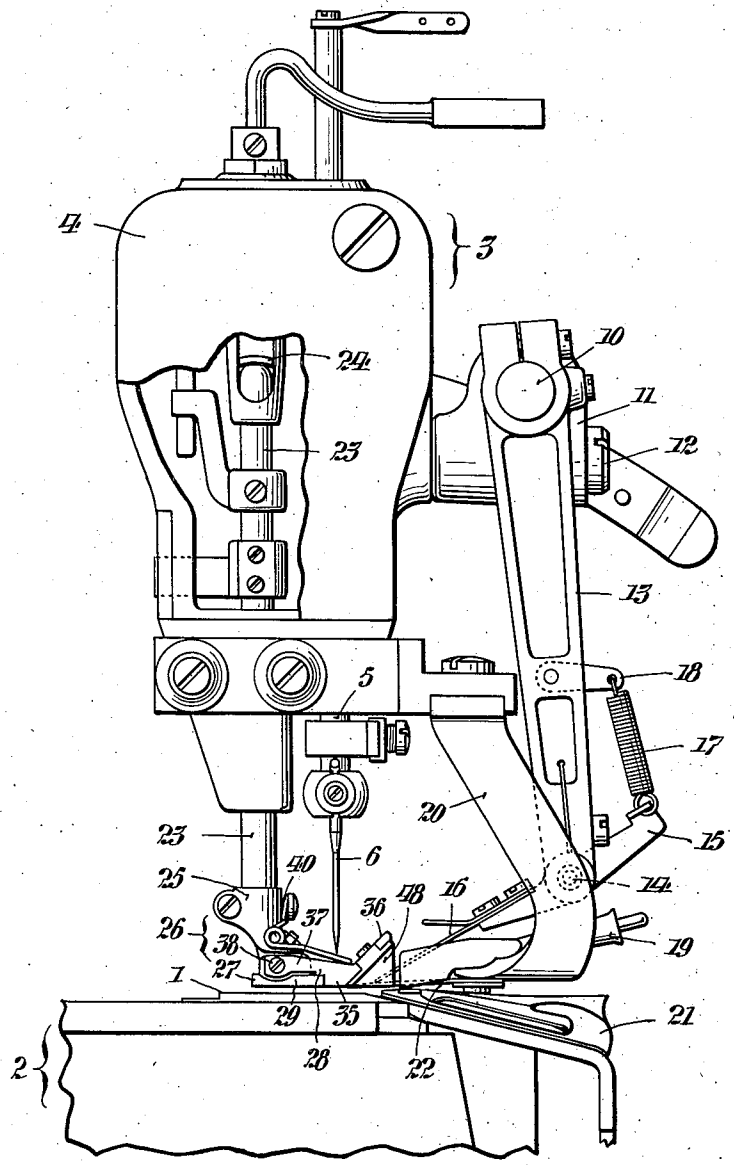
July 6, 1937. G. C. COOPER 2,086,013

SEWING MACHINE

Filed Feb. 26, 1935 3 Sheets-Sheet 1

FIG. I.



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SEWING MACHINE

Filed Feb. 26, 1935 3 Sheets-Sheet 2

FIG. II

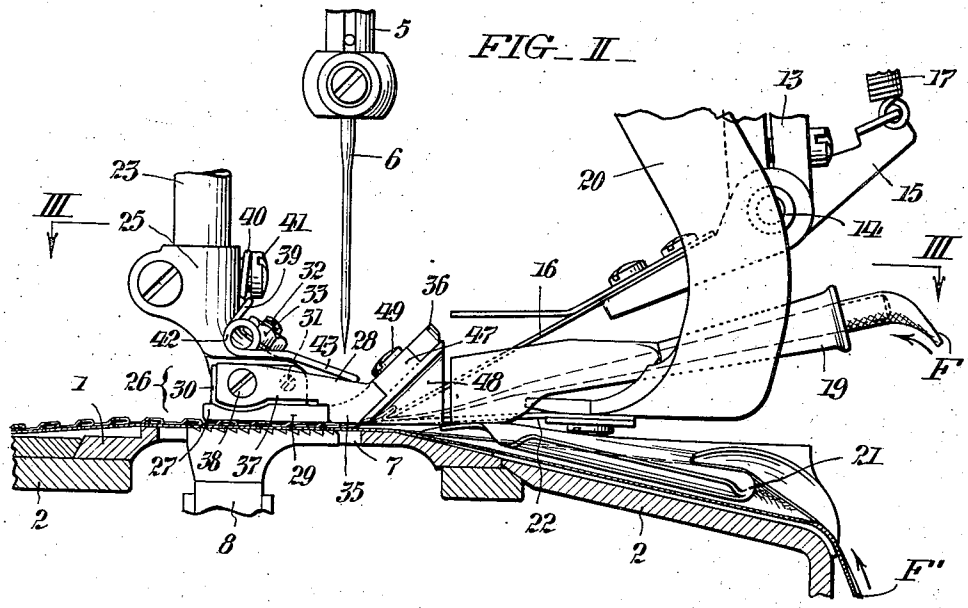


FIG. IV

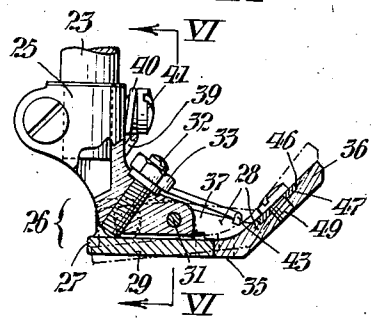


FIG. V

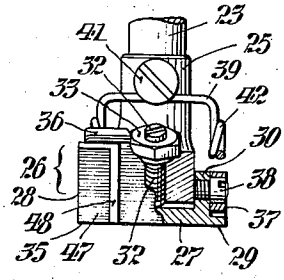


FIG. VI

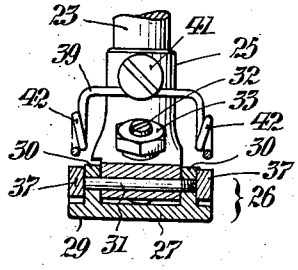
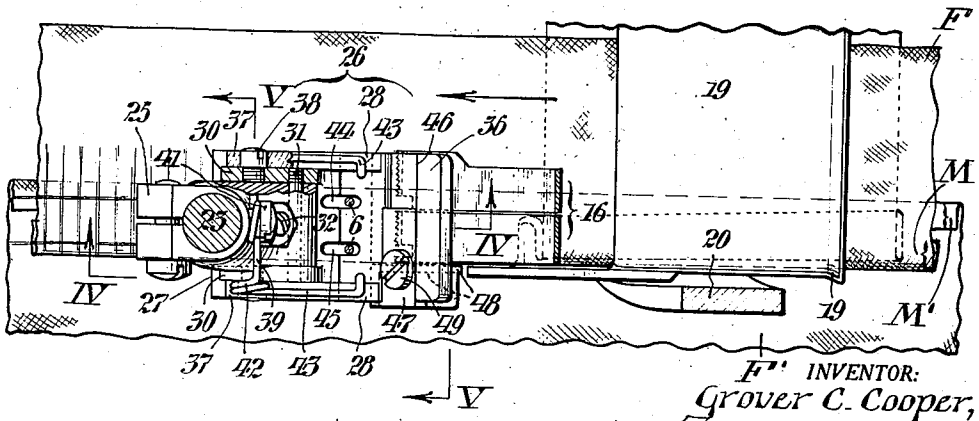


FIG. III



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July 6, 1937. G. C. COOPER 2,086,013

SEWING MACHINE

Filed Feb. 26, 1935 3 Sheets-Sheet 3

FIG. VII

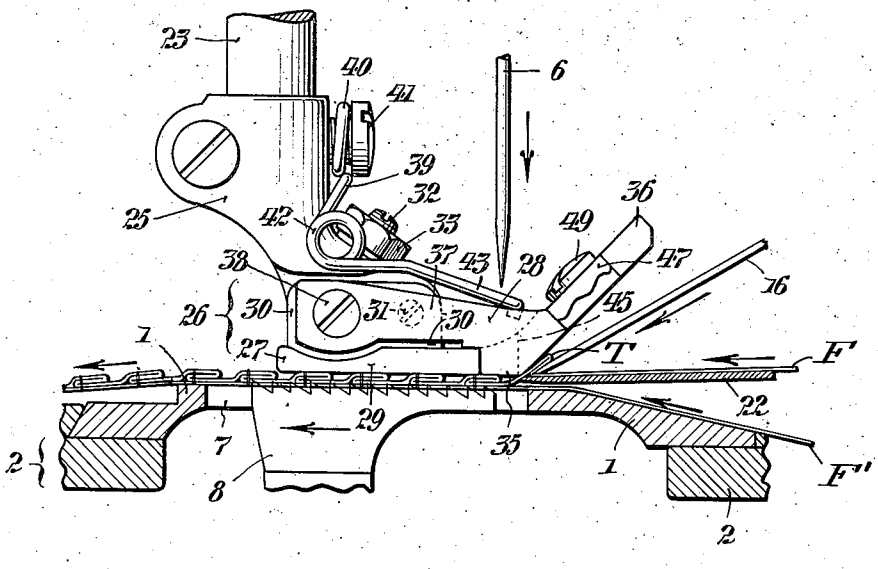
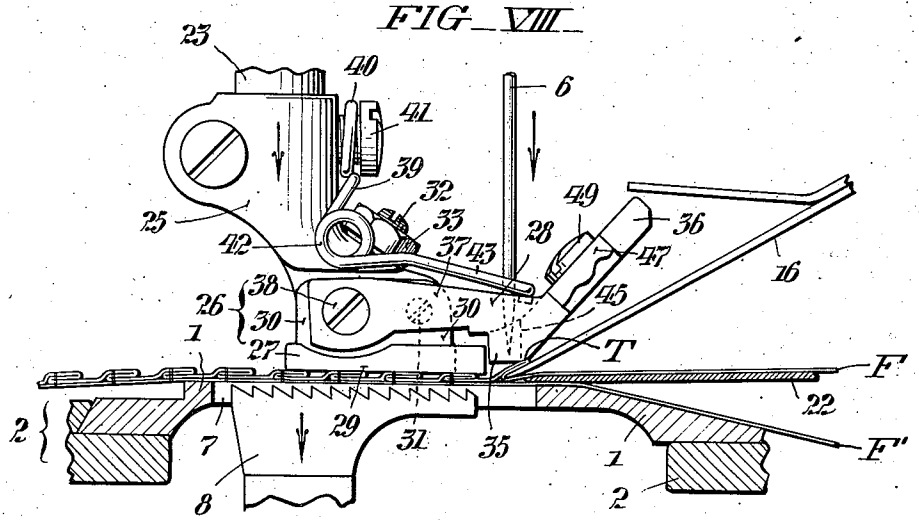


FIG. VIII



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UNITED STATES PATENT OFFICE

2,086,013

SEWING MACHINE

Grover C. Cooper, Hinsdale, Ill., assignor to Union Special Machine Company, Chicago, Ill., a corporation of Illinois

Application February 26, 1935, Serial No. 8,240

10 Claims. (Cl. 112—132)

This invention relates to sewing machines; and it has more particular reference to sewing machines with ruffling mechanism whereby tucks are formed in one strip of fabric concurrently with sewing thereof to another fabric strip.

In conventional forms of ruffling sewing machines, the presser feet are made solid, i. e., in one piece, and provided on their bottom faces at the front with clearances which extend to a point well beyond the needle or needles of the machine in the direction of fabric feed, to receive the advance edge of the ruffling blades. With this construction, it is impossible to form small or skimpy tucks in the ruffle fabric.

The chief aim of my invention is to overcome the above mentioned drawback. This objective I attain in practice, as hereinafter more fully set forth, through provision of a presser foot having a heel component pivotally connected with capacity for up and down movement, to the presser bar of the sewing machine and subject to comparatively heavy spring pressure; and a toe component pivoted to the heel component and subject to relatively light spring pressure with capacity to move independently up and down while cooperating with the ruffling blade of the sewing machine in forming the fabric tucks.

Other objects and attendant advantages will be manifest from the detailed description following of the attached drawings, wherein Fig. I is a fragmentary front elevation of a ruffling sewing machine conveniently embodying my invention, a portion of the head of the machine being broken out to expose important parts at the interior.

Fig. II is a fragmentary detail view drawn to a larger scale and showing a cross section of the machine along the line of fabric feed.

Fig. III is a fragmentary plan sectional view taken as indicated by the arrows III—III in Fig. II.

Figs. IV and V are detail sectional views taken as indicated respectively by the arrows IV—IV and V—V in Fig. III.

Fig. VI is a detail sectional view taken as indicated by the arrows VI—VI in Fig. IV; and

Figs. VII and VIII are views like Fig. II with the parts in different operative positions.

With more specific reference to these illustrations, 1 designates the throat plate of the sewing machine which is supported by the base or work table 2. Rising from the base 2 is the usual gooseneck 3, which terminates in a head 4. Vertically reciprocative in the head 4 is a needle bar 5, which in the present instance, carries two needles 6 at its lower end, said needles being aligned fore and aft of the machine. Operating in a transverse slot 7 of the throat plate 1 is a feed dog 8 to which the necessary movements are imparted by mechanism (not shown) within the hollow of the base 2 to intermittently advance the work in the direction of the arrows in Fig. VII. The ruffling mechanism of the machine includes a longitudinally-extending rock shaft 10 with journal support in bearings 11 secured by screws 12 to the side of the gooseneck 3. By suitable means within the hollow of the machine frame, the shaft 10 is rocked to impart vibratory motion to a pendant arm 13 at the forward end thereof, whereto is pivotally connected at the bottom end at 14 a holder 15 with an attached ruffling blade 16. This ruffling blade 16 is yieldingly urged downward by a helical spring 17 connected at one end to an adjustable lug 18 on the pendant arm 13 and at the other end to the holder 15. The machine is furthermore provided with an upper fabric folder 19 which is supported by a fixed bracket arm 20 secured to the head 4; and a lower fabric folder 21 which is secured to the base 2 of the machine, said folders 19 and 21 being respectively convergent toward the needles 6. Also secured to the bracket 20 is a divider plate 22 which serves to maintain the upper and lower fabric strips F and F' (Figs. VII and VIII) directed through the folders 19 and 21 separated until they reach the needles 6. The parts thus far described are of conventional design and construction and are pertinent to my invention only insofar as they cooperate with the novel presser foot which is about to be described.

Slidably guided in the head 4 is a vertical presser bar 23 which is subject to a relatively heavy leaf spring 24 within the hollow of said head. At its lower end the presser bar 23 is fitted with a shank member 25 carrying the presser foot 26, which comprises a heel component 27 and a toe component 28. As shown, the heel component 27 has a flat horizontal bottom portion 29, and a pair of transversely spaced upstanding horizontal flanges 30 which lap the sides of the shank member 25, and which, at their forward ends, are pivotally connected to said shank member by a fulcrum pin 31. An adjusting screw 32 threadedly engaged in an inclined tapped hole in the shank member 25, serves to limit the amount of free pivotal movement allowed the heel component 27 of the presser foot about the fulcrum pin 31, said screw being fixable in adjusted positions by means of a jamb nut 33. The toe component 28 of the presser foot 26 has a flat bottom

portion 35 which normally constitutes a continuation of the flat bottom portion 29 of the heel component, and a forwardly and upwardly inclined frontal portion 36. The toe component 28 is furthermore provided with laterally-spaced horizontal arms 37, which are pivotally connected by means of screws 38 to the flanges 30 of the heel component 27 at the rear end of the latter. By virtue of this construction, the toe component 28 is given the capacity for pivotal movement independently of the heel component 27, the upward movement of said toe component being yieldingly resisted by a relatively light spring 39 which has a central loop 40 for passage of a securing screw 41 engaged in the shank member 25 of the presser bar 23, and lateral coils 42 which terminate in arms 43 that bear downwardly on said toe component. Normally, the rear edge of the portion 35 of the toe component 28 abuts against the front edge of the portion 29 of the heel component 27 with the bottom faces of the two flush. As shown in Fig. III, the heel and toe components 27 and 28 of the presser foot are formed along their abutting edges with longitudinally aligned notches 44 and 45 which jointly constitute apertures for passage of the sewing needles 6.

The upper face of the inclined forward end of the toe component 28 of the presser foot is formed with a transverse slot 46, see Figs. III and IV, to receive the tongue 47 of a fabric edge guide 48. The tongue 47 of the guide 48 is longitudinally slotted for passage of a clamp screw 49 which serves as a means to secure the guide in different positions of lateral adjustment on the presser foot component 28.

The operation of the machine is as follows: The fabric F' is directed through the lower folder 21 of the machine, and incident to passage therethrough has a marginal fold M' (Fig. III) formed therein. The fabric F is concurrently directed through the upper folder 19 and by the latter formed with a marginal fold M corresponding to the marginal fold M' of the lower fabric F', the two fabrics being for a time maintained in separation in the usual manner by the dividing plate 22. The fabric F' in Figs. VII and VIII passes perfectly flat beneath the presser foot 26 throughout the operation, while each time that the ruffling blade 16 moves forward, it catches the upper fabric F at a point somewhat outward of the toe portion 28 of the presser foot and by cooperation with the latter as in Fig. VII, forms a tuck T which it places beneath the portion 35 of said toe component, the latter yielding to upward movement under the action of the spring 39 with attendant smoothing of said fold. During a slight dwell of the ruffling blade 16 in its advanced position, the needles 6 descend and penetrate the newly formed fold T of the upper fabric F as well as the lower fabric F' with attendant joining of the two strips by the stitches formed with the needle threads as conventionally shown in Figs. VII and VIII. After penetration of a new fabric fold by the needles 6 the ruffling blade 16 recedes, thereby permitting the toe component 28 of the presser foot to descend under the action of its spring 39 to hold down the newly formed tuck while the work is advanced by subsequent action of the feed dog 8. Incident to this operation, the guide 48 on the toe component of the presser foot 26 operates to guide the folded edge of the upper fabric F as it is passed to the needles 6.

Having thus described my invention, I claim:

1. In a sewing machine, a fabric support; a needle; means for intermittently feeding fabric on the support past the needle; a reciprocating ruffling blade; and a presser foot with a pivotally-supported main component and an independently yielding supplemental component pivotally connected to said main component and adapted to cooperate with the ruffling blade in forming tucks in the fabric during quiescent periods of the feeding means, and to hold down the newly formed tucks after retraction of the ruffling blade and during progression of the fabric.

2. In a sewing machine, a fabric support; a needle; means for intermittently feeding fabric on the support past the needle; a reciprocating ruffling blade to form tucks in the fabric during quiescent periods of the feed means; a presser bar subject to a relatively heavy spring pressure; and a presser foot comprising a heel component pivoted to the presser bar with capacity for up and down movement, and a toe component pivoted to the heel component and subject to a relatively light spring for capacity to yield independently in receiving tucks successively formed and advanced therebeneath by the ruffling blade for penetration by the needles and to hold the newly formed tucks after retraction of the ruffling blade and during progression of the fabric.

3. A presser foot for sewing machines comprising a heel component pivotally connected to a supporting presser bar with capacity for vertical movement; a toe component pivotally connected to the heel component on an axis different from the pivot axis of said heel component for capacity to move independently up and down; and a spring to yieldingly resist upward movement of the heel component.

4. A presser foot for sewing machines comprising a heel component pivoted at its forward end to a shank on a supporting presser bar; a toe component with horizontal arms pivoted to the rear end of the heel component with capacity for independent up and down movement; and a spring to yieldingly resist upward movement of the toe component.

5. In a sewing machine, a fabric support; a needle; means for intermittently feeding fabric on the support past the needle; a reciprocating ruffling blade to form tucks in the fabric during the quiescent periods of the feeding means; a presser bar subject to relatively heavy spring pressure; and a presser foot with an upwardly inclined front end to cooperate with the ruffling blade in forming the fabric tucks, said presser foot having a heel component pivoted for up and down movement to the presser bar, and a toe component pivoted to the heel component and subject to a relatively light spring pressure with capacity to yield independently in receiving the tucks successively formed and advanced therebeneath by the ruffling blade for penetration by the needle, and to hold the newly formed tucks after retraction of the ruffling blade and during progression of the fabric.

6. In a sewing machine a fabric support; a needle; means for intermittently feeding fabric on the support past the needle; a reciprocating ruffling blade to form tucks in the fabric during the quiescent periods of the feeding means; a presser bar subject to a relatively heavy spring pressure; and a presser foot with a heel component pivoted for up and down movement to the presser bar, and with a toe component pivoted to the heel component and subject to a relatively light spring for capacity to yield inde-

pendently in receiving the tucks successively formed and advanced therebeneath by the ruffling blade for penetration by the needle, and to hold the newly formed tucks after retraction of the ruffling blade and during progression of the fabric, said toe component having an upwardly inclined front end to cooperate with the ruffling blade in forming the fabric tucks, and a guard at one side to guide the edge of the fabric.

7. In a sewing machine, a fabric support; a needle; means for intermittently feeding fabric on the support past the needle; a reciprocating ruffling blade to form tucks in the fabric during the quiescent periods of the feeding means; a presser bar subject to a relatively heavy spring pressure; and a presser foot with a heel component pivoted for up and down movement to the presser bar, and with a toe component pivoted to the heel component and subject to a relatively light spring for capacity to yield independently in receiving tucks successively formed and advanced therebeneath by the ruffling blade for penetration by the needle, and to hold the newly formed tucks after retraction of the ruffling blade and during progression of the fabric, said toe component having an upwardly inclined front end to cooperate with the ruffling blade in forming the fabric tucks, and a laterally adjustable guard to guide the edge of the fabric.

8. In a sewing machine, a fabric support; a needle; means for intermittently feeding fabric on the support past the needle; a reciprocating ruffling blade to form tucks in the fabric during the quiescent periods of the feeding means; a presser bar subject to a relatively heavy spring pressure; and a presser foot comprising a heel component pivoted for up and down movement to the presser bar, and with a toe component pivoted to the heel component and subject to a relatively light spring for capacity to yield independently in receiving the tucks successively formed and advanced therebeneath by the ruffling blade for penetration by the needle, and to hold the newly formed tucks after retraction of the ruffling blade and during progression of the fabric, and an adjustable set screw engaged in the presser bar for limiting the movement of the heel component about its pivotal connection with said bar.

9. A presser foot for sewing machines comprising a heel component pivotally connected to a supporting presser bar with capacity for vertical movement; and a toe component, with an upwardly inclined front end, pivotally connected to the heel component on an axis different from the pivot axis of said heel component for capacity to move independently up and down; and a spring to yieldingly resist upward movement of the heel component.

10. A presser foot for sewing machines comprising a heel component pivotally connected to a supporting presser bar with capacity for vertical movement; a toe component pivotally connected to the heel component on an axis different from the pivot axis of said heel component and having capacity to move independently up and down, said toe component being formed with an upwardly inclined front end and provided at one side with a fabric edge guide; and a spring to yieldingly resist upward movement of the heel component.

GROVER C. COOPER.