Jan. 12, 1926. **1,568,986**

J. M. MERROW

SEWING MACHINE

Filed Dec. 17, 1923 2 Sheets-Sheet 1

Fig. 1.

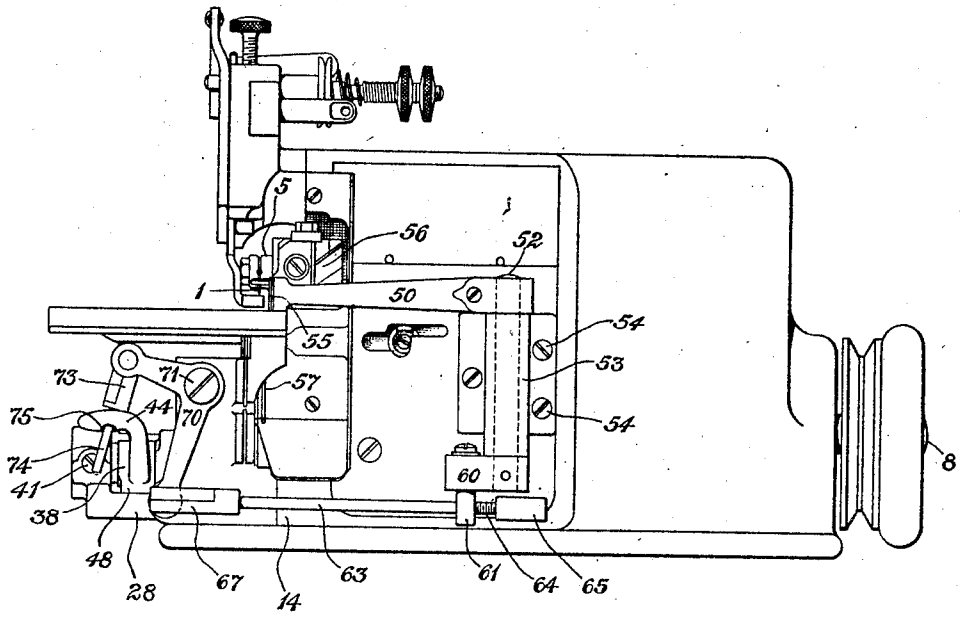
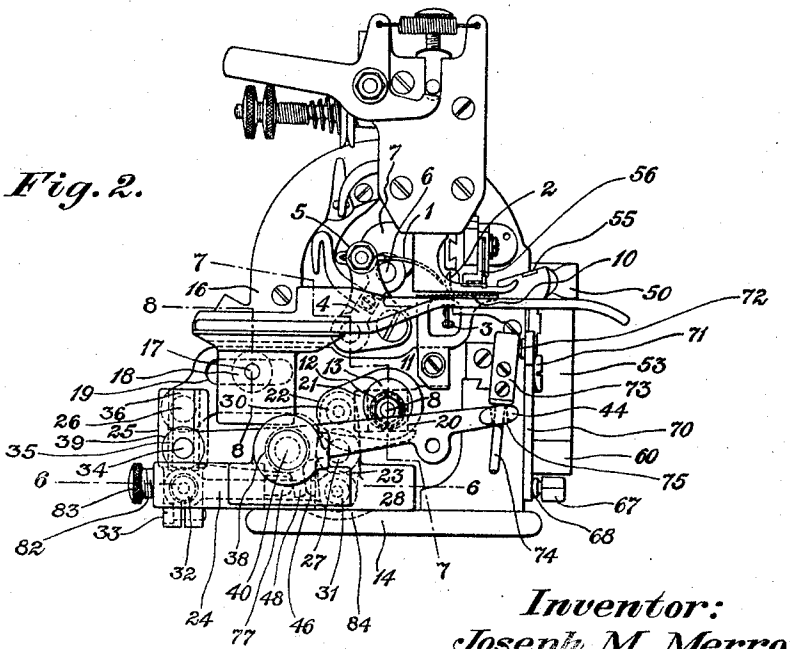


Fig. 2.



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Fig. 5.

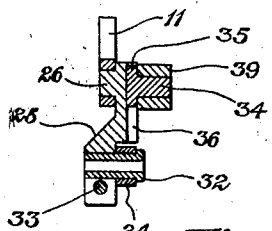


Fig. 4.

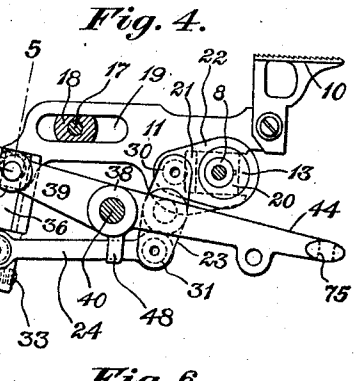


Fig. 3.

Fig. 6.

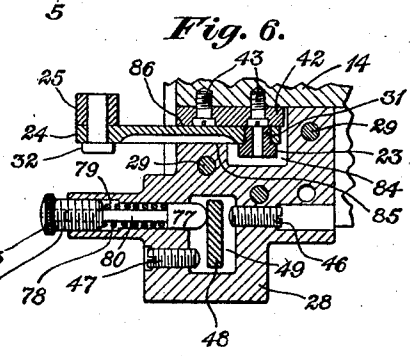


Fig. 7.

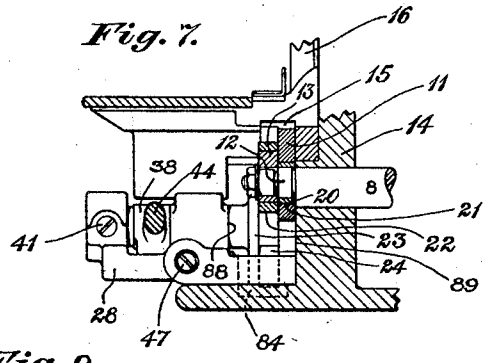


Fig. 8.

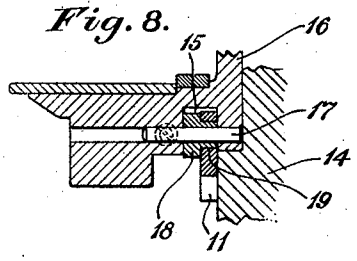
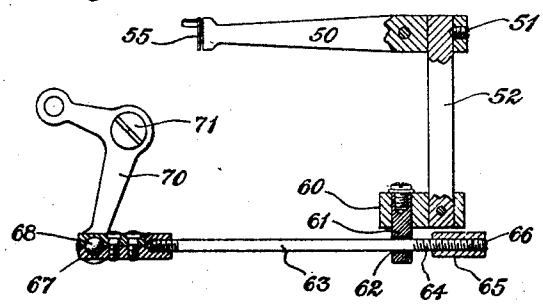


Fig. 9.



Inventor:
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UNITED STATES PATENT OFFICE.

JOSEPH M. MERROW, OF HARTFORD, CONNECTICUT, ASSIGNOR TO THE MERROW MACHINE COMPANY, OF HARTFORD, CONNECTICUT, A CORPORATION OF CONNECTICUT.

SEWING MACHINE.

Application filed December 17, 1923. Serial No. 681,254.

To all whom it may concern:

Be it known that I, JOSEPH M. MERROW, a citizen of the United States, residing in Hartford, county of Hartford, State of Connecticut, have invented certain new and useful Improvements in Sewing Machines; and I do declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the characters of reference marked thereon.

This invention relates to sewing machines and particularly to sewing machines adapted for use in the manufacture of hosiery and similar goods. In machines of this type provision is commonly made of devices whereby the trimming of fabric comprising the work may be effected simultaneously with the application thereto of stitches formed by the stitching elements. Also an edge guide is commonly provided which may be employed to definitely direct the fabric as it is advanced to the stitching elements by suitable feed mechanism. In producing the results for which the present invention is primarily intended, the trimming devices and edge guide are alternatively employed. Each means is instrumental in determining the width of margin enclosed by the stitching, or that characteristic which may be more conveniently referred to as "depth" of stitch. The stitch depth ordinarily desired to be established by the edge guide is less than the stitch depth suitably established by the trimming devices, therefore when the edge guide is in use the trimming devices are rendered ineffective without changing their effective position,—in other words regulation of the stitch depth to make it suitable for either the trimmed or untrimmed material is secured by simply moving the edge guide from a non-effective to an effective position and vice versa, and to permit such movement of the edge guide it is shiftably mounted. For certain work appearance and utility, of stitching varied in depth as already set forth, may be further enhanced by varying the spacing or length of the stitches. This spacing referred to is effected by feed mechanism and is controlled by adjustment of parts associated therewith whereby the stitches may be differently separated to give that quality which may vary in degree as expressed by the terms "coarse" and "fine".

The object of my invention is the provision in an overseaming machine of means interposed between feeding mechanism and means for acting upon an edge or superposed edges of material whereby stitches applied to said edge or edges may be produced in various combinations of different length and depth. For this purpose my invention consists in the simple and efficient means included in the one form of embodiment of the invention chosen for illustration in the accompanying drawings and fully set forth in the following detailed description. The novelty of the invention is defined in the appended claims.

In the drawings,—

Figure 1, is a front view of a sewing machine embodying mechanism comprising my invention.

Figure 2, is a view of the machine as seen from the left in Fig. 1.

Figure 3, is a plan view partly in section of mechanism including parts particularly related to my invention, portions only of certain parts being shown.

Figure 4, is a detailed view of feed mechanism and associated parts.

Figure 5, is a detail sectional view on line 5—5 of Fig. 4.

Figure 6, is a detail sectional view on line 6—6 of Fig. 2.

Figure 7, is a view of parts of the feed mechanism as seen from the right in Fig. 2, certain parts being in section substantially on line 7—7 of Fig. 2.

Figure 8, is a sectional view on line 8—8 of Fig. 2, and,—

Figure 9, is a detail view partly in section.

Referring to the drawings, characteristic features of an overseaming machine of the Merrow type (see U. S. Patent No. 733,760) which is particularly adapted to embody my invention, will be sufficiently identified through brief mention of certain of the parts as follows. The stitching instrumentalities comprise the curved eye pointed needle 1, upper looper 2, and lower looper 3. The needle receives its motion through the link 4, which connects the needle carrier 5, with an eccentric projection or stud 6, at the end of shaft 7. By mechanism (not

shown) associated with upper shaft 7, and lower shaft 8, the looper 2, is actuated to reciprocate and oscillate so that it passes in a curved path extending above and below the needle plate around one edge thereof, and looper 3, is reciprocated below the needle plate. The needle moves to cooperate with the lower looper below the needle plate, and with the upper looper above the needle plate, and the loopers, below the needle plate, move to cooperate with each other in a well known manner to form overedge stitching.

The tensions, take-ups and thread guides illustrated, serve their usual purpose in a manner that will be readily understood by those familiar with the sewing machine art,—this is also true of the presserfoot and presserfoot mechanism.

The feed mechanism with which my invention is directly involved will now be described. The feed dog 10, which is secured to the carrier 11, is actuated in the movements characteristic of a "four motion feed", by eccentrics 12 and 13, secured to the lower shaft 8, adjacent to one end of the machine frame 14. To permit the effect of the eccentrics to be transmitted through the carrier, the latter is mounted for sliding and pivotal motion in a guideway 15, in bracket 16, where it is supported on a pin 17, extending through a block 18, flattened to engage the elongated slot 19, near the rear end of the carrier. By virtue of this manner of supporting the carrier, it may, through parts to be described, be oscillated by eccentric 12, and reciprocated by the eccentric 13, to produce the required movement of the feed dog. The effect of eccentric 12, is transmitted through a rectangular block 20, embraced by a bearing opening 21, in the carrier. The effect of eccentric 13, is transmitted through link 22, rocker 23, link 24 and rocker 25, the latter being connected to carrier 11, as by a pivotal joint 26. The rocker 23, is pivoted on a stud 27, which is secured in a support 28, held to the base of the machine frame by screws, as 29. Studs 30 and 31, at opposite ends of rocker 23, respectively engage link 22 and link 24, and a hollow stud 32, connects link 24 with the rocker 25, said stud being held in a split socket at the end of the rocker by clamping screw 33.

While it will be obvious that the range of movement imparted by eccentric 13, to link 22, rocker 23, and link 24, is uniform, attention is now directed particularly to the means associated with the rocker 25, whereby its movement may be made to impart different degrees of movement to the feed carrier. The means employed include a movable fulcrum for rocker 25. Such a fulcrum may comprise a pivot 34, forming part of a slide block 35, which is fitted to a dovetail groove 36, in the rocker (see Figs. 4 and 5). This fulcrum is movable toward and from a point where its axis substantially coincides with the axis of the pivotal joint between the rocker 25 and feed dog carrier 11. When the axes mentioned nearly coincide the feeding movement imparted to the feed carrier is very slight and it follows that when the fulcrum axis is most remote from that of the pivotal joint between the rocker and carrier the maximum feeding movement will be imparted to the feed carrier. Moving the fulcrum to either extreme or any intermediate position may be effected by a lever 38, the arm 39, of which at its outer end supports pivot 34. Lever 38, is mounted on a stationary shaft 40, held at one end in support 28, as by a set screw 41, while at the other end it is additionally supported by a plate 42, secured to the machine frame by screws 43. It will be noted that the hub of lever 38, is sufficiently elongated to bring the arm 44, to a position where it may be operated by hand or connected through interposed parts in operative relation with an adjustable edge guide hereinafter described. For limiting movement of the feed changing lever, adjustable stop means are employed comprising the screws 46 and 47, engageable by a lug or wing 48, depending from the hub of the lever between walls of an opening 49, in support 28, into which latter the stop screws are threaded with their slotted ends conveniently accessible for engagement by a screw driver. Means including a spring are employed for moving the lever in a direction opposite to that in which it is intended to be moved by arm 44, or in the direction to engage lug 48 with stop screw 46, in which position the described parts transmit to the feed dog the maximum movement of the range permitted by the setting of the stop screws, from which it follows that pressure applied through lever 44 serves to decrease the length of stitch, the limit of the range in this respect being established either when the lug 48 engages stop screw 47, as when the lever 44 is actuated by hand independently of the edge guide devices to be described, or by stop means included in the edge guide mechanism as will more fully appear.

A device adapted for guiding material to be stitched and movable to positions respectively effective and noneffective for this purpose, may, as shown, include an arm 50, secured as by a set screw 51, to one end of a shaft 52, which is supported in a bearing 53, held on a suitable part of the machine frame as by screws 54. This arrangement permits arm 50, (see Fig. 3) to be swung from the position in which it is shown in full lines to the position indicated by dotted lines. In the former position the inwardly turned end of the arm extends over the

needle plate adjacent the presserfoot so that the shoe 55, or guide proper, is effective to direct material in a definite relation to the stitching elements, that is to say, the guide is in a position to determine the depth of stitch applied to material passing the guide in contact therewith. The depth of the stitch thus determined may be varied by adjustment of the edge guide with respect to the arm, provision for such adjustment being made by elongating the slot through which passes the screw securing the guide to the arm. As already stated, when the edge guide is not in position to direct material to the stitching elements, devices become effective for trimming the material simultaneously with the application of stitching thereto, the depth of the stitching during this relation of parts being determined by the position of the trimming cutters relative to the stitching elements. In the present case the trimming mechanism involved includes the movable and stationary cutters 56 and 57, respectively (see Fig. 3). Ordinarily the edge guide is used when the material to be stitched presents a folded edge or edges, where a lesser depth of stitch is required than where an edge or edges of trimmed fabric are to be secured, the depth of stitch, however, might advantageously be the same in each case and trimmers or edge guide employed according to the character of the edge to be stitched, that is to say, trimmed or untrimmed.

From the foregoing statements it will be clear that,—(1) the feed mechanism determines the length of stitch,—(2) the depth of stitch is determined either by the trimming cutters or the edge guide,—(3) the length of stitch may be varied by means associated with the feed mechanism and under control of lever 44,—it follows that if the length of stitch may be advantageously varied according to a difference in character of the edge or edges to be stitched or according to different depths of stitching as established respectively by the trimming cutters and edge guide, the desired change may be effected through suitable means whereby movement of the edge guide may be transmitted to actuate the feed changing lever 44. Such means, as illustrated, include an arm 60, secured to shaft 52, at that end of bearing 53, which is opposite to arm 50. In the free end of this arm is a pivotal stud 61, provided with an eye 62, to loosely receive a rod 63, the latter being threaded at 64, to receive a sleeve nut 65, which may be secured in desired adjustment by set screw 66, for a purpose that will presently appear. To the other end of rod 63, is secured a socket member 67, adapted to engage a ball stud 68, at one end of the angle lever 70, which is supported on a stud 71, and provided at its other end with a ball stud 72, to receive socket member 73, at the end of rod 74, which latter passes freely through an eye 75, in the feed changing lever 44, already described. The ball joints, it will be clearly understood, are introduced into the mechanism interposed between the movable guide support or arm 50, and the feed changing lever 44, to accommodate such non-alignment of the parts as is effected by their respective movement in transmitting adjustment desired, such non-alignment being also accommodated by a suitable amount of looseness or play of rod 63, in eye 62, and rod 74, in eye 75. As previously intimated the lever 44, is movable to the position in which it is shown in Figs. 1 and 2, or that limit of its range of movement established by a set screw 46, by spring actuated means. Such means include the plunger 77, and spring 78, placed in a bore 79, in support 28, with the plunger yieldingly engaging the lug 48, of lever 38. The stem 80, of plunger 77, is guided in a hollow screw 82, threaded into the outer end of bore 79, and provided with a knurled head 83, whereby it may be adjusted to vary the tension of the spring as may be required.

In Fig. 3, the movable support 50, is shown in full lines in a position where the edge guide is effective to direct material to the stitching elements, while the dotted lines indicate the position to which the support is moved to render the trimming device effective and through said movement to impart adjustment to the feed changing lever, said adjustment being opposed to the pressure of spring 78, by virtue of which, through intermediate parts, arm 60, in the dotted line position, is held against the machine frame which serves as a limiting stop on that side of a dead center line over which the crank pin or stud 61, has been moved. The amount of adjustment thus imparted to the feed changing lever, may be varied by adjusting sleeve nut 65, to leave more or less space between it and stud 61, to thereby vary the range through which movement of the edge guide support is effective to move said feed changing lever. While lever 44, engages rod 74, and is operable by a shoulder thereon when said rod is moved by parts associated with the edge guide support, it will be apparent that it is also operable independently of said rod and parts, such provision being made so that if desirable the feed may be changed without shifting the edge guide from its position adjacent to the stitching elements, in which event the screw 47, before referred to may be used as a limiting stop.

It will be noted that the support 28, and the machine frame are recessed at 84, to provide clearance for the end of rocker 23, where it is pivoted to link 24, the latter however, between its ends, makes contact

laterally with surfaces 85 and 86, respectively on support 28 and plate 42, so that the bearing thus provided tends to maintain the link in parallelism with associated parts which are similarly maintained by their respective lateral contact with each other and opposed surfaces 88 and 89, respectively of bearing 28 and the end of the machine frame, by virtue of which an influence is exerted whereby efficient action of the parts and their increased resistance to wear is assured.

In the manufacture of tubular web stockings a method of finishing is commonly employed which consists in fashioning the lower part of the leg of a stocking by cutting out a portion of the web, securing the cut edges with overedge stitching and continuing the stitching beyond the cut portion to form a "mock" seam in simulation of a real seam. For this work an overseaming machine provided with trimming mechanism and means for varying the stitching in the manner herein described is particularly well adapted.

Having thus described my invention, what I claim is,—

1. In a sewing machine, in combination, feed mechanism including a feed dog, a feed changing device associated with the feed mechanism and adjustable to vary the range of movement imparted to the feed dog, a device operable upon an edge or superposed edges of material and adjustable to vary its relation to the stitching elements, and means interposed between said device and the feed changing device whereby adjustment of one of them will impart an adjustment to the other.

2. In a sewing machine, in combination, feed mechanism including a feed dog, a feed changing device associated with the feed mechanism and adjustable to vary the range of movement imparted to the feed dog, a device operable upon an edge or superposed edges of material and adjustable to vary its relation to the stitching elements, means interposed between said device and the feed changing device whereby adjustment of one of them will impart an adjustment to the other, and means whereby the amount of adjustment thus imparted may be varied.

3. In a sewing machine, in combination, feed mechanism including a feed dog, a feed changing device associated with the feed mechanism and adjustable to vary the range of movement imparted to the feed dog, an edge guide movable to positions respectively effective and non-effective for directing material to the stitching elements, and means interposed between the edge guide and the feed changing device whereby movement of the edge guide will effect adjustment of the feed changing device.

4. In a sewing machine, in combination, feed mechanism including a feed dog, a feed changing device associated with the feed mechanism and adjustable to vary the range of movement imparted to the feed dog, separate devices for successively acting upon an edge or superposed edges of material, means for establishing successively the separate devices in operative relation, and means interposed between the last mentioned means and the feed changing device for transmitting adjustment from one to the other.

5. In a sewing machine, the combination with feed mechanism, a trimming device, and a guide for directing material to the stitching elements, of means for successively establishing the trimming device and the guide in operative relation, and means associated with the last mentioned means and the feed mechanism whereby the effect of the latter may be varied.

6. In a sewing machine, in combination, feed mechanism including a feed dog, a feed changing device associated with the feed mechanism and adjustable to vary the range of movement imparted to the feed dog, a movable support, an edge guide adjustably secured to the support, and means interposed between the feed changing device and the support whereby movement of one of them will effect adjustment of the other.

7. In a sewing machine, in combination, feed mechanism including a feed dog, a feed changing device associated with the feed mechanism and adjustable to vary the range of movement imparted to the feed dog, a device operable upon an edge or superposed edges of material and adjustable to vary its relation to the stitching elements, means including a spring for effecting certain adjustment of the feed changing device, and means associated with the device for operating upon an edge or superposed edges of the material for effecting other adjustment of the feed changing device.

8. In a sewing machine, in combination, feed mechanism including a feed dog, a feed changing device associated with the feed mechanism and adjustable to vary the range of movement imparted to the feed dog, a device operable upon an edge or superposed edges of material and adjustable to vary its relation to the stitching elements, spring actuated means for effecting adjustment of the feed changing device, means for varying the adjustment effected by the spring actuated means, means associated with the device for operating upon an edge or superposed edges of the material for also effecting adjustment of the feed changing device, and means for varying the adjustment thereby effected.

9. In a sewing machine, the combination with feed mechanism, a trimming device, and a guide for directing material to the

stitching elements, said trimming device and said guide being adapted to act successively on the material, of a movable support for the guide whereby the guide may be moved away from proximity to the stitching elements and the trimming device rendered effective, and a feed changing device associated with the feed mechanism and operable by movement of the support for the guide.

10. In a sewing machine, the combination with feed mechanism, a trimming device, and a guide for directing material to the stitching elements, said trimming device and said guide being adapted to act successively on the material, of a feed changing device associated with the feed mechanism and adjustable to vary the range of movement of the feed, a movable support for the guide whereby said guide may be moved away from proximity to the stitching elements and the trimming device rendered effective, means interposed between the movable support and the feed changing device for effecting adjustment of the latter, and means for defining limits of adjustment imparted to the feed changing device.

11. In an overseaming machine, the combination with feed mechanism, a trimming device, and a guide for directing material to the stitching elements, of means for successively establishing the trimming device and the guide in operative relation, and means associated with the last mentioned means and the feed mechanism whereby the effect of the latter may be varied.

JOSEPH M. MERROW.