

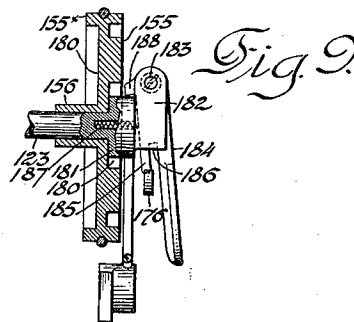
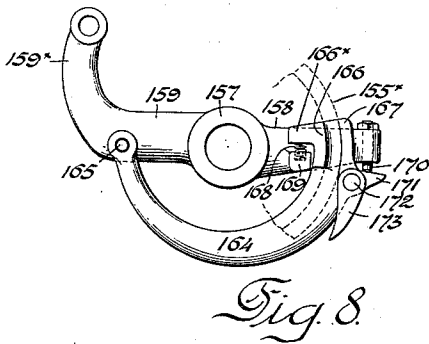
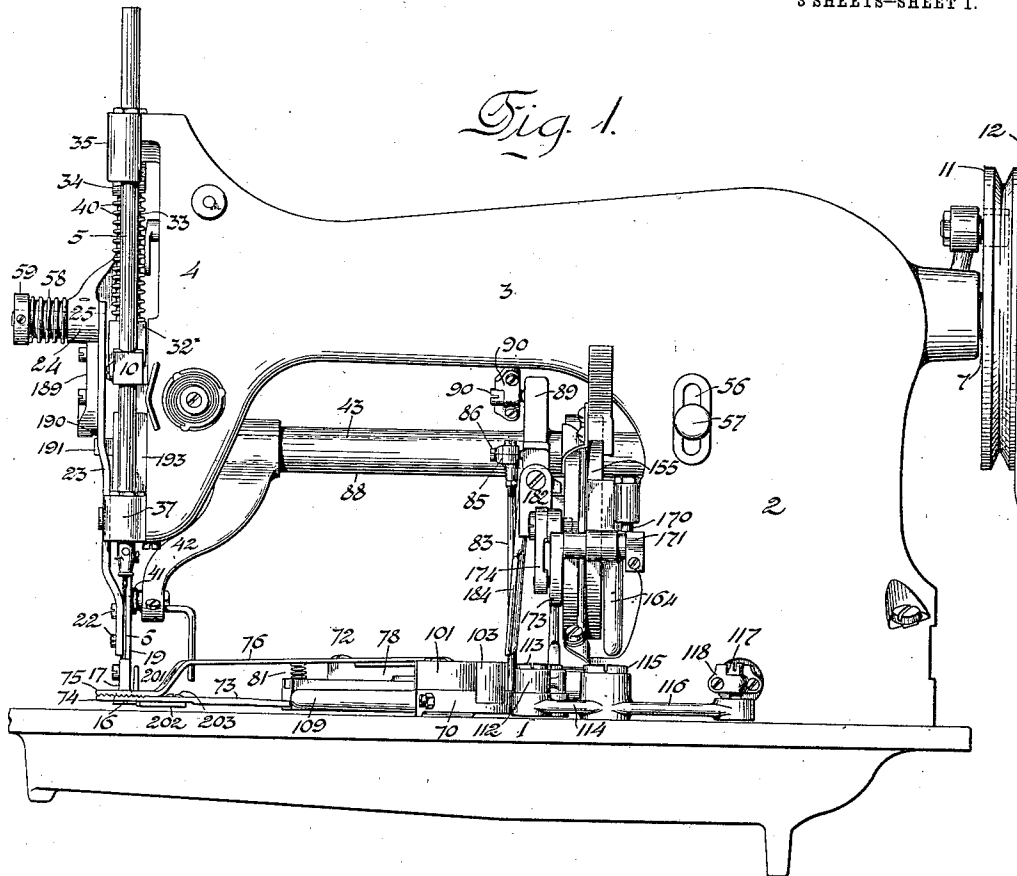
A. H. DE VOE.
SEWING MACHINE.

APPLICATION FILED OCT. 26, 1909.

Patented Nov. 21, 1911.

3 SHEETS-SHEET 1.

1,009,055.



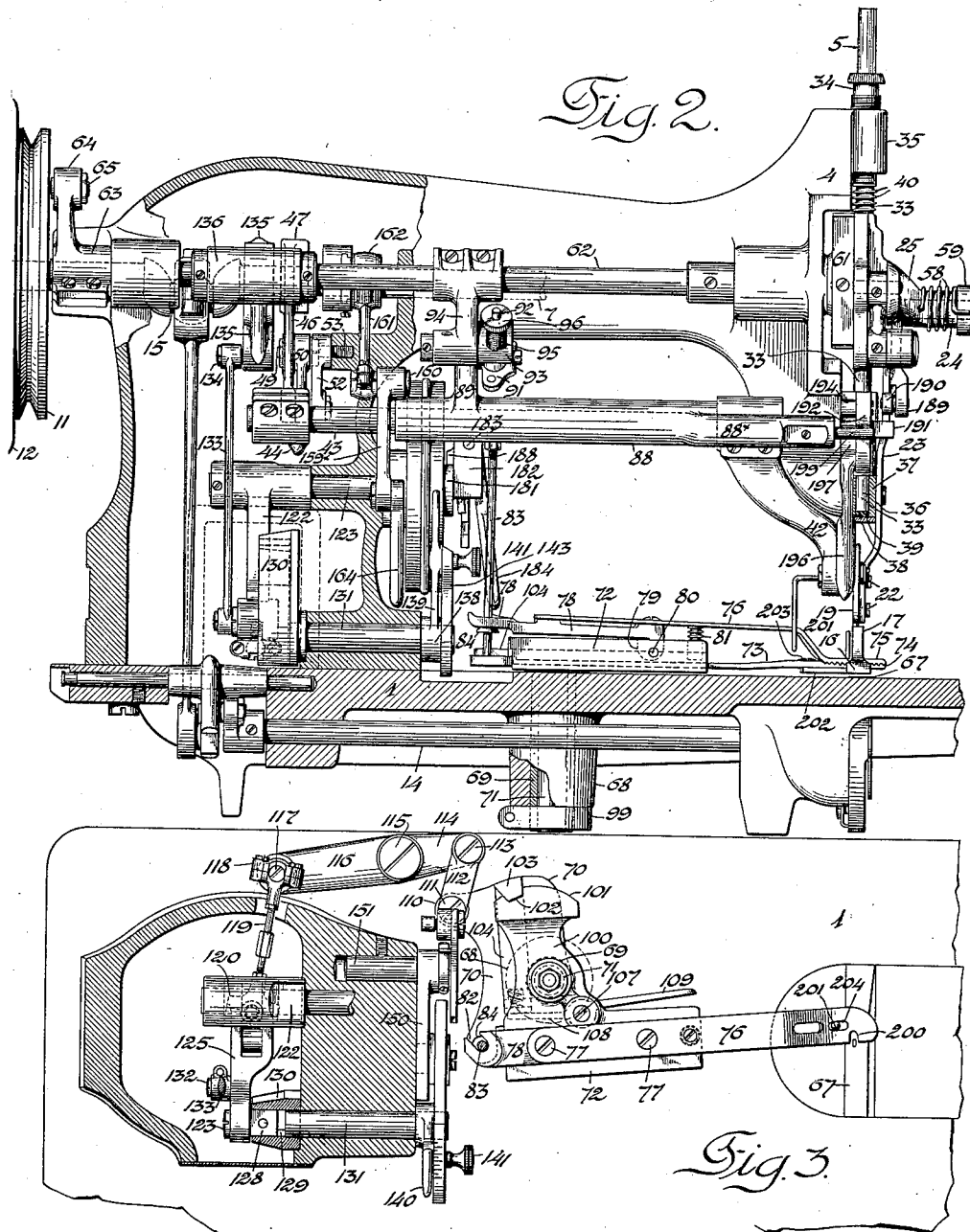
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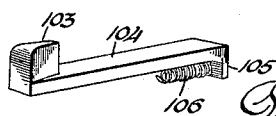
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3 SHEETS—SHEET 3.

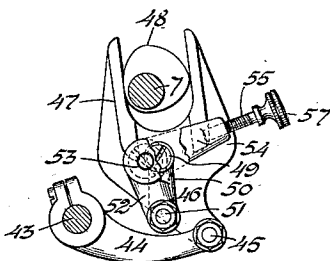
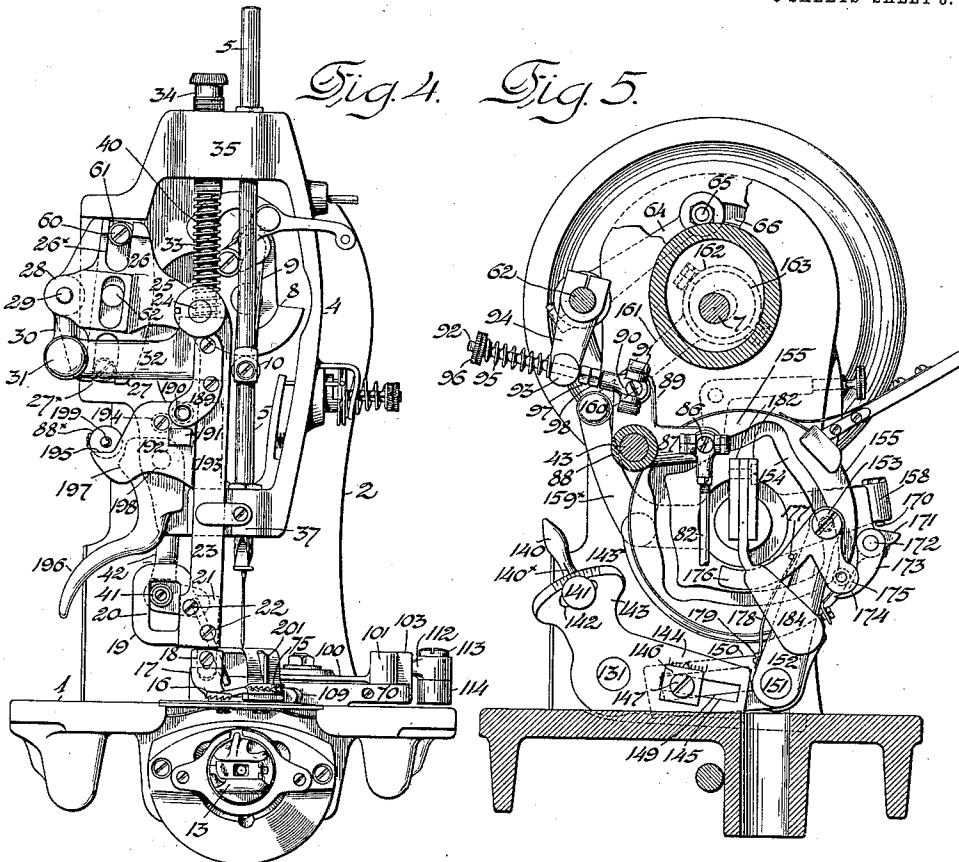


Fig. 6.

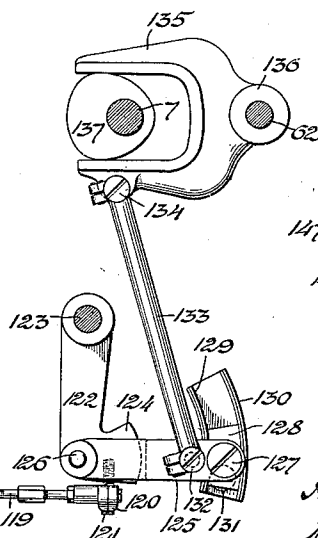


Fig. 7.

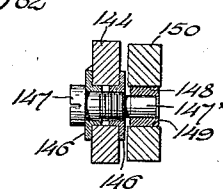


Fig. 10.

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SEWING-MACHINE.

1,009,055.

Specification of Letters Patent.

Patented Nov. 21, 1911.

Application filed October 26, 1909. Serial No. 524,627.

To all whom it may concern:

Be it known that I, ALBERT H. DE VOE, a citizen of the United States, residing at Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Sewing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention has for its object to provide a simple, compact and effective mechanism for stitching together two superposed plies of material and ruffling or fulling the upper ply in certain portions, as in the manufacture of the class of Japanese foot wear known as "tabis"; and the invention consists in certain constructive features herein shown and described, constituting an improvement in the mechanism forming the subject of my United States Patent No. 949,725, dated February 15, 1910.

In the accompanying drawings, Figure 1 is a front side elevation, Fig. 2 a rear side elevation, partly in section, and Fig. 3 a plan in horizontal section through the base of the bracket-arm, representing a machine embodying the present improvements. Fig. 4 is a front end elevation of the machine with the face plate removed, and Fig. 5 a sectional elevation representing certain operative parts in the rearward portion of the machine. Fig. 6 is a detail elevation of the primary feed-actuating mechanism and Fig. 7 a similar elevation of the secondary feed-actuating mechanism. Fig. 8 is a detail view of the pattern-wheel clutch mechanism and Fig. 9 a transverse sectional elevation of the pattern-wheel and certain of its clutch-controlling devices. Fig. 10 is a transverse sectional view of the adjustable connection between two of the levers of the secondary feed-controlling mechanism. Fig. 11 is a perspective view of a detail of the secondary feeding device.

The frame of the machine comprises the bed-plate 1 and hollow bracket-arm comprising the standard 2 and overhanging member 3 terminating in its forward end in the head 4 in which is journaled the reciprocating needle-bar 5 carrying the needle 6. In the member 3 of the frame is journaled the longitudinally extending main-shaft 7 carrying at its forward end the crank-plate 8 provided with the usual crank-pin connected by means of the pitman 9 with a stud

upon the collar 10 fixed upon the needle-bar 5. The main-shaft carries at its rearward end the usual grooved belt-wheel or pulley 11 and balance-wheel 12. Coöperating with the needle is the usual shuttle carrying the thread-case 13, the shuttle being actuated by means of the rock-shaft 14 deriving its operative movements, through suitable connections, from the crank 15 formed in the main-shaft 7.

The primary feeding mechanism comprises the feeding foot 16 whose shank 17 is secured to a depending ear 18 of the plate 19 formed with the rectangular aperture 20 and having a shank 21 secured by screws 22 upon the lower end of the swinging feed-bar 23 fulcrumed at its upper end by means of the pin 24 upon a lateral arm 25 of a rocker formed with upwardly and downwardly extending arms 26 and 27 having slots 26* and 27* and a rearwardly extending arm 28. The rocker-arm 28 is pivotally connected by means of the pin 29 with the upper end of a link 30 whose lower end is pivotally mounted by means of the fulcrum-pin 31 upon a rearwardly extending arm 32 adjustably fixed upon the presser-bar 33. The upper portion of the presser-bar is journaled in the usual adjustable bushing 34 in the bearing boss 35 of the member 4, and the lower portion enters a bearing aperture 36 in the bearing boss 37, the bearing aperture being closed at the lower end by the stop-plate 38 between which and the bottom of the presser-bar is preferably interposed a washer 39 of leather or other suitable yielding material. The usual pressure spring 40 is interposed between the lower end of the bushing 34 and the hub 32* of the arm 32 for pressing the bar 33 normally downward.

The aperture 20 of the plate 19 carried by the feed-bar is entered by a roller-stud 41 projecting laterally from a depending arm 42 fixed upon the forward end of a rock-shaft 43 journaled in suitable bearings of the bracket-arm and provided at its rearward end with a forwardly projecting crank-arm 44 pivotally connected by means of the pin 45 with the lower end of a link-bar 46 provided at its upper end with a yoke 47 embracing the triangular cam 48 fixed upon the main-shaft. The link-bar is pivotally connected by means of the screw-stud 49 with the upper end of a supporting link 50

whose lower end is mounted upon a fulcrum-pin 51 carried by the depending arm 52 of an elbow-lever mounted upon the fixed fulcrum-stud 53 and having a lateral arm 54 carrying the screw 55 which projects through a slot 56 in the upright portion 2 of the bracket-arm and is provided with the head 57. By shifting the position of the elbow-lever 52 54 upon its supporting stud 53, the position of the fulcrum-pin 51 is determined, and hence the path of movement of the pivotal stud 49 with the link 50 under the vibratory movement of the link-bar 46 imparted by the cam 48. This determines the resultant up-and-down movement of the link-bar, and consequently its action upon the crank-arm 44 of the feed rock-shaft 43. As will be observed, the backward movement of the crank-arm 42 imparts through the stud 41 to the plate 19 vibratory movements which communicate operative movements to the feed-bar, the latter being normally pressed forwardly by means of a spring 58 surrounding the fulcrum-pin 24 with one end connected to the rocker-arm 25 and the opposite end secured to the collar 59 fixed upon the outer end of such pin.

Entering the alined slots 26* and 27* of the rocker arms 26 and 27 are roller-studs 60 carried by the cross-bar 61 which is fixed upon the forward end of the rock-shaft 62 having secured upon its rearward end the hub 63 of a crank-arm 64 carrying a roller-stud 65 which enters a feed-lifting cam-groove 66 formed in the forward face of the belt-wheel 11. The parts are so arranged and constructed that the feeding foot remains clamped upon the work until the point of the needle has entered its usual aperture in the throat-plate 67, when the foot promptly rises and moves forward to take a fresh hold upon the goods which it engages just as the needle is about to rise to strip the goods therefrom and insure the proper formation of the needle-loop for seizure by the shuttle. The feeding movement takes place immediately after the needle emerges from the goods. The slot 20 of the plate 19 is somewhat wider than the diameter of the roller-stud 41, and thus forms a yoke-member embracing such roller-stud one branch of which member is normally maintained in contact therewith by the action of the spring 58, so that the operator may manually push the feed-bar to increase the length of the stitch in opposition to the spring 58 in crossing the point of the angle between the divided forward sections of the tabi, the increased throw thus manually produced being determined by the clearance between the stud 41 and side walls of the aperture 20.

Mounted in a bearing boss 68 depending from the bed-plate 1 is the tubular hub 69 extending from the lower face of a swinging carrier-lever 70, and journaled in such

tubular hub is the depending fulcrum-pin 71 of a block 72 channeled in its lower face to receive the arm 73 provided with the lower work-clamping jaw 74, the upper clamping jaw 75 being formed upon the downwardly offset forward end of the arm 76 secured by screws 77 upon the rock-lever 78 which is formed with a depending ear 79 entering a channel in the upper face of a block 72 in which it is pivoted by means of a transverse pin 80. Interposed between the bottom of the arm 76 and the block 72 is a spring 81 adapted to press the clamp-arm 76 upwardly for separating the clamping jaws. The rearward end of the rock-lever 78 is provided with a slot 82 adapted to embrace the pull-rod 83 provided beneath the same with a fixed collar 84 and having at its upper end a strap 85 which embraces a stud 86 carried by a forwardly projecting arm 87 of a tubular rock-shaft 88 mounted upon the feed rock-shaft 43 and provided with an upwardly extending crank-arm 89. The arm 89 carries a stud 90 embraced by a strap 91 at one end of the push-rod 92 which passes loosely through an eye formed in a rocking stud 93 carried by the crank-arm 94 fixed upon the feed-lifting rock-shaft 62, a spring 95 interposed between the stud 93 and a nut 96 upon the rearward end of the push-rod 92 serving to normally maintain seated upon the opposite side of the rocking stud 93 a shoulder of the rod 92 afforded by a nut 97 secured in position by means of a jam-nut 98. As the spring 95 is stronger than the spring 81, it will be observed that the opening and closing of the work-clamping jaws 74 and 75 is controlled by the operation of the feed-lifting rock-shaft 62, the opening of the jaws occurring simultaneously with the lifting of the primary feeding foot 16; while the buffer afforded by the spring 95 intermediate the crank-arm 94 and the push-rod 92 affords a yielding connection between the clamp-closing mechanism and the upper clamp-jaw which adapts the clamp for accommodating different thicknesses of material.

The block 72 is held down close to the bed-plate by means of a collar 99 clamped upon the lower end of the fulcrum-pin 71, and said block is formed with a forwardly projecting arm 100 terminating in a segmental cam edge 101 formed with a wedge-shaped notch 102 which is adapted to be entered by the correspondingly shaped tooth 103 upon the upper face of a latch-bar 104 fitted within a suitable slideway in the top of the carrier-lever 70 and formed at its opposite end with a depending lip 105 between which and a suitable aperture of the lever 70 is interposed the spring 106 adapted to normally maintain the tooth 103 in engagement with the notch of the cam edge 101. Fulcrumed in the forward edge of the block 72 by means

of the screw-pin 107 is a release lever having an arm 108 arranged upon the opposite side of the lip 105 from the spring 106 and having an oppositely extending arm 109 adapted to be pressed by the operator in shifting the latch-bar 104 to retract the tooth 103. The work-clamping members are represented in Fig. 3 in operative position, but when not in use, the actuation of the lever-arm 109 to disengage the tooth 103 from the notch 102 permits the block 72 to be turned around upon its pivotal pin 71 into inoperative position, the notch 82 of the lever 78 being so arranged as to prevent the interference of the pull-rod 83 with such lever.

The carrier-lever 70 is provided with a lateral ear 110 carrying a screw-stud 111 embraced by one end of the link 112 whose other end is entered by the screw-stud 113 upon one arm 114 of a rock-lever fulcrumed upon the fixed screw-stud 115 and having an oppositely extending arm 116 carrying a stud 117 which is embraced by a strap 118 of an adjustable pitman-rod 119 having at its opposite end a similar strap 120 which embraces a stud 121 depending from a swinging crank-arm 122 which is mounted upon the stud 123 fixed in the bracket-arm. The crank-arm 122 is formed with a wing 124 fitted within the forked adjacent end portion of a link 125 pivoted thereto by means of the transverse pin 126 and pivotally connected at its opposite end by means of the screw-pin 127 with a slide-block 128 which is fitted within a segmental guideway 129 of a guide-arm 130 mounted upon the rearward end of the shaft 131 which is journaled in the bracket-arm. The link 125 carries adjacent the block 128 a screw-pin 132 embraced by the lower end of a pitman-rod 133 whose upper end embraces a screw-pin 134 carried by the lower arm of the yoke 135 whose hub 136 is loosely mounted upon the primary feed-lifter rock-shaft 62, said yoke embracing a triangular actuating cam 137 fixed upon the main-shaft 7. As will be observed, the rocking of the yoke 135 under the action of the cam 137 induces through its connection therewith the reciprocating movement of the slide-block 128 which, when the guide-arm 130 is eccentric to the pivotal pin 126, causes the endwise movement of the link 125, the rocking of the crank-arm 122 and consequent reciprocation of the pitman 119, which imparts through the rock-lever 114 116 and link 112 oscillating movements to the carrier-lever 70.

Fixed upon the forward end of the shaft 131 is the hub 138 of a lever 139 terminating in a finger-piece 140 and carrying the clamp-screw 141 whose shank passes through a segmental slot 142 formed in the upwardly extending arm 143 of an angular lever loosely mounted upon the shaft 131 and having a second forwardly projecting arm 144 pro-

vided with a longitudinal slot 145. The segmental upper edge 143* of the arm 143 is provided with a series of graduations co-operating with an index mark 140* of the finger-piece 140 in indicating the position of the guide-arm 130.

Fitted to the slot 145 of the lever-arm 144 are the notched clamp-blocks 146 formed with apertures, one of which is threaded, entered by the clamp-screw 147 whose reduced unthreaded extremity 147* enters an aperture in a slide-block 148 fitted within a longitudinal slot 149 in the lateral arm 150 of a plural-armed lever mounted upon the fixed fulcrum-pin 151 and having an upwardly extending arm 152 which carries at its upper end a shouldered stud 153 which may be provided with an anti-friction roller and which enters the pattern cam-groove 154 formed in the face of a cam-wheel 155 whose hub 156 is loosely mounted upon the stud 123. The rotation of the cam-wheel causes the rocking of the plural-armed lever 150 152 and the corresponding movement of the lever 143 144, and hence of the rock-shaft 131 and the change of inclination of the guide-arm 130 to vary the effect of the actuating cam 137 upon the vibratory work-clamp.

Upon the hub 156 of the cam-wheel is loosely mounted the hub 157 of a rock-lever formed with oppositely extending arms 158 and 159, the latter of which has an upturned portion 159* pivotally connected by means of a pin 160 with one end of an eccentric rod 161 whose other end is provided with a strap 162 embracing an actuating eccentric 163 upon the main-shaft 7. A clamping lever 164 is pivotally connected at one end by means of the pin 165 to the arm 159 of the rock-lever, and is formed at its other end with laterally extending spaced segmental jaws 166 and 167 adapted to loosely embrace the annular flange 155* of the cam-wheel, the jaw 166 having a lug 166* engaged by one end of a spring 168 whose opposite end is seated within a socket in the lateral lug 169 of the rock-lever arm 158. The rocking of the lever 158 159 by its operative connections with the eccentric 163 causes the step-by-step rotary movement of the cam 155 through the action of the clutch-lever 164 thereon, in a manner well-known.

The outer end of the rock-lever arm 158 carries an adjustable stop-pin 170 adapted for engagement by a lateral finger 171 fixed upon a rocking pin 172 journaled in the clutch-lever 164 and carrying a tappet-arm 173. Upon the stud 153 is pivotally mounted an angle-lever having a depending arm 174 carrying a roller-stud 175 adapted to engage the adjacent edge of the tappet-arm 173 and a lateral arm 176 carrying a laterally extending pin 177 engaged by the free

end of a flat spring 178 secured by means of a screw 179 upon the rearward edge of the lever-arm 152. The angle-lever 174 176 is moved to and fro bodily with its supporting lever 152, and is yieldingly pressed by its spring 178 toward the axis of movement of the cam-wheel and thus out of operative relation with the tappet-arm 173.

10 The cam-wheel 155 is formed in its face with a circular recess 180 to receive the head 181 of the supporting stud 123 provided with parallel laterally extending spaced lugs 182 between which is pivoted by means of the screw-pin 183 one end of the latch-lever 184 formed in one edge with a stop tooth 185 and an adjacent clearance notch 186 of substantially the width of the angle-lever-arm 176. The extremity of the stud 123 is formed with a socket between the bottom of which and the adjacent edge of the lever 184 is interposed a spring 187 for pressing the lever normally outward. The lever is provided with a lateral lug 188 adapted to engage the top of the head 181 to limit its outward movement under the action of the spring so as to bring the tooth 185 into the path of movement of the lever-arm 176. As the cam-wheel rotates, the stud 153 moves from one of the high points adjacent the periphery into a lower portion nearer the axis of rotation and outwardly again to a high point, thus causing the lever-arm 152 to move correspondingly in varying the action of the secondary feeding mechanism upon the work. As the angle-lever 174 176 is carried inward toward the axis of movement of the cam, its roller-stud 175 recedes from the tappet arm 173, but in its return movement, the cam-shaped upper edge of the lever-arm 176 engages the stop shoulder of the latch-lever afforded by the tooth 185, which rocks such angle-lever slightly upon the arm 152 and at its extreme outer position causes the roller-stud 175 to forcibly engage the tappet arm 173, thus turning the rocking pin 172 and bringing the finger 171 into engagement with the stop-pin 170, thereby shifting the clutch-lever 164 upon the rock-lever 158 159 and bringing the operative faces of its jaws 166 167 into concentric relation with the cam-wheel flange 155*, thus interrupting the motion of the cam-wheel. When it is desired to throw the cam-wheel into action for a succeeding operation, a pressure of the operator upon the free end of the latch-lever 184 brings its clearance notch 186 into register with the edge of the lever-arm 176, thereby releasing the same and enabling it to be tilted under the action of its spring 178 to disengage the roller-stud 175 from operative relation with the tappet arm 173, whereby the clutch-lever 164 is adapted to resume operative relation with the

cam-wheel flange under the action of the spring 168.

The swinging feed-lever 23 is provided near its upper end with a bracket-piece 189 carrying a roller-stud 190 disposed in the path of vertical movement of a lateral stud 191 upon a cam-shaped lifter-plate 192 having a boss 193 slidably fitted upon the presser-bar beneath the arm 32 and provided with a laterally extending roller-stud 194 and with a rearwardly extending stop-shoulder 195. The usual cam-lever 196 with cam portion 197 is pivotally mounted upon a pin 198, and when lifted engages the roller-stud 194 of the lifter plate to raise the same, whereby the lug 191 engages the roller-stud 190 and operates to lift the feed-lever 23 and the presser-bar by which it is normally sustained through its connections therewith. To insure the simultaneous lifting of the upper jaw of the work-clamp to open the latter simultaneous with the rise of the feeding foot 16, the secondary feed-lifting tubular rock-shaft 88 is provided with a laterally extending and forwardly projecting arm 88* provided with a pin 199 extending above the shoulder 195 of the lifter-plate, whereby the rising of the latter causes the turning of the rock-shaft 88 and consequent lifting of the upper clamp jaw.

As will be observed, the jaws of the work-clamp are provided upon their rearward edges with notches 200 to embrace the needle path so as to permit the forward edge of the clamp to pass slightly beyond the needle path and insure the proper stitching of the fulled material presented thereby, and the lower jaw is provided with a guide-pin 201 passing through a slot 204 in the upper jaw, the guide-pin being carried by a plate 202 secured adjustably by means of the fastening screw 203 to the bottom of the lower work holder arm 73. The function of this guide-pin is to guide the edge of the work as it is advanced to the stitch-forming mechanism.

The general mode of operation of the machine embodying the present improvements is substantially the same as that of the machine shown and described in my prior Patent No. 949,725, to which reference may be had, the operation of certain of its groups of mechanism differing from the previous construction being set forth in the foregoing description.

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

1. In a sewing machine, the combination with the frame comprising a bed-plate and an overhanging bracket-arm, and a throat-plate mounted upon the bed-plate, of a swinging feed-bar above the bed-plate, a feeding foot secured to said feed-bar, a presser-bar mounted in bearings in the bracket-arm, a support for said swinging

feed-bar sustained by the presser-bar, a stop applied to one of the presser-bar bearings in alinement with the presser-bar and adapted to engage the same and limit its movement toward the throat-plate, and means for imparting to the feed-bar lateral feeding movements and rising and falling movements relatively to the presser-bar.

2. In a sewing machine, the combination with the frame comprising a bed-plate and an overhanging bracket-arm, and a throat-plate mounted upon the bed-plate, of a swinging feed-bar above the bed-plate, a feeding foot secured to said feed-bar, a presser-bar mounted in the bracket-arm, a support for said swinging feed-bar sustained by the presser-bar, actuating means including a laterally reciprocating member for imparting swinging movements to the feed-bar, a loose connection between said feed-bar and said reciprocating member and including a pin and an embracing yoke having a width materially exceeding that of the pin, a spring acting in opposition to the operative movements of said reciprocating member for maintaining said pin normally in engagement with the same side of the yoke, and means for imparting rising and falling movements to the feed-bar relatively to the presser-bar.

3. In a sewing machine, the combination with the frame comprising a bed-plate and an overhanging bracket-arm and a throat-plate mounted upon the bed-plate, of a swinging feed-bar above the bed-plate, a feeding foot secured to said feed-bar, a presser-bar mounted in the bracket-arm, a fulcrum-pin carried thereby, a rocker supported by said fulcrum-pin, a fulcrum-pin carried by said rocker upon which the feed-bar is mounted, a spring applied to the presser-bar for forcing it downwardly, means for imparting lateral feeding movements to the feed-bar, means applied to and having a vertically sliding connection with said rocker for imparting rising and falling movements to the feed-bar, and a lifting device acting upon the feed-bar to lift said rocker bodily and with it the presser-bar.

4. In a sewing machine, the combination with primary feeding mechanism including a feed-bar and a feeding foot carried thereby, actuating means for imparting lateral feeding movements to said feed-bar and a spring for pressing the feed-bar normally downward, of secondary feeding mechanism including a vibrating carrier, a work-clamp mounted thereon including a lower jaw fixed in relation to the carrier and an upper jaw movable toward and from the same on said carrier, means for imparting lifting movements to said feed-bar, means yieldingly connected therewith for imparting opening and closing movements to said work-clamp, and means for imparting to the work-clamp

carrier operative vibratory movements synchronous with the feeding movements of the feed-bar.

5. In a sewing machine, the combination with a feed-bar, a feeding foot secured thereto, a rock-shaft operatively connected with said feed-bar for imparting lateral feeding movements thereto, and a feed-lifting rock-shaft operatively connected with said feed-bar for imparting rising and falling movements thereto, of a feeding work-clamp having an upper jaw movable toward and from the lower jaw, a clamp operating rock-shaft connected with the upper work-clamping jaw and adapted to effect the opening and closing of the same, a yielding connection between the feed-lifting and clamp operating rock-shafts, and means for vibrating said work-clamp synchronously with the feeding movements of said feed-bar.

6. In a sewing machine, the combination with a feed-bar, a feeding foot secured thereto, a rock-shaft operatively connected with said feed-bar for imparting lateral feeding movements thereto, and a feed-lifting rock-shaft provided with a crank-arm and operatively connected with said feed-bar for imparting rising and falling movements thereto, of a feeding work-clamp having an upper jaw movable toward and from the lower jaw, a clamp operating rock-shaft provided with a plurality of crank-arms, a connection between one of the last named crank-arms and the upper jaw of said feeding work-clamp, a yielding connection intermediate the second of the crank-arms of the clamp-actuating rock-shaft and the said crank-arm of the feed-lifting rock-shaft whereby the operative movements of one are imparted to the other of said rock-shafts, and means for vibrating said work-clamp synchronously with the feeding movements of said feed-bar.

7. In a sewing machine, the combination with primary feeding mechanism, of a feeding work-clamp having a lower jaw and an upper jaw movable toward and from the same, means for imparting feeding movements thereto and comprising a rotary actuating cam, a swinging and endwise reciprocating rod deriving reciprocating movements therefrom, a link connected adjacent one end with said rod and with a slide-block, a guide-arm formed with a slide-way entered by said block, a swinging arm connected with the opposite end of said link, a rock-lever having a connection with said work-clamp, a pitman connection between the rock-lever and said swinging arm, and automatically acting means whereby the clamp is opened and closed between consecutive feeding actions.

8. In a sewing machine, the combination with primary feeding mechanism, of a feed-

- ing work-clamp having a lower jaw and an upper jaw movable toward and from the same, means for imparting feeding movements thereto and comprising a rotary actuating cam, a swinging lever formed with a yoke embracing said cam, a swinging and endwise reciprocating rod connected with and deriving reciprocating movements from said swinging lever, a link connected adjacent one end with said rod and with a slide-block, a guide-arm formed with a slide-way entered by said block, a swinging arm connected with the opposite end of said link, a rock-lever having a connection with said work-clamp, a pitman connection between the rock-lever and said swinging arm, and automatically acting means whereby the clamp is opened and closed between consecutive feeding actions.
9. In a sewing machine, the combination with primary feeding mechanism, of a feeding work-clamp having a lower jaw and an upper jaw movable toward and from the same, means for imparting feeding movements thereto and comprising a rotary actuating cam, a swinging and endwise reciprocating rod deriving reciprocating movements therefrom, a link connected adjacent one end with said rod and with a slide-block, a swinging arm connected with the opposite end of said link, a guide-arm formed with a slide-way entered by said block, a rocking pin upon which said guide-arm is fixed, a second arm fixed upon said rocking pin, an arm loosely mounted upon said rocking pin, means for imparting to-and-fro movements thereto, an adjustable connection intermediate said fixed and loosely mounted arms, a rock-lever having a connection with said work-clamp, a pitman connection between the rock-lever and said swinging arm, and automatically acting means whereby the clamp is opened and closed between consecutive feeding actions.
10. In a sewing machine, the combination with primary feeding mechanism, of a feeding work-clamp having a lower jaw and an upper jaw movable toward and from the same, means for imparting feeding movements thereto and comprising a rotary actuating cam, a swinging and endwise reciprocating rod deriving reciprocating movements therefrom, a link connected adjacent one end with said rod and with a slide-block, a swinging arm connected with the opposite end of said link, a guide-arm formed with a slideway entered by said block, a rocking pin upon which said guide-arm is fixed, a second arm fixed upon said rocking pin, an arm loosely mounted upon said rocking pin, means for imparting to and fro movements thereto, an adjustable connection intermediate said loosely mounted arm and its actuating means whereby the extent of its operative movements may be varied, an adjustable connection intermediate said fixed and loosely mounted arms, a rock-lever having a connection with said work-clamp, a pitman connection between the rock-lever and said swinging arm, and automatically acting means whereby the clamp is opened and closed between consecutive feeding actions.
11. In a sewing machine, the combination with primary feeding mechanism, of a feeding work-clamp having a lower jaw and an upper jaw movable toward and from the same, means for imparting feeding movements thereto and comprising a rotary actuating cam, a swinging and endwise reciprocating rod deriving reciprocating movements therefrom, a link connected adjacent one end with said rod and with a slide-block, a swinging arm connected with the opposite end of said link, a guide-arm formed with a slideway entered by said block, a rocking pin upon which said guide-arm is fixed, a second arm fixed upon said rocking pin and provided with an index mark, an arm loosely mounted upon said rocking pin adjacent the fixed arm and provided with a graduated segment overlying the same, means for imparting to-and-fro movements to the loosely mounted arm, an adjustable connection intermediate said fixed and loosely mounted arms, a rock-lever having a connection with said work-clamp, a pitman connection between the rock-lever and said swinging arm, and automatically acting means whereby the clamp is opened and closed between consecutive feeding actions.
12. In a sewing machine, the combination with primary feeding mechanism, of a secondary feeding device, actuating mechanism therefor, and a controlling device for said actuating mechanism comprising a rotary cam, a follower therefor connected with and adapted to vary the relation of operative members of said actuating mechanism, a cramping lever in normal operative relation with said cam, an operating lever pivotally connected with said cramping lever, actuating means for said operating lever, a spring interposed between said levers for maintaining said cramping lever yieldingly in operative relation with the cam, a rocking device applied to one of said levers and provided with a finger adapted to engage a shoulder or abutment upon the other of said levers for relatively moving them in opposition to said spring, and having a tappet arm, an angle-lever carried by and movable with the follower of said cam and having an arm adapted to engage the said tappet arm and a lateral arm extended toward the central portion of said cam, a spring for maintaining said angle-lever out of operative relation with the tappet arm, and a spring-pressed latch-lever movable transversely of said an-

gle-lever and provided with a stop-shoulder normally in the path of movement of the lateral arm of said angle-lever and with an adjacent clearance recess adapted to be entered by said lateral arm.

13. In a sewing machine, the combination with the frame comprising a bed-plate and an overhanging bracket-arm, and a main-shaft journaled in said bracket-arm, of a swinging feed-bar, a feeding foot secured thereto, lifting means for said feed-bar, and actuating means for imparting lateral feeding movements to said feed-bar and comprising a rock-shaft journaled in the bracket-arm parallel with the main-shaft, an actuating cam on the main-shaft, a link-bar formed with a yoke embracing said cam, a crank-arm on said rock-shaft pivotally connected with said link-bar, a swinging feed-regulator lever mounted upon a fixed support and having an arm carrying a fulcrum-pin, and a link mounted upon said fulcrum-pin and pivotally connected with said link-bar adjacent its yoke, and a secondary feeding mechanism with means for actuating the same synchronously with the primary feeding mechanism.

14. In a sewing machine, the combination with the frame comprising a bed-plate and

an overhanging bracket-arm, and a main-shaft journaled in said bracket-arm, of primary and secondary feeding mechanisms comprising a swinging feed-bar mounted in the bracket-arm and provided with a feeding foot, a swinging work-clamp mounted upon the bed-plate and provided with a lower jaw and an upper jaw movable toward and from the same, a primary feed-actuating rock-shaft and primary and secondary feed-lifting rock-shafts all mounted in the bracket-arm parallel with the main-shaft, operative connections intermediate the primary feed-actuating and lifting rock-shafts and said feed-bar, a connection intermediate the primary and secondary feed-lifting rock-shafts, an operative connection intermediate the secondary feed-lifting rock-shaft and the movable jaw of the swinging work-clamp for lifting the latter, and actuating means for imparting lateral feeding movements to said work-clamp.

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

ALBERT H. DE VOE.

Witnesses:

HENRY J. MILLER,

HENRY A. KORNEMANN, Jr.