposed adjustable stops restricting angular movement of said arm, a manually operated device for moving said shaft between said limits, and means tending to hold said shaft at its limits of movement.

7. In a sewing machine having a feeding mechanism, including a shaft for controlling the stitch length or the direction of feed, means establishing limits for the movement of said shaft comprising an arm projecting radially from said shaft, and oppositely disposed adjustable stops restricting angular movement of said arm, a manually operated device for moving said shaft between said limits, and a spring-urged plate bearing against the end of said projecting arm and tending to maintain said arm in contact with either of said adjustable stops.

8. In a sewing machine having a feeding mechanism including a rotary shaft for controlling the stitch length, a second rotary shaft adjustably connected to said first shaft, adjustable means establishing limits for the rotation of said second shaft corresponding to predetermined stitch lengths, a manually operated device for rotating said second shaft between said limits, and means tending to hold said second shaft at its limits of rotation.

9. In a sewing machine having feeding mechanism with a stitch length controlling member, adjustable means establishing limits for the movement of said member corresponding to predetermined stitch lengths, means for moving said member between said limits, and means tending to hold the member at its limits of movement.

10. In a sewing machine having feeding mechanism with a stitch length controlling member, adjustable means establishing limits for the movement of said member, means for moving said member between said limits to vary the stitch length or the direction of feed, and means tending to hold the member at its limits of movement.

CLARENCE C. SMITH.