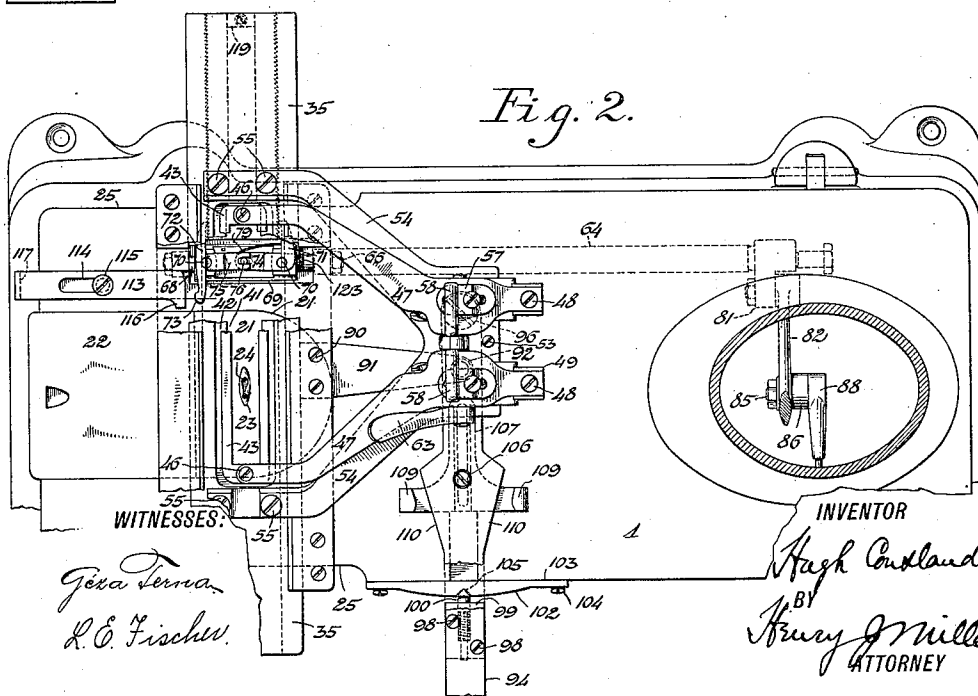
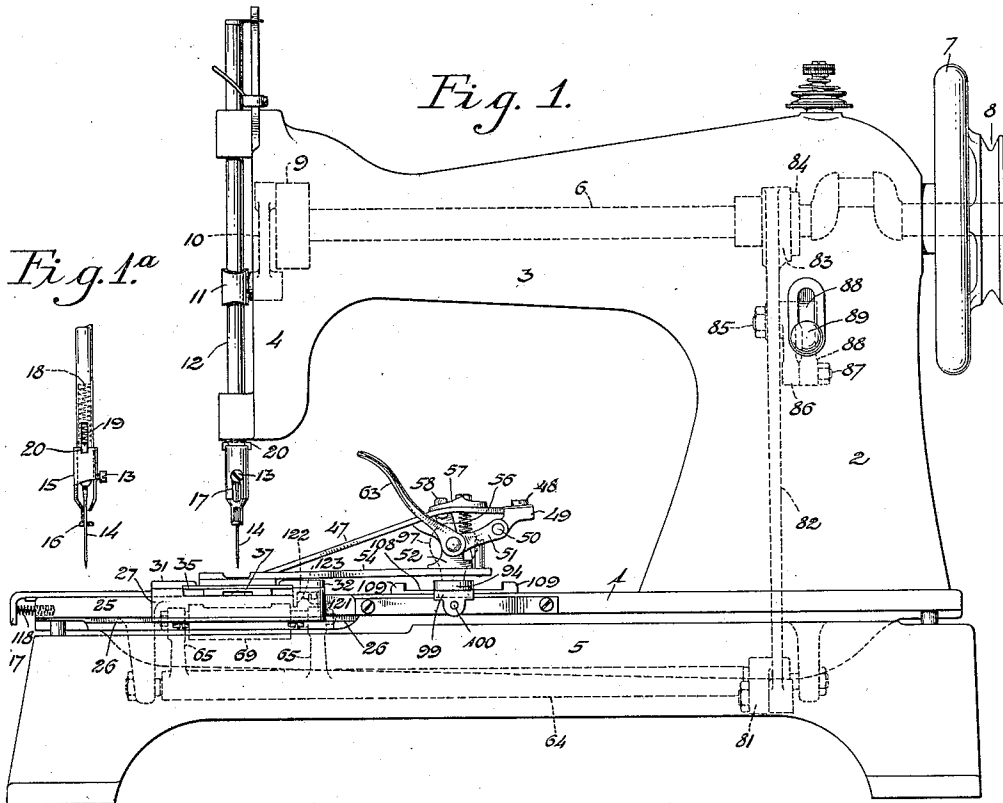


H. COUSLAND.
SEWING MACHINE.
APPLICATION FILED JAN. 17, 1913.

1,153,176.

Patented Sept. 7, 1915.
2 SHEETS—SHEET 1.

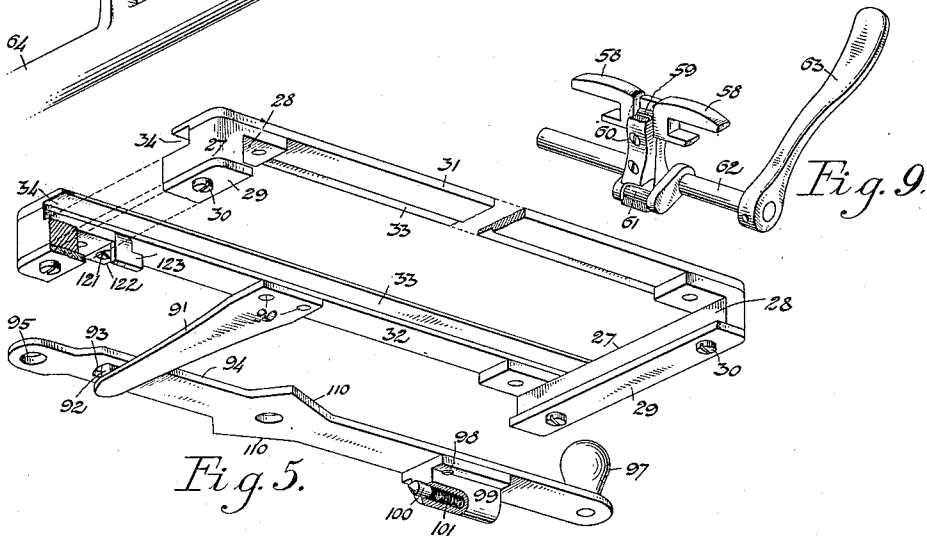
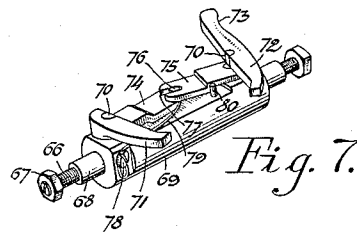
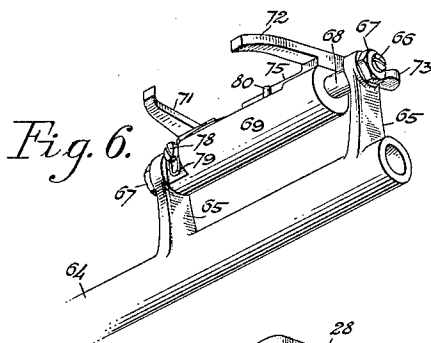
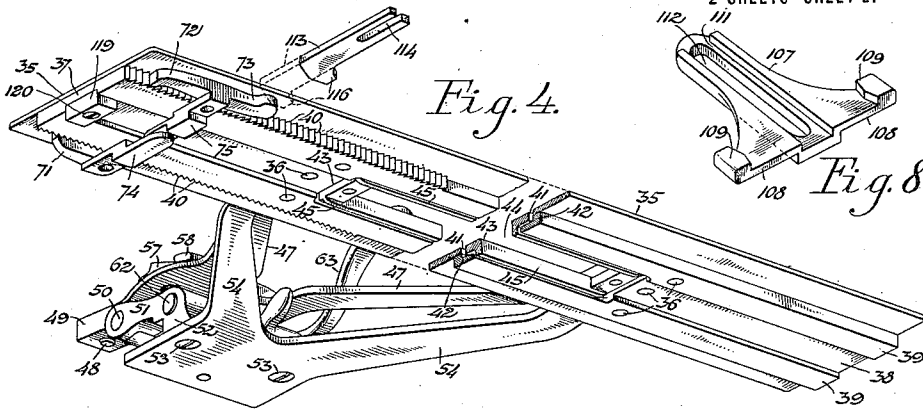


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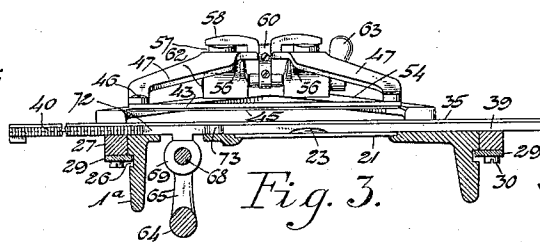
Patented Sept. 7, 1915.

2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

HUGH COUSLAND, OF SINGER, CLYDEBANK, SCOTLAND.

SEWING-MACHINE.

1,153,176.

Specification of Letters Patent.

Patented Sept. 7, 1915.

Application filed January 17, 1913. Serial No. 742,532.

To all whom it may concern:

Be it known that I, HUGH COUSLAND, a subject of the King of the United Kingdom of Great Britain and Ireland, and residing at Singer, Clydebank, Dumbartonshire, Scotland, have invented a certain new and useful Improvement in Sewing-Machines, of which the following is a specification.

This invention has for its object the provision of conveniently manipulated and effective means for presenting the work to the stitch-forming mechanism in stitching the backs of gloves and other articles requiring short lengths of seams, and particularly in the application to such articles of closely spaced parallel lines of stitching.

The present improvement is preferably embodied in that class of sewing machines comprising a reciprocating needle and a co-operating single-chain-stitch looper in conjunction with feeding mechanism comprising a feed-rocker or actuator in the form of a rock-shaft provided with a yoke having the work-advancing means and operatively connected with the main-shaft journaled in the bracket-arm.

As preferably constructed, the work-presenting means comprises a sidewise movable slide-frame formed with a guideway in which is fitted the lower member of a sliding work-clamp member sustaining a clamp-arm carrying the upper clamping member. Secured to the under side of the lower clamping members are rack-bars with oppositely presented ratchet-teeth engaged by connected spring-pressed pawls pivotally mounted upon a carrier slidingly and pivotally mounted upon a supporting pin sustained within the yoke of the feed-rocker, means being provided for retracting the normally operative pawls from the said rack-bars for the manual shifting of the work-clamp to initial position after a stitching operation or its removal from the carrier afforded by the slide-frame. The slide-frame is mounted in longitudinal guideways of the sewing machine bed-plate and connected with a shift-lever fulcrumed upon the bed-plate and formed with convergent contact shoulders which are embraced by the spaced arresting lugs of a stop member adjustable lengthwise of the lever upon the bed-plate for varying the

extreme throw of the shift-lever in opposite directions, detaining means being provided for yieldingly holding the shift-lever in intermediate position; thereby providing for the maintenance of the work-holder in each of two extreme positions and in intermediate position for application of three closely spaced parallel seams, while the work remains firmly clamped in the holder.

In the accompanying drawings, Figure 1 is a side elevation of a sewing machine embodying the present improvement, and Fig. 1^a an elevation, partly in section, of the lower portion of the needle-bar and the needle. Fig. 2 is a plan of the parts of the machine below the bracket-arm, with a portion broken out at one corner. Fig. 3 is a front end elevation of the work-holding device and the supporting bed-plate with the latter in transverse section. Fig. 4 is a perspective view of the work-holder taken from the lower side and Fig. 5 is a similar view of the slide-frame or work-holder support with its shifting means. Figs. 6 and 7 are perspective views of portions of the feed-actuating device. Fig. 8 is a perspective view of the stop member for the work-holder shift-lever. Fig. 9 is a perspective view of the clamp-closing means.

The sewing machine is shown formed with a frame comprising the bed-plate 1 from the rearward end of which rises the bracket-arm composed of the hollow standard 2 and the overhanging tubular arm 3 formed at its forward extremity with the head 4. The bed-plate is shown resting upon the hollow rectangular base 5. Within the bracket-arm is journaled the rotary main-shaft 6 carrying at its rearward end the balance-wheel 7 with belt-pulley 8, and at its forward end the crank-disk 9 having the usual pin connected by the pitman 10 with a stud projecting from the collar 11 secured to the needle-bar 12 whose lower end is tubular, as represented in Fig. 1^a.

Within the socket in the lower end of the needle-bar is secured by means of the clamp-screw 13 the needle 14 which in practice co-operates with a looper arranged beneath the bed-plate. Journaled upon the needle-bar is the tubular member 15 having a reduced lower portion carrying the stripper-foot 16, the body 15 being formed with a guide-slot

17 embracing the shank of the clamp-screw 13. The stripper foot is normally pressed downwardly by means of a spring 18 within the bore of the needle-bar which is formed with the transverse slot 19 through which passes the cross-pin 20 notched in its lower edge to embrace the upper end of the member 15 upon which it rests. The stripper-foot 16 operates in a manner wellknown to press the fabric downward upon the throat-plate as the needle begins to rise to present its loop to the looper, thereby insuring against skipping of stitches. The bed-plate is provided with the usual throat-plate 21 and slide-plate 22, the throat-plate being formed upon its upper side with the elongated and taper projection 23 containing the needle-hole 24.

In its forward portion the bed-plate is reduced in width and formed with parallel guiding edges 25 and the depending ribs 1^a with the external grooves 26, thereby producing with the upper face of the bed-plate rectangular guideways. The parallel bars 27 are formed in their adjacent edges with notches 28 fitted to the upper face and the opposite edges of the bed-plate guideway and are retained seated upon the bed-plate by means of the strips 29 which are secured to their under sides by means of the screws 30 with the edges overhanging and projecting within the grooves 26 of the bed-plate ribs 1^a. The end bars 27 are framed together by means of the parallel side-bars 31 and 32 which are formed in their adjacent edges with rebates 33 forming, with notches in the upper edges of the cross-bars 27, guideways 34 open at the rearward end to receive the work-holder.

The lower member of the work-holder comprises the slide-plate 35 to the lower face of which is secured by screws or rivets 36 a plate 37 formed in its lower face with the central longitudinal channel 38 to produce the spaced parallel bars 39 each of which has in the outer edge of its forward portion the series of ratchet teeth 40. Intermediate the ends, the plates 35 and 37 are cut out to form a central needle aperture 41 with the inwardly projecting lips 42 affording the parallel work-clamping jaws.

The upper clamping jaw consists of the rectangular plate 43 with central needle aperture 44 whose opposite outer marginal portions are opposed to the jaws 42, the plate 43 having along the inner edges the depending flange 45 extending slightly below the inner extremities of the jaws 42, so as to bend the material downwardly around the latter to hold it taut for the stitching operation. The upper jaw or "check" is secured by means of the screws 46 to the outer extremities of the spring arms 47 which are secured at the opposite ends by means of fastening screws 48 upon the tilting blocks 49. The blocks 49 are sustained by pivotal

pins 50 mounted upon the lateral lugs 51 of the bracket-piece 52 secured by screws 53 upon the yoked supporting plate 54 having its outer extremities fastened by screws 55 upon the top of the plate 35.

The clamp-arms 47 are normally pressed upwardly by means of springs 56 interposed between their lower faces and the bracket-piece 52. These clamps are provided near their rearward ends with wearing plates 57 and are embraced by the forked ends 58 of a pin 59 which is connected by means of the split link 60 with the crank-pin 61 of a rock-shaft 62 suitably journaled in bearings of the bracket-piece 52 and provided upon one end with the handle 63 by means of which the rock-shaft 62 is turned for opening and closing the work-clamp.

Beneath and longitudinally of the bed-plate is journaled the feed rock-shaft 64 provided at its forward end with the upwardly extending spaced arms 65 carrying the inwardly extending center screws 66 with lock-nut 67. Journaled upon the center screws 66 is the supporting pin 68 fitted to the bore of the axially apertured cylindrical carrier-block 69 which is adapted to slide freely endwise of the pin 68. Projecting from the opposite ends of the flattened upper face of the block 69 are the fulcrum-pins 70 of the pawls 71 and 72 formed at their extremities with teeth extending toward each other, the pawl 72 having a rearward extension or tail 73 projecting beyond its respective fulcrum. The pawls 71 and 72 are provided with inwardly projecting arms 74 and 75, the former being provided with a pin 76 embraced by a slot 77 in the overlapping extremity of the latter for coupling them together for reciprocal movement upon their respective fulcra. To the side of the carrier-block 69 is secured by means of the screw 78 a spring 79 whose free end engages the arm 74 and thus presses the operative extremities of the pawls toward each other. A stop-pin 80 is applied to the block 69 for engagement with the arm 75 of pawl 72 to limit the retractive movement of the pawls in opposition to the spring 79. The pawls 71 and 72 are spaced apart sufficiently to embrace the rack-plate 37, and their operative or toothed ends are normally maintained in operative relation with the ratchet teeth 40 upon the opposite edges of the rack-bars 39.

As represented principally in dotted lines in Figs. 1 and 2, the feed rock-shaft 64 carries the usual crank-arm 81 connected with the lower end of the link-bar 82 which has at its upper end the yoke 83 embracing the actuating eccentric 84 upon the main-shaft 6. The link-bar 82 is mounted upon the fulcrum-stud 85 carried by the swinging link 86 which is itself fulcrumed upon the stud-screw 87 sustained by the depending arm of

the feed-regulating angle-lever 88 mounted upon a fixed fulcrum and provided with the knob or button 89 by means of which it may be shifted to change the position of the fulcrum-pin 87 in varying the throw of the feed rock-shaft 64, in a manner common to Singer sewing machines.

Secured by means of screws 90 to the lower face of one of the side-bars 32 of the work-holder supporting frame is the laterally projecting arm 91 carrying the roller-stud 92 which enters a slot 93 in the shift-lever 94 formed at one end with the aperture 95 to receive a fulcrum-screw-stud 96 by means of which it is pivotally mounted upon the bed-plate 1 and at the opposite end with the knob or handle 97. To the lower face of the lever 94 is secured by means of screws 98 the block 99 provided with a socket parallel with the lever in which is journaled the shouldered and conical-pointed detent-plug 100 pressed normally outward by means of the spring 101 interposed between the head of said plug and the opposite end of the socket. The conical point of the plug is adapted to rest upon the segmental face 102 of the detent-plate 103 secured by screws 104 to the forward edge of the bed-plate 1, and to enter a notch 105 (Fig. 2) in said plate in the central position of the lever between extreme positions.

Secured upon the bed-plate by means of the screw 106 is the shank portion 107 of a stop-plate having at its forward end lateral extensions 108 provided with the spaced stop-lugs 109 which embrace an enlargement of the shift-lever 94 formed with the convergent contact edges 110 adapted for engagement with said stop-lugs in the extreme lateral positions of the lever. The shank 107 is formed in its upper face with a channel 111 to receive the head of the fastening screw 106 whose shank extends through the slot 112. By loosening the fastening screw, the stop-member 107 108 109 may be adjusted lengthwise of the shift-lever to vary the spacing of the lugs 109 from the contact edges 110 of the lever and thereby vary equally the range of movement of the latter upon opposite sides of the central position determined by the engagement of the detent-plug 100 with the notch 105 of the segment-plate 102 103.

Fitted within a suitable guideway in the top of the bed-plate 1 is a slide-bar 113 formed with the longitudinal slot 114 embracing the stud-screw 115 by means of which it is held slidingly within said guideway. This bar 113 is provided at its forward end with the lateral extension 116, whose forward extremity is adapted to engage the rounded end of the tail 73 of the pawl 72, while its opposite end is bent downwardly to form a lug or thumb-piece 117 between which and the end of a socket in the

forward end of the bed-plate is interposed a spring 118 for maintaining the bar 113 disengaged from the pawl-member 73.

By pressing the lug or thumb-piece in opposition to the spring 118 the bar 113 is thrown into engagement with the tail 73 of the pawl 72, and both pawls are retracted from operative engagement with their respective rack-teeth, so that the work-holder slide-plate 35 with its attached parts may be moved freely in either direction in the sidewise sliding support therefor comprising the slide-frame 27, 31, 32. A stop-block 119, secured within the end of the channel 38 of the plate 37 by means of the screw 120, is adapted to engage the rearward slide-frame member 27 to determine the initial position of the work-holder relatively to its sidewise-movable sustaining frame or support. To sustain the endwise thrust of the retracting bar 113 upon the feed-pawls, one of the side-bars 32 of the work-holder supporting frame has secured thereto by means of the screw 121, the foot 122 of a depending lug 123 which engages the end of the carrier-block 69 to prevent its endwise movement, and so retain the feed-pawls centrally in relation to the rack-bars 39 when the work-holder member 35 is moved endwise manually to shift it into initial stitching position or wholly remove it from the supporting frame.

In the use of a machine fitted with the attachment as thus described, the work-holder may be readily removed for adjustment, or other purposes, and in its introduction into the supporting frame the pawl-retracting bar 113 is merely moved forward to reciprocally move the pawls out of the path of movement of the rack-teeth to an initial position wherein the stop-block 119 is in contact with the rearward frame-bar 27, after which the release of the bar 113 permits the engagement of the feed-pawls with their respective series of rack-teeth under the action of the spring 79. The material having been inserted in the work-clamp by suitable operation of the finger-lever 63 of the controlling rock-shaft, the machine is set in motion, thereby imparting rocking movements to the feed-rocker or actuator 64 65 and consequently operative movements to the pawls 71 72 for imparting step-by-step feeding movements to the work-holder during the action of the stitch-forming mechanism. In the stitching of a series of parallel seams, it is preferable to shift the work-holder into one and then the other of its extreme lateral positions, and finally into intermediate position, and in this cycle of action the projection 23 of the throat-plate has a somewhat important function. In the production of chain-stitch-seams, and particularly with the use of coarse thread, a chain of loops is formed upon the lower face of the fabric which produces a quite prominent ridge

thereon. The projection 23 serves to support the work around the needle-path so as to maintain its substantially flat condition with clearance for the previously formed chain of loops between the lower face of the fabric and the throat-plate. In producing the final seam, the projection 23 serves as a guide between the chains of loops of the two outer seams so as to accurately position the third seam equi-distant from each of the other seams, thereby attaining the requisite symmetry of the product, which is otherwise preserved in the location of all the needle punctures in transverse lines by insuring a fixed starting position of the work-holder in its travel by engagement of the stop-lug 119 with the frame-member 27 prior to each stitching operation. It is to be understood that after each stitching operation, the feed-pawls are retracted and the work-holder manually shifted into initial position upon its sidewise-movable sustaining frame or support.

In ornamenting the backs of gloves, it is common to apply divergent series of parallel lines of stitching, and it is of course necessary to open the work-clamp at the completion of each series of parallel seams to shift the material into the proper position for application of the succeeding series slightly inclined thereto.

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

1. In a sewing machine, in combination, a traveling work-holder provided with a toothed rack, a constantly reciprocating feed-actuator, a pawl mounted upon said actuator and normally engaging the teeth of said rack, and pawl-retracting means normally spring-pressed out of engagement with the pawl.

2. In a sewing machine, in combination, a work-holder support formed with an open ended guide-way, a work-holder slidingly and removably mounted in the guide-way of said support, said work-holder being provided with two series of clutch elements and an elongated needle aperture intermediate the same, a reciprocating feed-actuator, a clutch device for connecting the same simultaneously with both series of clutch elements on the work-holder, and means for rendering said clutch device ineffective.

3. In a sewing machine, in combination, a traveling and sidewise-movable work-holder, a reciprocating feed-actuator, a clutch device comprising a member mounted upon said actuator to follow the sidewise movements of the work-holder, and means for shifting the work-holder sidewise relative to the movements imparted thereto by the clutch device.

4. In a sewing machine, in combination, a traveling and sidewise movable work-holder, a reciprocating feed-actuator, a clutch de-

vice comprising a member carried by said work-holder and a cooperating member adapted to follow the sidewise movements of the work-holder and operatively connected with the feed-actuator, and means for moving the work-holder sidewise.

5. In a sewing machine, in combination, a traveling and sidewise movable work-holder carrying a clutch element, a rocking feed-actuating element, a supporting pin mounted upon said actuating element parallel with its axis of movement, a clutch element slidingly mounted upon said pin and adapted for engagement with the clutch element of the work-holder, and means for shifting said work-holder sidewise.

6. In a sewing machine, in combination, a traveling and sidewise movable work-holder provided with a rack-bar, a rocking feed-actuating element, a supporting pin mounted upon said actuating element parallel with its axis of movement, a pawl-carrier slidingly mounted upon said pin, a pawl sustained by said carrier and adapted to engage the teeth of said rack-bar, and means for shifting said work-holder sidewise.

7. In a sewing machine, in combination, a traveling and sidewise movable work-holder provided with parallel and oppositely presented series of rack-teeth, a rocking feed-actuating element, a supporting pin mounted upon said actuating element parallel with its axis of movement, a pawl-carrier slidingly mounted upon said pin, spaced spring-pressed pawls sustained by said carrier each in engagement with the teeth of one of said series upon the work-holder, and means for shifting said work-holder sidewise.

8. In a sewing machine, in combination, a work-holder support formed with an open-ended guideway, a work-holder slidingly and removably mounted in the guideway of said support and provided with parallel and oppositely presented series of rack-teeth, a rocking feed-actuating element, a pawl-carrier mounted upon said actuating element, spaced spring-pressed pawls sustained by said carrier each in engagement with the teeth of one of said series upon the work-holder, and having an operative connection whereby they may be simultaneously retracted, and retracting means for said pawls.

9. In a sewing machine, in combination, a sidewise movable work-holder support formed with an open-ended guideway, a work-holder slidingly and removably mounted in the guideway of said support and provided with parallel and oppositely presented series of rack-teeth, a rocking feed-actuating element, a pawl-carrier mounted upon and movable parallel with the axis of movement of said actuating element, spaced spring-pressed pawls sustained by said carrier each in engagement with the teeth of one of said series upon the work-holder and

having an operative connection whereby they may be simultaneously retracted, means for shifting the work-holder support sidewise, and retracting means for said pawls.

5 10. In a sewing machine, in combination, a sidewise movable work-holder support formed with an open-ended guideway, a work-holder slidingly and removably mounted in the guideway of said support and provided with spaced parallel clutch elements, a reciprocating feed-actuating element, a carrier mounted upon and deriving operative movements from said feed-actuating element and movable relatively thereto in the direction of the sidewise movements of the work-holder support, clutch elements mounted upon said carrier and each normally engaging one of the parallel clutch elements upon said work-holder, means for shifting said work-holder support sidewise, and means for disengaging the second-named clutch elements from those upon the work-holder.

11. In a sewing machine, in combination, a sidewise movable work-holder support formed with a guideway, a work-holder slidingly mounted in the guideway of said support, means for imparting to the work-holder traveling movements within said guideway, a shift-lever operatively connected with said work-holder support for moving the same crosswise of the direction of travel of the work-holder, a fixed stop member provided with stop shoulders for arresting the movement of said shift-lever in both directions, and adjusting means whereby the limits of movement of said shift-lever in both directions may be simultaneously varied.

12. In a sewing machine, in combination, a sidewise movable work-holder support formed with a guideway, a work-holder slidingly mounted in the guideway of said support, means for imparting to the work-holder traveling movements within said guideway, a shift-lever operatively connected with said work-holder support for moving

the same crosswise of the direction of travel of the work-holder, a fixed stop member formed with spaced shoulders and adjustable lengthwise of said lever, and convergently arranged contact shoulders carried by said lever and disposed intermediate said stop shoulders.

13. In a sewing machine, in combination, a sidewise movable work-holder support formed with a guideway, a work-holder slidingly mounted in the guideway of said support, means for imparting to the work-holder traveling movements within said guideway, a shift-lever operatively connected with said work-holder support for moving the same crosswise of the direction of travel of the work-holder, a fixed stop member formed with spaced shoulders, contact shoulders carried by said lever and disposed intermediate said stop shoulders, and a detent device for holding said lever intermediate extreme positions and including a stationary notched segment and a spring-pressed pin carried by the lever and engaging a notch of said segment.

14. In a sewing machine, the combination with stitch-forming mechanism including a reciprocating needle, a traveling and sidewise movable work-holder formed with a needle-aperture of greater width than the length of its sidewise movement, means for imparting traveling movements to the work-holder, and means for shifting the work-holder sidewise, of a throat-plate arranged beneath the work-holder and provided upon its upper face with a projection of less width than the aperture of said work-holder and containing the needle aperture.

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

HUGH COUSLAND.

Witnesses:

JOHN MCCLEARY,
THOMAS BISHOP GRAHAM.