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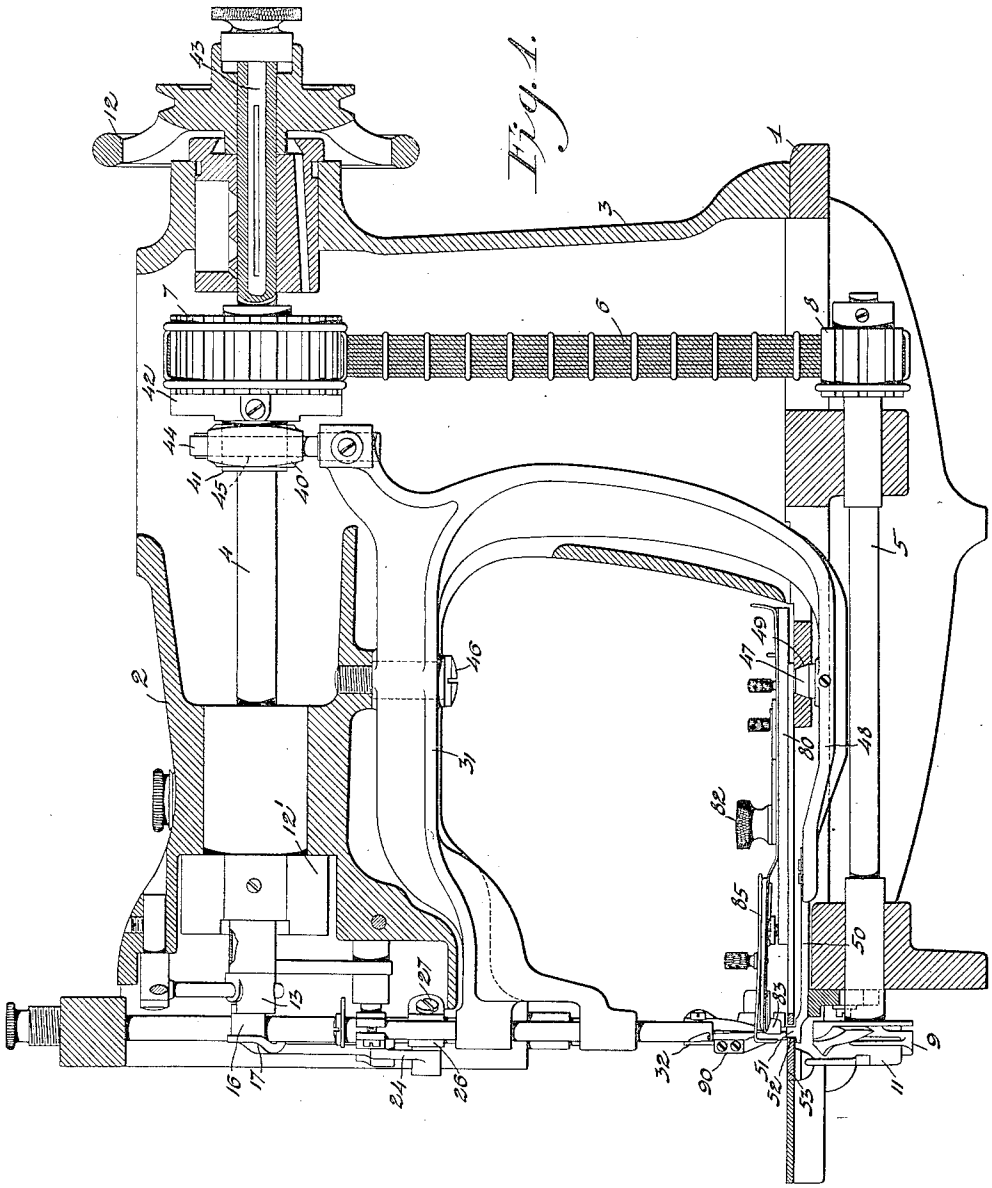
FEEDING MECHANISM FOR SEWING MACHINES.

APPLICATION FILED OCT. 8, 1914.

1,238,197. Patented Aug. 28, 1917.

4 SHEETS—SHEET 1.

Fig. 1.



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4 SHEETS—SHEET 2.

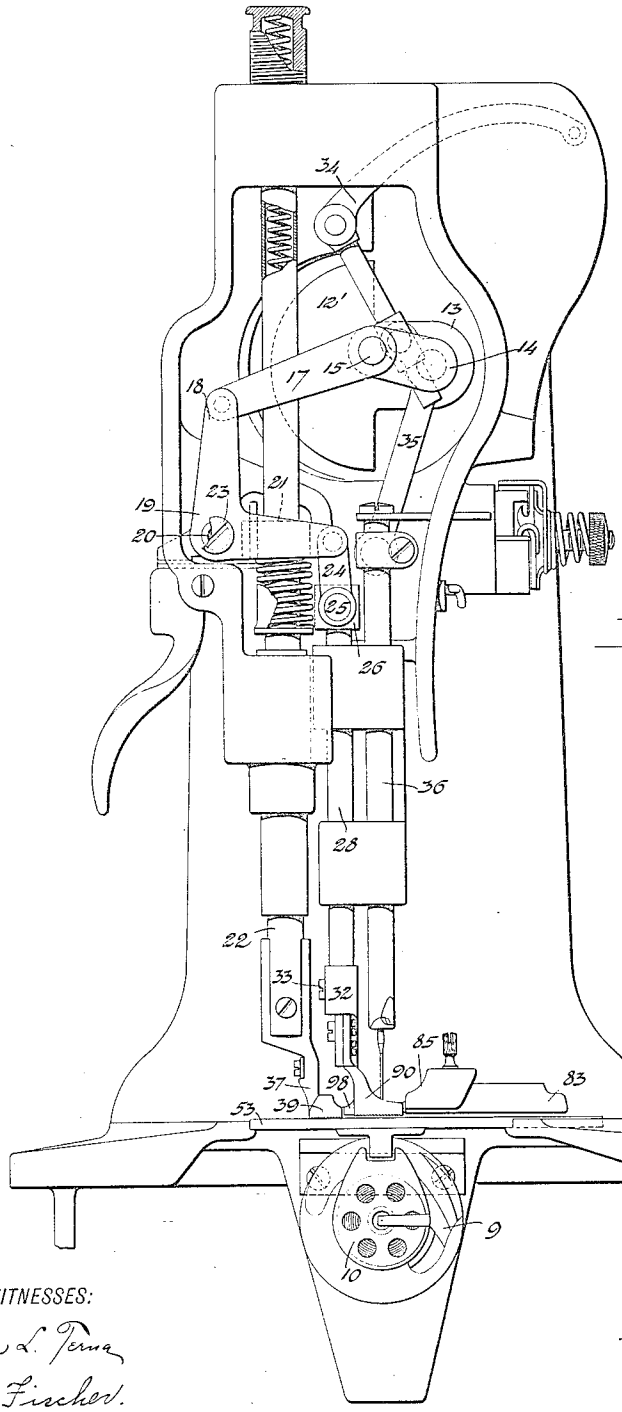


Fig. 2.

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Fig. 3.

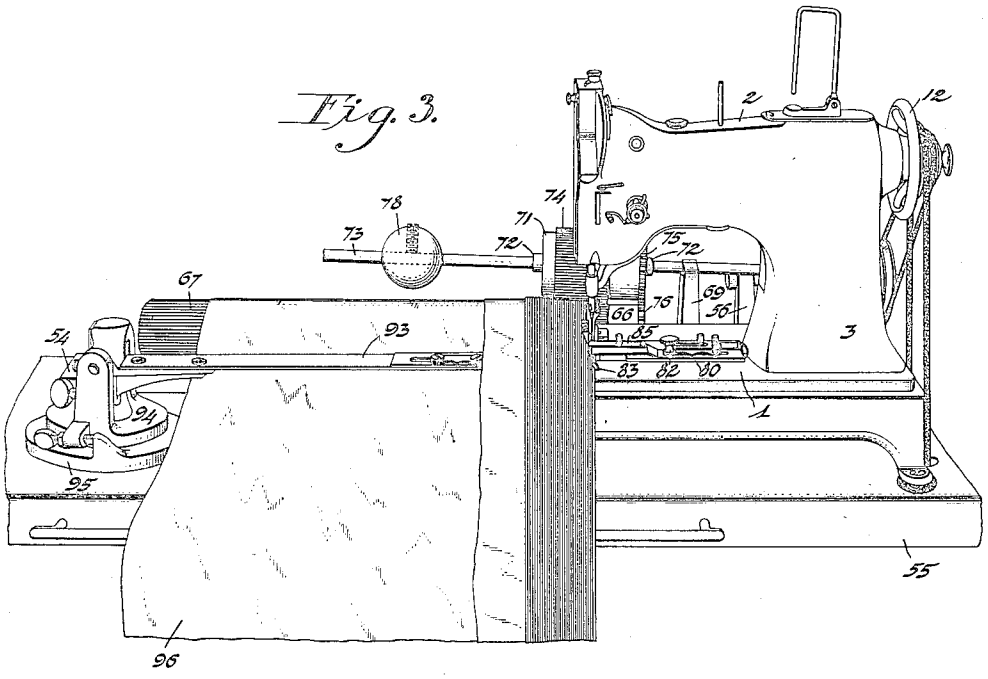
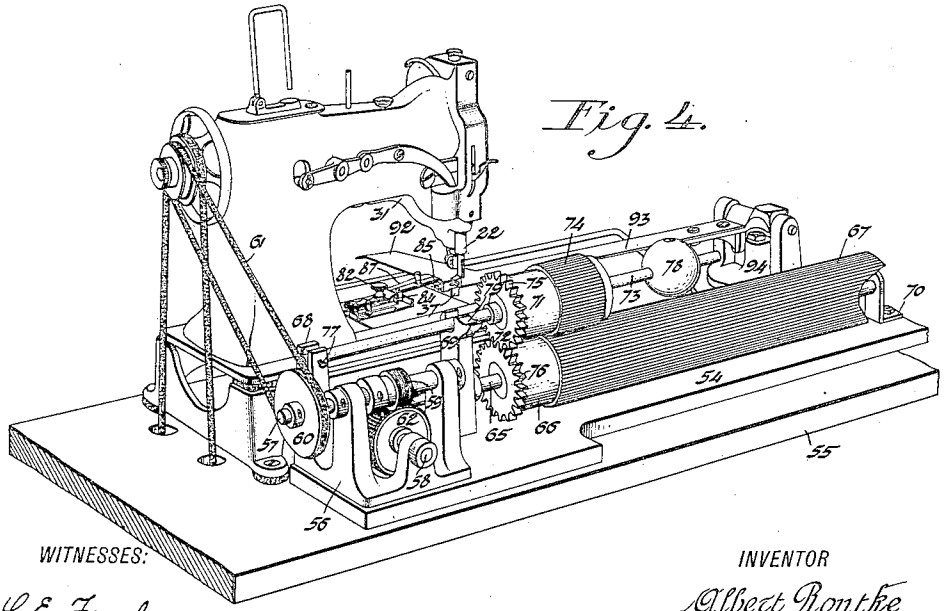


Fig. 4.



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4 SHEETS—SHEET 4.

Fig. 5.

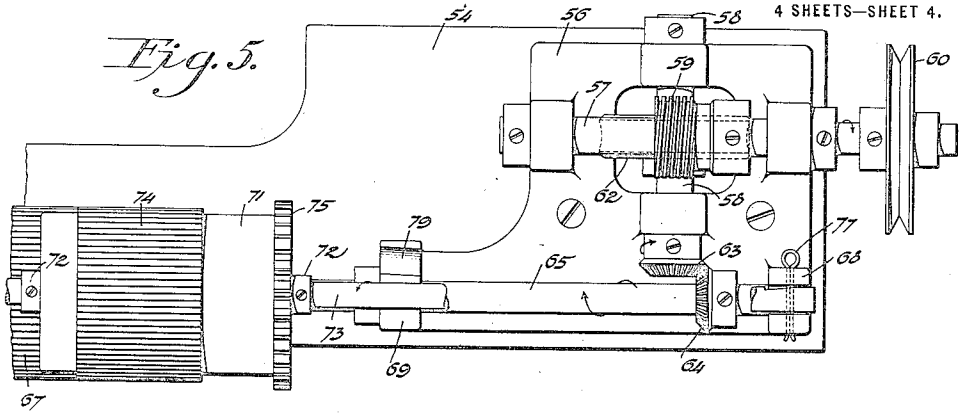


Fig. 6.

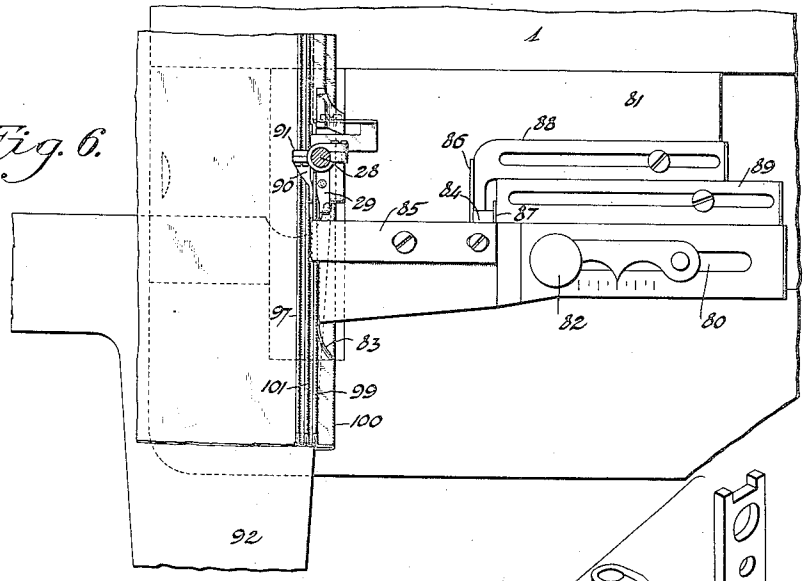


Fig. 7.

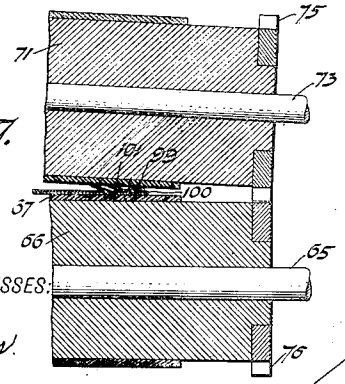
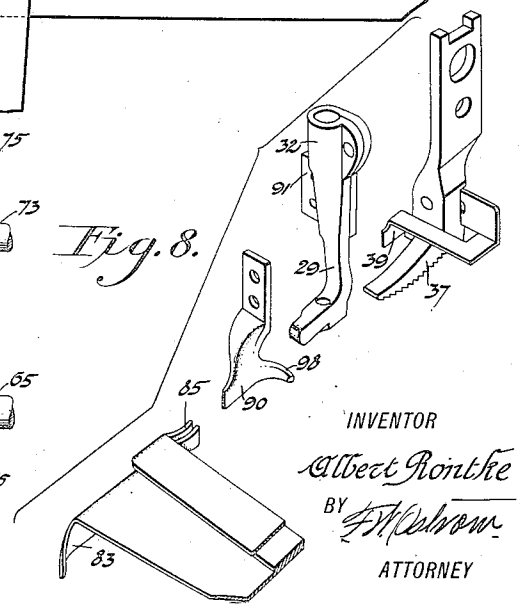


Fig. 8.



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UNITED STATES PATENT OFFICE.

ALBERT RONTKE, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO THE SINGER MANUFACTURING COMPANY, A CORPORATION OF NEW JERSEY.

FEEDING MECHANISM FOR SEWING-MACHINES.

1,238,197. Specification of Letters Patent. Patented Aug. 28, 1917.

Application filed October 8, 1914. Serial No. 865,650.

To all whom it may concern:

Be it known that I, ALBERT RONTKE, a citizen of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Feeding Mechanisms for Sewing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to improvements in sewing machines and has for its object to improve the means employed for presenting the fabric to the action of the stitch-forming mechanism, and to this end there is combined with one form of commonly employed step-by-step needle-feed, the same as is represented by United States Patent No. 989,538, April 11, 1911, an auxiliary feeding mechanism mounted independent of but preferably actuated by the actuating mechanism of the sewing machine.

In the folding and stitching of a multiple of closely arranged narrow parallel tucks it is essential to the sightliness of the product that the straight line design of the warp or the woof of the web be maintained, and especially is this true in connection with the tucking of striped fabrics, and while it has been practicable to effect substantially such result in connection with the folding and stitching of a comparatively small number of tucks (4 to 8) of limited length (10 to 12 inches), it is believed that the present construction is the first to accurately maintain the original design in connection with the stitching of a comparatively large number of parallel tucks (70 to 80) of substantial length (6 to 8 feet), and to effect this the auxiliary feeding mechanism coöperates with the needle-feed to effect a strain upon the fabric only at and in line with the seam; the needle-feed acting in opposition to the auxiliary feeding mechanism to cause the latter to effect feed movements of the fabric corresponding in amplitude to the feed movements of the needle-feed, the auxiliary feed comprising automatic means for directing the seam formation in a line parallel with the warp or woof, dependent upon the relative arrangement of the tucks with respect to the latter.

In the accompanying drawings, which form a part of the specification, Figure 1 is a front side elevation partially in section and partially in full lines, and Fig. 2 a front end elevation of the sewing machine represented by United States Patent No. 989,538, previously referred to; Fig. 3 is a front side elevation and Fig. 4 a rear side elevation in perspective of the sewing machine of Fig. 1, equipped with the present roller feeding mechanism; Fig. 5 a plan view of the roller feeding mechanism; Fig. 6 a plan view of the fabric guiding elements and a portion of the sewing machine bed-plate upon which said feeding elements are mounted; Fig. 7 a view of the rear end portion of the superposed feeding rollers, together with a cross-section of the fabric passing between the latter; and Fig. 8 perspective views of certain elements connected with the feeding and fabric-guiding mechanisms, later to be referred to.

Referring to the drawings, 1 represents the bed-plate of the sewing machine upon which is mounted the bracket-arm 2 and standard 3, 4 the main or needle-bar driving shaft connected with the lower or hook driving shaft 5 by an endless belt 6 adapted to engage pulleys 7 and 8 fast on said respective shafts, said pulleys being of the ratio of two to one, thus giving to the hook driving shaft two rotations to one rotation of the main-shaft, 9 the loop-taker carried by the shaft 5, 10 the bobbin, 11 the bobbin-case and 12 the hand or band-wheel secured upon the shaft 4.

The forward end of the shaft 4 is provided with a flange 12^1 in which is suitably secured one member 13 of a crank 14, the opposite member 15 of said crank being journaled in a bearing 16 formed in the presser-lifting lever link 17 which, in turn, is pivotally attached to the upper end 18 of the bell-crank presser-lifting lever 19. The lever 19 is fulcrumed upon a stud 20 forming a part of the presser-bar lifting collar 21, which latter is adjustably secured, by commonly employed means, upon the resiliently depressed cloth-presser bar 22, said lever being restrained against movement lengthwise of the stud 20 by screw 23. The opposite end of the lever 19 is pivotally connected with the step feeding foot-link 24, the lower end of which is pivotally mounted upon the stud 25 forming a part of the step feeding foot-collar 26 secured by pinch-screw 27 upon the step feeding foot carrying bar 28 mounted in suitable bearings formed in the oscillating feed-actuating

frame 31, the step feeding foot 29 forming an integral part of the collar 32 which is secured by a pinch-screw 33 to the bar 28.

34 represents the take-up common to the present machine operatively connected with the crank 14, as is the needle-bar connection 35 for giving to the needle-bar 36 its vertical movements, said needle-bar being mounted in suitable bearings formed in the upper free end of the oscillating frame, and to the lower end of the cloth-presser carrying bar 22 is suitably secured a serrated cloth-presser 37 provided with an adjustably secured tuck channel guide 39.

Referring to the means for giving to the frame 31 its oscillatory movements, 40 is a feed eccentric strap encircling the feed eccentric 41 which latter is adjustably secured to the disk 42 forming a part of the belt driving pulley 7, the mounting of the eccentric 41 and its adjustment by the rod 43 is substantially the same as that pointed out in United States Patent No. 718,988, May 27, 1903, to W. F. Dial *et al.*

44 represents the oscillating frame driving pin, the lower end of which is suitably secured in the frame 31, its opposite end passing through an opening 45 (shown in dotted lines only) formed in the eccentric strap 40. The frame 31 is mounted to oscillate upon oppositely arranged bearings comprising the fulcrum-stud 46 and pivot pin 47, the former being threaded into the bracket-arm and the pivot pin suitably secured in the lower arm 48 of said frame, the pin 47 entering an opening 49 formed in the bed-plate.

50 represents a frame extension suitably secured to the arm 48 and at its free end provided with a raised serrated portion 51 termed the "feed-dog," the latter being provided with a suitable needle opening in which the needle is housed during the feeding operation and tracking the slot 52 formed in the throat-plate 53.

As the oscillatory movements of the frame 31 are controlled by the eccentric 41, and as the needle and feed-dog are both employed for effecting the feed of the material, as pointed out in United States Patent No. 989,538 previously referred to, it follows that the oscillatory movements of the frame for effecting the feed movements of the needle and feed-dog occur during the time that the needle is in the material.

54 represents the roller feed base suitably secured upon the table-top 55, and upon said base is suitably secured a bearing frame 56 in which is journaled a gear driving shaft 57 and power transmitting shaft 58, the former shaft being provided with a spiral gear 59 and belt-pulley 60, the latter operatively connected with the band-wheel 12 by belt 61, the power-transmitting shaft carrying a spiral gear 62 and beveled gear 63 the gear 62 meshing with gear 59 and gear 63 with a like gear 64 secured on the feed-roller shaft 65 carrying the lower feed-roller 66 provided with a serrated covering 67, said feed-roller shaft being journaled in suitable bearings formed in the standards 68 and 69 and bracket 70.

71 denotes a second or upper feed-roller adjustably mounted by collars, as 72, to revolve on the feed-roller supporting bar 73 and provided with a serrated covering 74, the roller 71 being operatively connected with the shaft 65 by gear members 75 and 76 carried by the rollers 71 and 66, respectively. The supporting rod 73 is secured at one end to swing on the pivot pin 77, its opposite end being provided with an adjustably secured weight 78 for regulating the gripping action of the coacting feed-rollers. By reference to Figs. 3 and 4 it will be understood that the supporting rod 73, when in its normal or position shown in the latter figure, occupies a position parallel with the shaft 65, and when in effective relationship with the fabric, as shown in Fig. 3, is arranged at an angle to said shaft, as shown in Fig. 7. 79 denotes a seat for the supporting rod 73, when, for any purpose, it is desired to effect an opening between the feed-rollers, as when positioning the fabric to be acted on by the latter.

80 represents a tuck-guide base-plate permanently secured to the back slide-plate 81 of the sewing machine, and upon the said base-plate is adjustably secured by thumb-screw 82 the tuck-guide 83 provided with a depending lug 84 and carrying the adjustably secured space guide 85, said lug being normally located between the upturned flanges 86 and 87 of the adjustably secured brackets 88 and 89, respectively, thus making it convenient to maintain a given adjustment of said tuck-guide when, for any purpose, it is desired to remove it from and again return it to given adjustment. 90 denotes a tuck-deflecting guide suitably secured to a plate 91 carried by the step feeding foot 29 and 92 a tuck fold-guide common to the folding of plaits and tucks, said guide being carried by an arm 93 hinged on a turn-table 94 mounted on a base 95 secured to the table-top 55.

Having set forth the details of the present construction, the following mode of operation and coöperation of the several parts will be readily understood.

The operator first positions the endless strip of material 96 beneath the arm 93 and fold-guide 92, followed by folding the fabric over the free edge of the fold-guide with the folded portion between the feed-rollers 66 and 67, as shown in Figs. 3 and 7, except in position to form the first tuck 97 of the series, more plainly illustrated in Fig. 6 as to the employment of the several guiding

members, the fold-guide being the only guiding member essential to the formation of the first tuck, the operator being careful to direct the latter tuck slightly spiral to the length of the strip, and at substantially the completion of the first tuck the latter is directed between the tuck-guide 83 and space guide 85 and to the right of the guides 90 and 39, which is the relative arrangement of the several guides to the completing of the product, and in the continued operation of the machine, the horn or finger 98 of the deflecting guide 90 acts to lay the last completed tuck 99, see Fig. 7, over and upon the tuck 100 in course of formation, the channel guide 39 acting to direct the second last completed tuck 101 in a direction opposite to that of tuck 99, which causes the feeding rollers 66 and 71, through their inclined relationship, to effect their greatest feeding action on the material at a point directly in line with the seam formation, owing to the greater thickness of fabrics passing between the rollers in line with the needle.

In the relative timing of the coacting feeding mechanisms it is preferable to time the continuously actuated auxiliary feeding mechanism slightly faster than the step-by-step needle feed, *i. e.*, a relative timing of the auxiliary feeding mechanism which, if operated independent of the needle feed, would effect 19 stitches to the inch, and the timing of the needle feed of 20 stitches to the inch, thus effecting a slight slipping of the fabric between the rollers and a slight tension on the fabric between the rollers and needles, thus insuring that the seam will be fed away from the needle in parallelism with the previously formed seam, it being understood that the present arrangement of the feed-rollers will, of their own action, cause the point of greatest feed action to be brought into alinement with the point of greatest resistance, also that the present auxiliary feeding mechanism may be advantageously employed in connection with a sewing machine provided with any approved form of feeding mechanism or singly, dependent upon the character of the product desired.

While the present auxiliary feeding mechanism is operatively connected with the actuating mechanism of the sewing machine, it is evident it might be connected with a different source of power with substantially the same advantages.

Having thus set forth the nature of the invention, what I claim herein is:—

1. In a sewing machine for folding and stitching closely arranged parallel tucks, the combination with a stitch-forming mechanism including a vertically and laterally movable needle and a feeding mechanism, the latter including a step-feeding foot arranged above the fabric, of folding and guiding elements for forming the tucks and for guiding the latter to the action of the stitch-forming mechanism including a tuck deflecting guide carried by said feeding foot.

2. In a machine for folding and stitching closely arranged parallel tucks, the combination with a stitch-forming mechanism including a needle having stitch-forming movements and laterally arranged movements while in the fabric, and a feeding mechanism including a step-feeding foot arranged above the fabric, of folding and guiding elements for forming the tucks and for guiding the latter to the action of the stitch-forming mechanism including a tuck deflecting guide carried by said step-feeding foot.

3. In a sewing machine for folding and stitching closely arranged parallel tucks, the combination with a stitch-forming mechanism including a vertically and laterally movable needle, and a feeding mechanism including a cloth-presser and a step-feeding foot arranged above the fabric, of folding and guiding elements for forming the tucks and for guiding the latter to the action of the stitch-forming mechanism including a tuck deflecting guide carried by said feeding foot and a tuck-channel guide carried by said cloth-presser.

4. In a sewing machine for folding and stitching closely arranged parallel tucks, the combination with a stitch-forming mechanism including a vertically and laterally movable needle, and a feeding mechanism including feed-rollers located at the rear side of the sewing machine, a step-feeding foot and a cloth-presser arranged above the fabric and a feed-dog located below the latter, of folding and guiding elements for forming the tucks and for guiding the latter to the action of the stitch-forming mechanism including a tuck deflecting guide carried by said feeding foot and a tuck-channel guide carried by said cloth-presser.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

ALBERT RONTKE.

Witnesses:
EDWARD H. WOODS,
FRANK M. WOOTTON.