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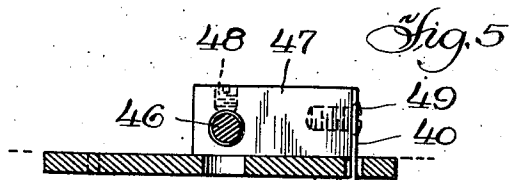
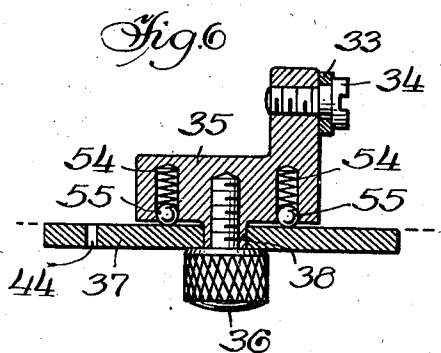
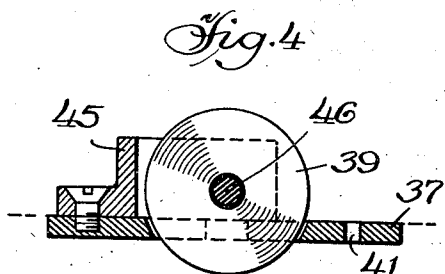
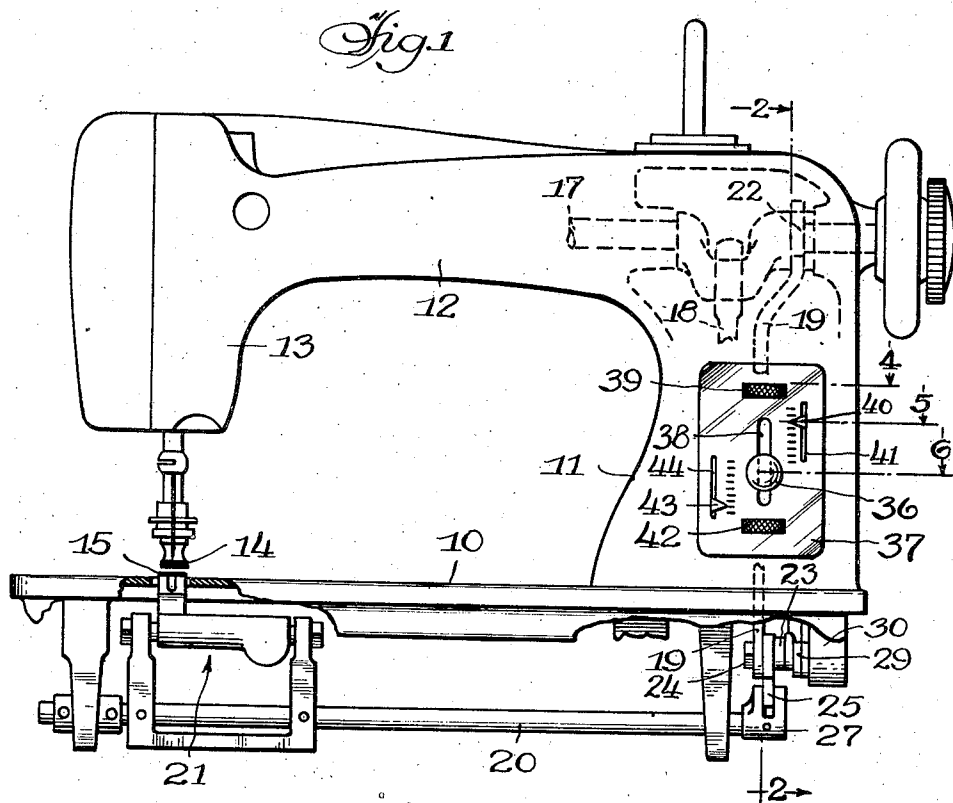
C. S. BEST

2,430,207

SEWING MACHINE

Filed May 21, 1945

2 Sheets-Sheet 1



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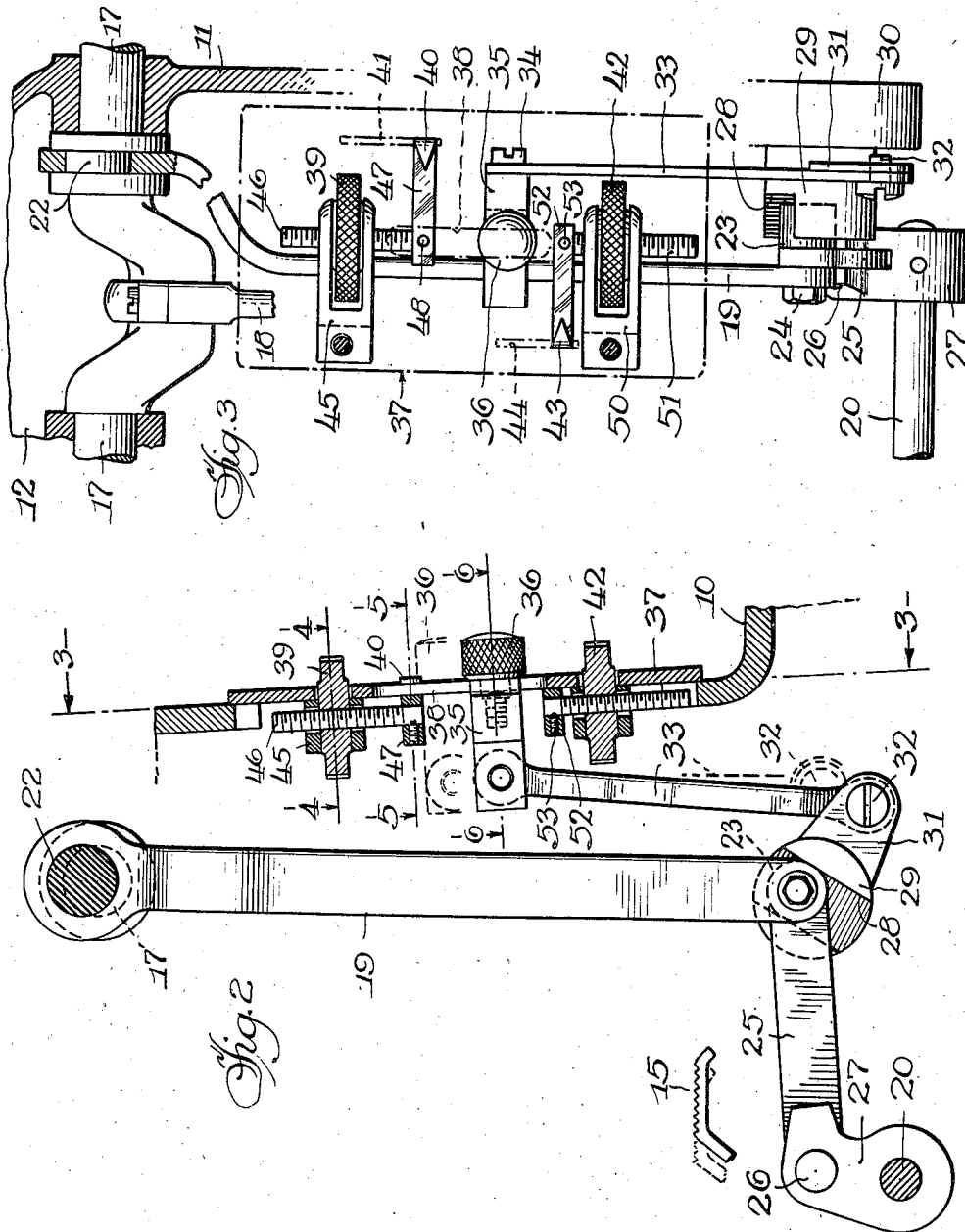
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UNITED STATES PATENT OFFICE

2,430,207

SEWING MACHINE

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5 Claims. (Cl. 112—210)

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This invention relates to improvements in sewing machines and particularly to improvements in mechanism for independently adjusting the stitch length in regular and reverse sewing operations.

The main object of the invention is to provide, in a sewing machine constructed for reverse sewing, independently operable means for independently adjusting and controlling the stitch length when the cloth is moved away from the operator, as in ordinary sewing, and when the cloth is moved toward the operator, as in reverse sewing.

Another object is to provide independent adjusting and control means for the purpose stated, whereby the number of stitches per inch for sewing in one direction may differ from the number of stitches per inch for sewing in the opposite direction, a result not obtainable when a single adjusting means is provided.

Another object is to provide adjusting means which function accurately and dependably in controlling stitch lengths selected for either direction of sewing.

In the drawings:

Fig. 1 is an elevational view of a sewing machine embodying my invention.

Fig. 2 is an enlarged, fragmentary, transverse, vertical sectional view, taken in the plane of the line 2—2 of Fig. 1, looking in the direction indicated by the arrows, with parts of the housing eliminated.

Fig. 3 is a vertical sectional view, taken longitudinally of the machine, in the plane of the line 3—3 of Fig. 2, looking in the direction indicated by the arrows.

Figs. 4, 5 and 6 are horizontal sectional views of details of the adjustment mechanism, taken in the planes of the lines 4—4, 5—5, and 6—6, respectively, of Figs. 1 and 2.

Conventional parts of the sewing machine, shown in the drawings, are the bed plate 10, upright standard 11, overhanging arm 12, sewing head 13, presser foot 14 and feed dog 15, the latter being mounted in the bed plate 10 for the conventional horizontal reciprocating movement combined with the usual rise and fall motion, as is well understood in the art.

In the upright standard and overhanging arm are shown, in dotted lines, the main or needle operating shaft 17, the vertical connecting rod 18 which is operatively connected with the hook shaft (not shown), and the vertical link 19 for operating the feed rock shaft 20 beneath the bed plate 10. The operative connections between the rock shaft 20 and the feed dog 15 for imparting

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reciprocating feed and return or push and pull motions to said feed dog 15 do not constitute part of the invention, per se, and therefore will be indicated as a whole at 21 in Fig. 1, without detailed description. Suffice to say that the extent of the feed movements imparted to the feed dog 15 controls the stitch length, i. e., the number of stitches per inch of sewing, and the extent of such feed movements is determined by the degree of rocking motion given the shaft 20, as will be explained hereinafter.

The main shaft 17 may be driven from an electric motor (not shown) or any suitable source of power. It actuates the link 19 through the eccentric 22. On the lower end of the link 19 there is rotatably mounted the roller 23 by means of a bolt or pivot pin 24, and between the roller 23 and link 19, also pivotally mounted on the pin 24, is a link 25 which in turn is pivotally connected at 26 to the bifurcated member 27 in which is fixedly mounted the rock shaft 20. The roller 23 has rolling movement in the slot 28 of the reversing bracket 29 which is pivotally mounted on a fixed part 30 of the machine.

The reversing bracket 29, through an extension arm 31, is pivotally connected at 32 to the reversing link 33 which is pivotally connected at 34 to the block 35 in which the reversing control button 36 is mounted. A plate 37 carries the manually operable adjusting means and is located between said block 35 and button 36. The plate 37 is mounted on the standard 11, and is slotted at 38, permitting the button 36 and block 35 to be moved up and down in the slot 38.

The operative connections described between the power shaft 17 and the rock shaft 20 impart rocking movement to said shaft. The mechanism between the reversing button 36 and the slotted bracket 29 functions to alter and adjust the angular position of the slot 28 in the bracket 29, and, therefore, because of the engagement between the roller 23 and the slot 28, the extent of rocking movement imparted to the rock shaft 20 is controlled by the position of the button 36 in the slot 38.

When the button 36 is above the center of the slot 38 in the plate 37, the links 31 and 33 assume the dotted line positions of Fig. 2, reversing the angular position of the slot 28 in bracket 29, and thereby altering the angle on which the shaft 20 is rocked. This adjustment of the button 36 to a position above the center of the slot 38 and consequent adjustment of the angle on which the rock shaft 20 is rocked causes the cloth pushing action of the feed dog 15 to take place when the

feed dog is traveling toward the operator, as in reverse sewing, and when the button 36 is moved downwardly below the center of the slot 38, the adjustment of the angle of the slot 28 to the position shown in Fig. 2 and the consequent adjustment of the angle on which the rock shaft 20 is rocked causes the cloth pushing action of the feed dog 15 to take place when the feed dog is traveling away from the operator, as in regular sewing.

The size of each stitch and consequently the number of stitches per inch of sewing, is controlled by the extent of the rocking movement imparted to the shaft 20 and through it to the feed dog 15 in the form of reciprocating feed and return motions. The stitch size control is accomplished in my invention by independent adjustment means for the forward and the backward sewing. From the face of the control plate 37, the adjustment means appear in the form of the knurled disc or thumb wheel 39, pointer 40 movable in slot 41, for the reverse stitch control, and the knurled disc 42, pointer 43 movable in slot 44, for the regular sewing stitch control.

The thumb wheel 39 is mounted for manual rotation in a bifurcated block 45 fixed to the plate 37. A screw threaded rod 46 extends through the block 45 and disc 39. The lower end of the rod 46 has fixedly mounted thereon a plate 47 by means of a set screw 48. The plate 47 has fixed to it, by a screw 49, the pointer 40.

The disc or thumb wheel 42 is similarly mounted for manual rotation in a bifurcated block 50 fixed to the plate 37. A screw threaded rod 51 extends through the block 50 and disc 42. The upper end of the rod 51 has fixedly mounted thereon a plate 52 by means of a set screw 53. The plate 52 has fixed to it the pointer 43.

The block 35 in which is mounted the button 36 has been previously mentioned. It is provided with two recesses in which are mounted springs 54 and ball detents 55 which bear against the inner surface of the plate 37 and frictionally hold the block 35 and button 36 in selected position relatively to the plate 37, and thereby determine the position of the reversing link 33, reversing bracket 29 and slot 28.

To adjust the stitch length, the operator actuates the knurled disc 39 to move the pointer 40 in slot 41, and actuates the knurled disc 42 to move the pointer 43 in slot 44. This moves the plates 47 and 52, respectively, as best shown in Fig. 2, and positions these plates and the pointers attached thereto, to indicate the desired number of stitches shown on the upper and lower scales on the plate 37. For reverse sewing, the operator moves the control button 36 as far upwardly as possible, that is, until the block 35 contacts the plate 47, whereupon the machine will form the number of stitches per inch selected by the operator when adjusting the pointer 40. For regular sewing, the button 36 is moved downwardly as far as possible, until the block 35 contacts the plate 52, whereupon the machine will form the number of stitches per inch selected by the operator when adjusting the pointer 43.

It will be understood from the foregoing, that the position of the button 36 above or below the center of the slot 38, through the connections between the button and the rock shaft 20, and particularly on account of the angular position of the slot 28 in the reversing bracket 29, will adjust the rocked position of the shaft 20 to one side or the other of center, and thereby control the horizontal or feed motions of the feed dog as correlated to the rise and fall of the feed dog 15. It

will further be understood that after the slot 28 has been positioned to one side or the other of center, by the adjustment of the button 36 above or below center of the slot 38, the stitch length or extent of movement of the feed dog in each stitch forming cycle is determined by the exact angle at which the slot 28 of the reversing bracket 29 has been fixed by moving the button 36 to a selected spot on the selected scale. After the pointers 40 and 43 have been positioned opposite the selected stitch indications on the scales on the plate 37, the operator need only move the button 36 up or down as far as the plates 47 and 52 permit, to sew in one direction or the other at the selected number of stitches per inch.

Changes may be made in the form of parts and in details of construction without departing from the scope of my invention as set forth in the appended claims.

I claim:

1. A sewing machine having a feed mechanism and means for reversing the direction of feed, provided with independently adjustable means for controlling stitch length for sewing in opposite directions, comprising a feed rock shaft, reversing means for controlling the extent of rocking movement and position of the feed shaft operatively connected with said shaft, and means for adjusting the angular position of the reversing means on either side of center, said adjusting means comprising a slotted plate mounted on a fixed part of the machine, a movable block frictionally engaging said slotted plate, said movable block being operatively connected to the reversing means, manually adjustable members mounted in said plate at opposite sides of said movable block establishing limits of movement for said block, and means on the block movable in the slotted plate for moving said block between said manually adjustable members, each of said manually adjustable members comprising a fixed support mounted on the slotted plate, a thumb wheel rotatably mounted in the fixed support and accessible from the face of the plate, a screw threaded rod extending through a threaded aperture in the thumb wheel and the fixed support, an indicator fixedly mounted on the rod and a stitch length scale on the face of the slotted plate adapted to be traversed by said indicator when the rod is moved in its support by actuation of the thumb wheel.

2. A sewing machine having a feed mechanism and means for reversing the direction of feed, provided with independently adjustable means for controlling stitch length for sewing in opposite directions, comprising a feed rock shaft, reversing means for controlling the extent of rocking movement and position of the feed shaft operatively connected with said shaft, and means for adjusting the angular position of the reversing means on either side of center, said adjusting means comprising a slotted plate mounted on a fixed part of the machine, a movable block frictionally engaging said slotted plate, said movable block being operatively connected to the reversing means, manually adjustable members mounted in said plate at opposite sides of said movable block establishing limits of movement for said block, and means on the block movable in the slotted plate for moving said block between said manually adjustable members, each of said manually adjustable members comprising a bifurcated supporting member fixedly mounted on the slotted plate, a thumb wheel rotatably mounted in the bifurcated member and acces-

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sible through a slot in the plate, a screw threaded rod extending through said bifurcated member and a threaded aperture in the thumb wheel, an indicator fixedly mounted on the rod and extending through a slot in the plate to the face thereof, and a stitch length scale on the face of the plate adapted to be traversed by said indicator when the rod is moved in its support by actuation of the thumb wheel.

3. A sewing machine having a feed mechanism and means for reversing the direction of feed, provided with independently adjustable means for controlling stitch length for sewing in opposite directions, comprising a feed rock shaft, reversing means for controlling the extent of rocking movement and position of the feed shaft operatively connected with said shaft, and means for adjusting the angular position of the reversing means on either side of center, said adjusting means comprising a slotted plate mounted on a fixed part of the machine, a movable block frictionally engaging said slotted plate, said movable block being operatively connected to the reversing means, manually adjustable members mounted in said plate at opposite sides of said movable block establishing limits of movement for said block, and means on the block movable in the slotted plate for moving said block between said manually adjustable members, said movable block being provided with recesses and spring pressed detents in said recesses frictionally bearing on the inner surface of said slotted plate for retaining the block in adjusted position relatively to the plate and thereby holding the reversing means in selected position.

4. A sewing machine having a feed mechanism and means for reversing the direction of feed, provided with independently adjustable means for controlling stitch length for sewing in opposite directions, comprising a feed rock shaft, reversing means for controlling the extent of rocking movement and position of the feed shaft operatively connected with said shaft, and means for adjusting the angular position of the reversing means on either side of center, said adjusting means comprising a slotted plate mounted on a fixed part of the machine, a movable block frictionally engaging said slotted plate, said movable block being operatively connected to the reversing means, manually adjustable members mounted in said plate at opposite sides of said movable block establishing limits of movement

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for said block, and means on the block movable in the slotted plate for moving said block between said manually adjustable members, said movable block being provided with spring pressed means bearing on the inner surface of the slotted plate, and a control button mounted in the block and extending through the slotted plate for manipulation on the outer side of the plate, said spring pressed means retaining the block in adjusted position relatively to the plate and thereby holding the reversing means in selected position.

5. A sewing machine having a feed mechanism and means for reversing the direction of feed, provided with independently adjustable means for controlling stitch length for sewing in opposite directions, comprising a feed rock shaft, a slotted plate mounted on a fixed part of the machine, a movable block frictionally engaging said slotted plate, operative connections between the movable block and the feed rock shaft for adjusting the extent of rocking motion of the shaft and its angular position to one side or the other of center, means for manually moving the block, and manually adjustable members mounted in said slotted plate at opposite sides of said movable block establishing the limits of movement of said block, said manually adjustable members each comprising a fixed support mounted on the slotted plate, a thumb wheel rotatably mounted in the fixed support and accessible from the face of the plate, a screw threaded rod extending through a threaded aperture in the thumb wheel and the fixed support, an indicator fixedly mounted on the rod and a stitch length scale on the face of the slotted plate adapted to be traversed by said indicator when the rod is moved in its support by actuation of the thumb wheel, said movable block being provided with spring pressed means frictionally bearing on the inner surface of the slotted plate for retaining the block in adjusted position.

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