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SEWING MACHINE HAVING DOUBLE STITCH FINGERS

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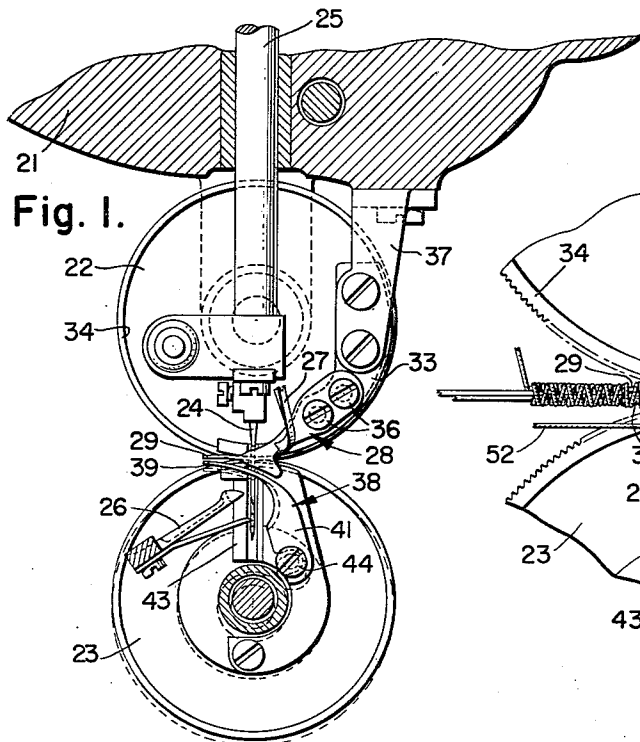


Fig. 1.

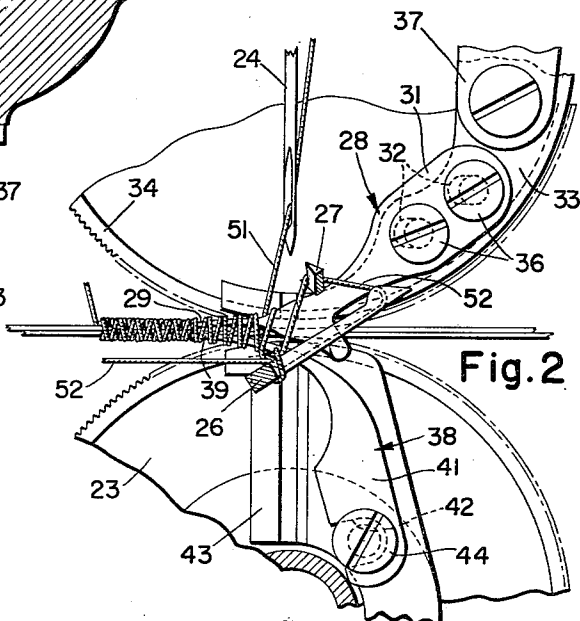


Fig. 2.

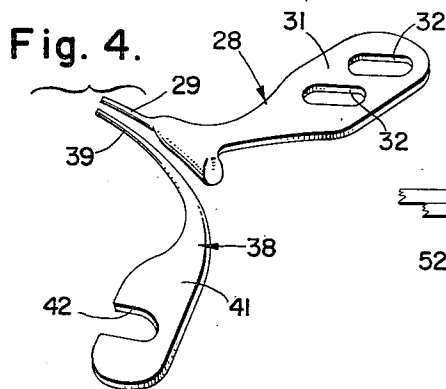


Fig. 4.

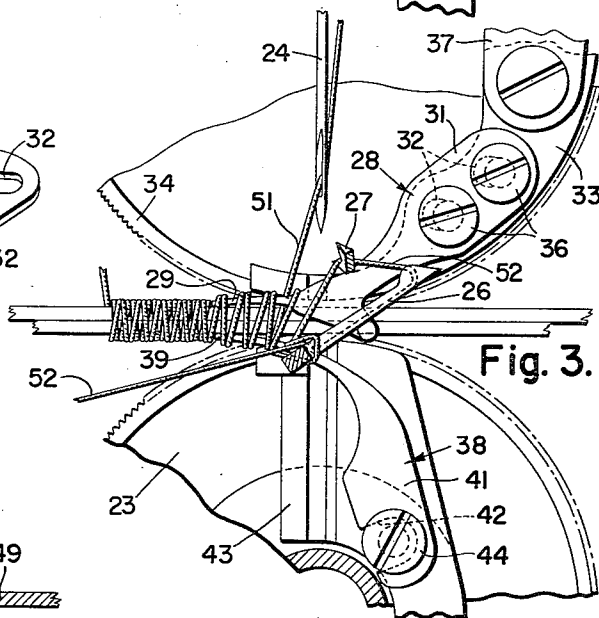


Fig. 3.

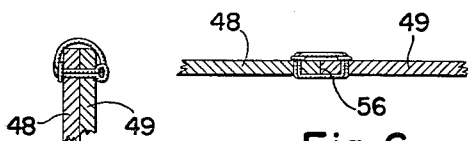


Fig. 5.

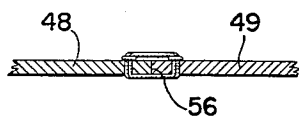


Fig. 6.

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SEWING MACHINE HAVING DOUBLE STITCH FINGERS

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This invention relates to sewing machines and more particularly to improved means for sewing with controlled quantities of thread contained in the stitches and also to improved means for producing invisible seams on full fashioned hosiery.

In the seaming of hosiery, it has been customary to use a sewing machine of the type wherein the material being stitched is supported and fed through the sewing machine by feed wheels or "cups." A sewing machine of this general type is shown in United States Patent No. 2,334,672, issued November 16, 1943. In the past, it has been customary to provide sewing machines of the type shown in Patent No. 2,334,672, with a plurality of different sized stitch fingers which, except for size, were identical. If tight stitches were desired, a small stitch finger would be selected and installed on the sewing machine. If loose stitches were desired, a larger stitch finger would be selected and installed. The present invention contemplates the provision of a pair of stitch fingers mounted so that they can be moved relatively to each other in such a manner as to permit the production of tight or loose stitches. Then if tight stitches are desired, the two fingers are moved close together, and if loose stitches are desired, the two fingers are moved farther apart. In addition to this, the present invention contemplates the provision of means whereby the pair of small stitch fingers can be moved toward or away from one another while the sewing operation is being performed, thus making it possible selectively to vary the stitches depending on the thickness of the material being sewn. In addition to the use of double stitch fingers with sewing machines having feed wheels or "cups," the double stitch fingers of the present invention are useful with many other types of sewing mechanisms. For example, there is a distinct advantage in incorporating the herein described and claimed double stitch finger as a part of an overedging sewing machine of the type shown in the United States Patent No. 2,238,796. There is also an advantage in using the subject double stitch fingers as part of sewing attachments of the type shown in the United States Patent No. 2,063,845. Double stitch fingers are also useful in straight stitching sewing machines of the type shown in the United States Patent No. 2,219,460. In other words, the double stitch finger herein described and claimed have general use. Therefore, one of the primary objects of the present invention is to provide improved stitch fingers adapted for use with various types of sewing mechanisms.

A further primary object of the present invention is to provide an improved cup or wheel feed sewing machine.

Another object of the invention is to provide an improved sewing machine having double stitch fingers.

A further object of the invention is to provide an improved means for mounting a pair of stitch fingers on a cup-feed sewing machine.

A still further object of the invention is to provide an improved means for adjustably mounting stitch fingers so that tight or loose seams can be produced at will and also so that the tightness or looseness of the seam can be varied while the sewing operation is in progress of being performed.

With the above and other objects in view, as will hereinafter appear, the invention comprises the devices, com-

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binations, and arrangements of parts hereinafter set forth and illustrated in the accompanying drawings of a preferred embodiment of the invention, from which the several features of the invention and the advantages attained thereby will be readily understood by those skilled in the art.

In the drawings:

FIG. 1 is a fragmentary horizontal sectional view of a cup-feed sewing machine, similar to the sewing machine shown in United States Patent No. 2,334,672, and embodying the present invention,

FIG. 2 is an enlarged view showing a portion of the mechanism of FIG. 1 with the stitch fingers located close together to produce tight stitches,

FIG. 3 is a view similar to FIG. 2, except that the stitch fingers are shown widely spaced, to produce loose stitches,

FIG. 4 is an enlarged perspective view showing the pair of chaining fingers, and

FIGS. 5 and 6 illustrate the seam produced by the mechanism shown in FIGS. 1 to 4, inclusive.

Referring in detail to the drawings, the sewing machine in which one embodiment of the invention is incorporated includes a machine-frame having a standard 21 which rotatably supports on a fixed axis an inner feed-cup 22 which cooperates with an outer feed-cup 23. The two feed-cups 22 and 23 are positively driven in synchronism and are adapted to support and feed the material being sewn past stitch-forming devices.

The stitch-forming devices of the machine illustrated comprise a threaded needle 24 carried by an endwise reciprocatory needle-bar 25, an oscillatory threaded looper 26, and an oscillatory spreader 27. The needle-bar 25, the looper 26, and the spreader 27 are, in a well-known manner, operated by mechanism carried by the standard 21. These parts are properly timed and actuated to form a two-thread overseam.

Cup-feed machines of the type disclosed herein are customarily provided with a single stitch-finger 28 overlying the feed-cups 22 and 23 at the stitching point. The stitch-finger 28 comprises a substantially conical blade 29 formed integral with a shank 31 having a pair of elongated holes 32-32. The shank 31 and thus the blade 29 are adjustably held to a support 33 disposed within an upturned peripheral flange 34 of the inner feed-cup 22 by a pair of screws 36-36. The support 33, in turn, is secured to the standard 21 by means of an angle-bracket 37. As is common in cup-feed machines of the type in question, the stitch-finger overlies the feed-cups 22 and 23 at the stitching point and the stitches produced by the cooperation of the needle 24, looper 26 and spreader 27 are formed and set about the stitch-finger to minimize distortion of the marginal edges of the material being sewn.

In addition to the stitch-finger 28, the present mechanism is provided with a front or outer stitch-finger 38 having an elongated, slightly curved blade 39 formed integral with a shank 41 having an elongated notch 42. The finger 38 is adjustably secured to a movable support member 43 by means of a screw 44 and the notch 42. The support member 43, in a well-known manner, also supports the outer feed-cup 23.

The two edges of the material, which are to be joined by the stitch-forming devices of the machine, are designated by the numerals 48 and 49, and the two threads which eventually form a two-thread overseam are designated by the numerals 51 and 52, the thread 51 being manipulated by the needle 24 and the thread 52 being manipulated by the looper 26 and spreader 27.

In the operation of the machine, the two stitch-fingers 28 and 38 can respectively be adjustably secured in place or opposite sides of the material being sewn by screws 36-36 and 44. When so properly positioned, the blades

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29 and 39 will be substantially parallel to one another. As the sewing machine operates, it forms stitches around the two blades 29 and 39 and through the marginal edges of the material plies, thereby joining the edges 48 and 49 of the two pieces of material. It will be understood that the outer feed-cup 23 is mounted in such a manner as to move toward or away from the feed-cup 22 and, thus when the material between the two cups 22 and 23 is relatively thin, the two cups 22 and 23, as shown in FIG. 2, will be closely adjacent to one another and this causes the blade 39 to move closely adjacent to the blade 29. Under this circumstance, tight stitches are produced by the blades 29 and 39. When the material between the two cups 22 and 23 is relatively thick, the two cups 22 and 23, as shown in FIG. 3, will be relatively far apart, thus causing the blade 39 to move away from the blade 29. Under this circumstance, loose stitches are produced by the blades 29 and 39. From the above, it can be seen that a large variety of tight or loose stitches can be produced. For example, either or both of the stitch-fingers 28 and 38 can be given an initial adjustment by loosening and then tightening screws 36—36 and screw 44. If this adjustment is made with no material between the feed-cups 22 and 23, extremely tight stitches can be produced if the blades 29 and 39 are initially placed very close together. On the other hand, loose stitches can be produced initially if the stitch-fingers 28 and 38 are adjusted in such a manner that the blades 29 and 39 are initially far apart. It is obvious that in the latter instance, much looser stitches will be produced than would have been produced had the blades 29 and 39 been initially set close to one another.

When the mechanism of the present invention is used to seam hosiery, the seam as it comes from the sewing machine is shown in FIG. 5, wherein it will be observed that the two edges of the material 48 and 49 are parallel and the two pieces of material are side by side. The stitches produced by the present sewing machine overseam the two edges of the materials 48 and 49. When the hosiery is shaped on a form, in a well-known manner, the two edges of the material 48 and 49 abut one another as shown at 56 in FIG. 6. In this instance, the stitches hold the two edges of the material 48 and 49 so close together that it is extremely difficult to detect a seam in the hosiery. Because of this, hosiery produced on this machine has the advantage of giving the desirable appearance of seamless hosiery and at the same time has the advantage of proper fit which is a recognized quality of full fashioned hosiery.

The mechanism of the present invention is advantageous because:

(a) One set of stitch-fingers can be used to produce either tight or loose stitches. This eliminates the necessity of providing a sewing machine with a large number of different sized stitch-fingers.

(b) By use of the mechanism of this invention, it is possible to produce a novel, invisible, full fashioned hosiery seam in which adjoined edges lie flat after the hosiery has been shaped.

(c) In view of the fact that the front finger 38 is mounted on the same support member 43 which carries the feed-cup 23, it is evident that the space between the blades 29 and 39 will automatically vary depending on whether thin or thick material is passing between the feed-cups 22 and 23.

Having thus described the nature of the invention, what I claim herein is:

1. A sewing machine having, in combination, stitch-forming devices, a fixed axle, a first feed-cup rotatably mounted on said fixed axle, means for supporting said fixed axle, a first stitch-finger mounted on the means for supporting said fixed axle, a second feed-cup, movable means for rotatably supporting said second feed-cup in such a manner that said second feed-cup can be moved toward or away from said first feed-cup, and a second

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stitch-finger mounted on the movable means for supporting said second feed-cup, at least a portion of said second stitch-finger being placed in adjacent structural relationship to a portion of said first stitch-finger so as to permit said stitch forming devices to form stitches around the outside of both portions of said stitch-fingers taken as a pair.

2. A sewing machine having, in combination, stitch-forming devices, a fixed axle, a first feed-cup rotatably mounted on said fixed axle, means for supporting said fixed axle, a first stitch-finger adjustably mounted on the means for supporting said fixed axle, a second feed-cup, movable means for rotatably supporting said second feed-cup in such a manner that said second feed-cup can move toward or away from said first feed-cup, and a second stitch-finger adjustably mounted on the movable means for supporting said second feed-cup, at least a portion of said second stitch-finger being placed in adjacent structural relationship to a portion of said first stitch-finger so as to permit said stitch forming devices to form stitches around the outside of both portions of said stitch-fingers taken as a pair.

3. A sewing machine having, in combination, stitch-forming devices comprising a needle and a looper, a rotary inner feed-cup, fixed means for supporting said inner feed-cup, a first stitch-finger having a shank and a substantially conical blade, means for adjustably securing the shank of said first stitch-finger to the means for supporting said inner feed-cup, a rotary outer feed-cup, means for supporting said outer feed-cup in such a manner that said outer feed-cup is movable toward or away from said inner feed-cup, a second stitch-finger having a shank and a conical blade, and means for adjustably securing the shank of said second stitch-finger to the means for supporting said outer feed-cup, the conical blade of said second stitch-finger being placed in adjacent structural relationship to the conical blade of said first stitch-finger so as to permit said stitch forming devices to form stitches around the said two conical blades taken as a pair.

4. A sewing machine for stitching material having, in combination, stitch forming instrumentalities, a first feed cup, a second feed cup, a fixed axle for mounting one of said feed cups, a movable axle for mounting the other of said feed cups, a first stitch finger, a second stitch finger at least a portion of said second stitch-finger being placed in adjacent structural relationship to a portion of said first stitch-finger so as to permit said stitch forming instrumentalities to form stitches around the outside of both portions of said stitch-fingers taken as a pair, means for mounting one of said stitch fingers in fixed relation to one of said axles, and means for mounting said second stitch finger in such a manner that said second stitch finger is movable relatively to at least one of said axles.

5. A sewing machine for stitching material having, in combination, stitch forming instrumentalities, a first feed cup, a second feed cup, a fixed axle for mounting one of said feed cups, a movable axle for mounting the other of said feed cups, a first stitch finger, a second stitch finger at least a portion of said second stitch-finger being placed in adjacent structural relationship to a portion of said first stitch-finger so as to permit said stitch forming instrumentalities to form stitches around the outside of both portions of said stitch-fingers taken as a pair, means for mounting said first stitch finger in fixed relation to said fixed axle, and means for mounting said second stitch finger in movable relationship to said fixed axle.

6. A sewing machine having in combination, stitch forming devices, a fixed supporting means, a first feed-cup rotatably supported from said fixed supporting means, a first stitch-finger supported from said fixed supporting means, movable supporting means movable with respect to said fixed supporting means, a second feed-cup rotatably supported from said movable supporting means, and a second stitch-finger supported from said movable supporting means, at least a portion of said second stitch-

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finger being placed in adjacent structural relationship to a portion of said first stitch-finger so as to permit said stitch forming devices to form stitches around the outside of both portions of said stitch-fingers taken as a pair.

7. A sewing machine adapted to sew material and having in combination stitch forming devices, a first stitch-finger adapted to engage the material sewed on one side thereof, and a second stitch-finger adapted to engage the material sewed on the other side thereof, at least a portion of said second stitch-finger being placed in adjacent structural relationship to a portion of said first stitch-finger so as to permit said stitch forming devices to form stitches around the outside of both portions of said stitch-fingers taken as a pair.

8. A sewing machine adapted to sew material and having in combination stitch forming devices, a fixed supporting means, a first stitch-finger supported from said fixed supporting means, and adapted to engage the material sewed on one side thereof, movable supporting means movable with respect to said fixed supporting means, and a second stitch-finger supported from said movable supporting means and adapted to engage the material sewed on the other side thereof, at least a portion of said second stitch-finger being placed in adjacent structural relationship to a portion of said first stitch-finger so as to permit said stitch forming devices to form stitches around the outside of both portions of said stitch-fingers taken as a pair.

9. A sewing machine adapted to sew material and having in combination stitch forming devices, a first work feeding means located on a first side of the material being sewed, a first stitch-finger located on the first side of said material, a second work feeding means located on the

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second side of said material, and a second stitch-finger located on the second side of said material, at least a portion of said second stitch-finger being placed in adjacent structural relationship to a portion of said first stitch-finger so as to permit said stitch forming devices to form stitches around the outside of both portions of said stitch-fingers taken as a pair.

10. A sewing machine adapted to sew material and having in combination a first stitch-finger adapted to engage the material sewed on one side thereof, a second stitch-finger adapted to engage the material sewed on the other side thereof, a plurality of stitch forming devices located above said stitch-fingers and at least a portion of said second stitch-finger being placed in adjacent structural relationship to a portion of said first stitch-finger so as to permit said stitch forming devices to form stitches around the outside of both portions of said stitch-fingers taken as a pair.

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