July 28, 1942. F. F. ZEIER 2,291,129

FEEDING MECHANISM FOR SEWING MACHINES

Original Filed April 15, 1939 4 Sheets-Sheet 1

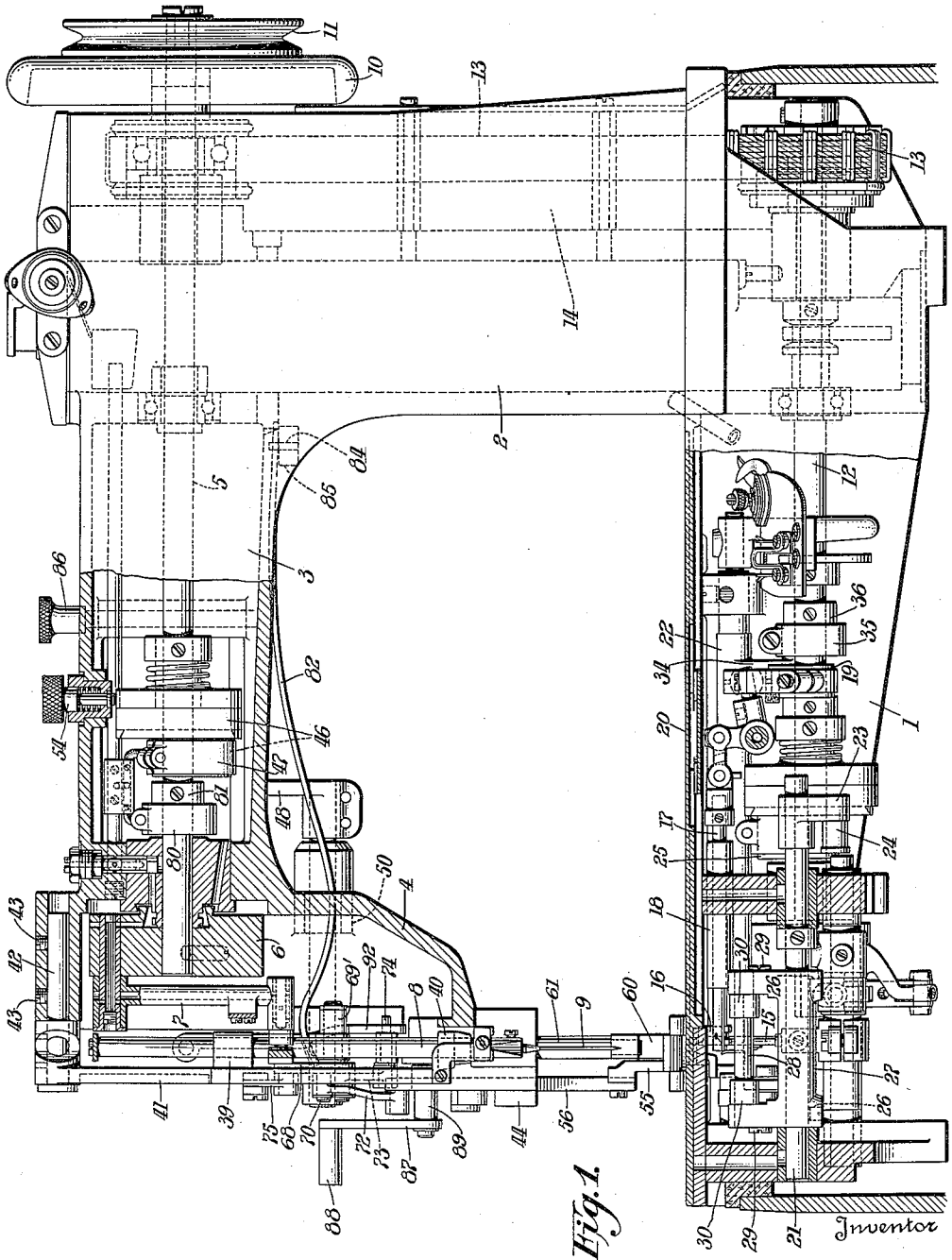


Fig. 1.

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FEEDING MECHANISM FOR SEWING MACHINES

Original Filed April 15, 1939 4 Sheets-Sheet 2

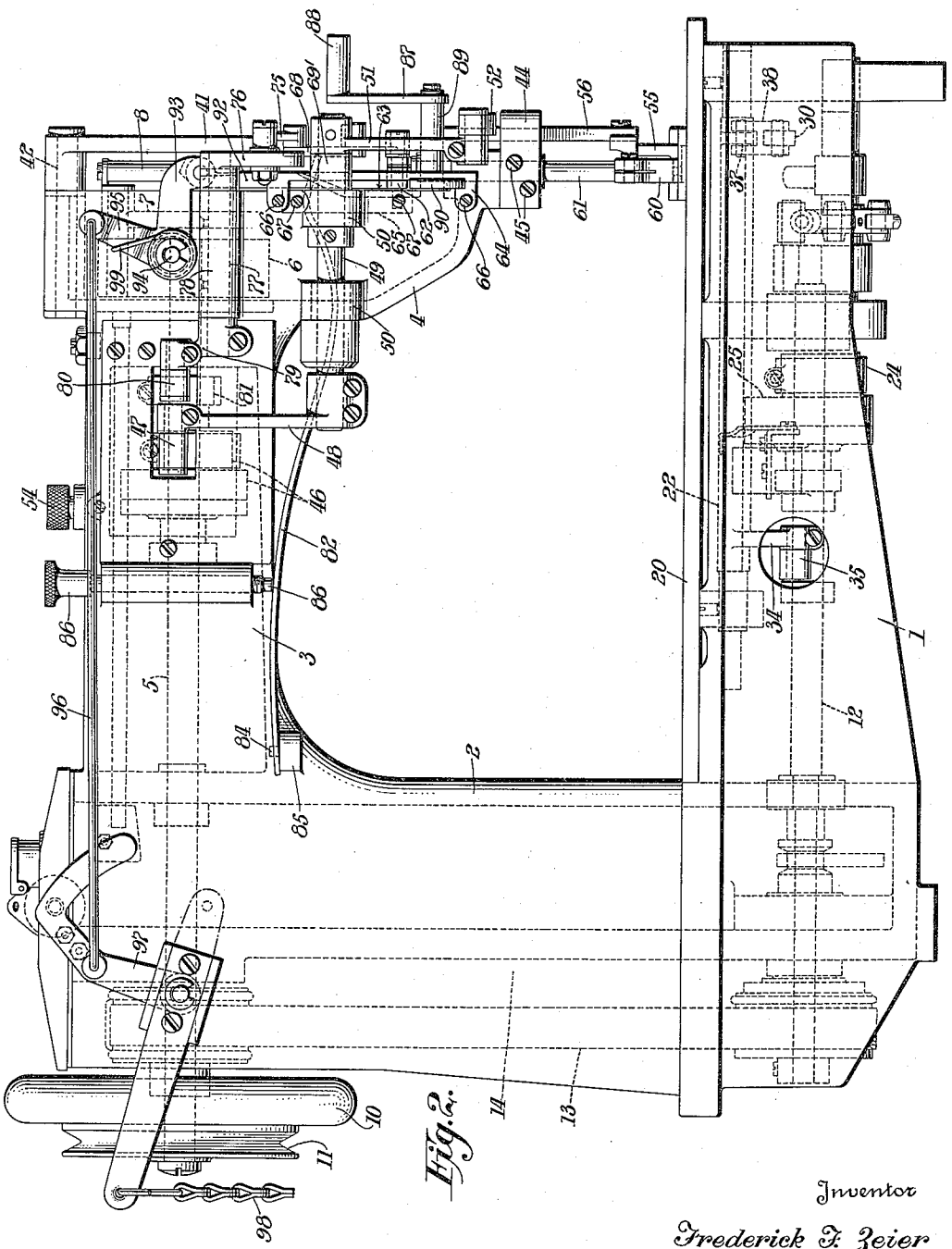


Fig. 2.

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FEEDING MECHANISM FOR SEWING MACHINES

Original Filed April 15, 1939 4 Sheets-Sheet 3

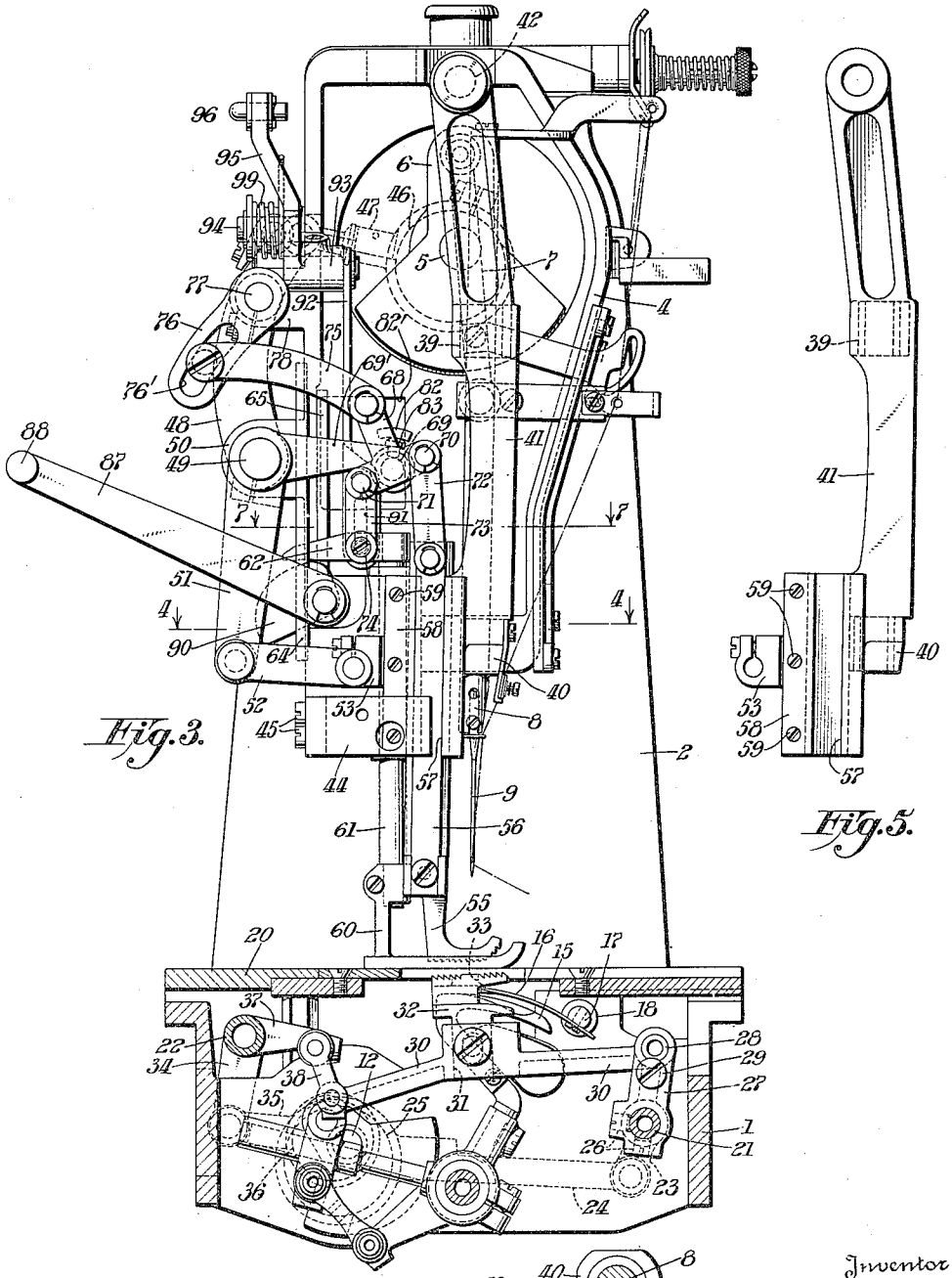


Fig. 3.

Fig. 5.

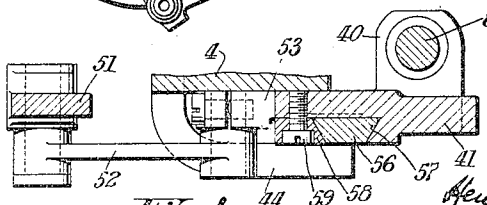


Fig. 4.

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FEEDING MECHANISM FOR SEWING MACHINES

Original Filed April 15, 1939 4 Sheets-Sheet 4

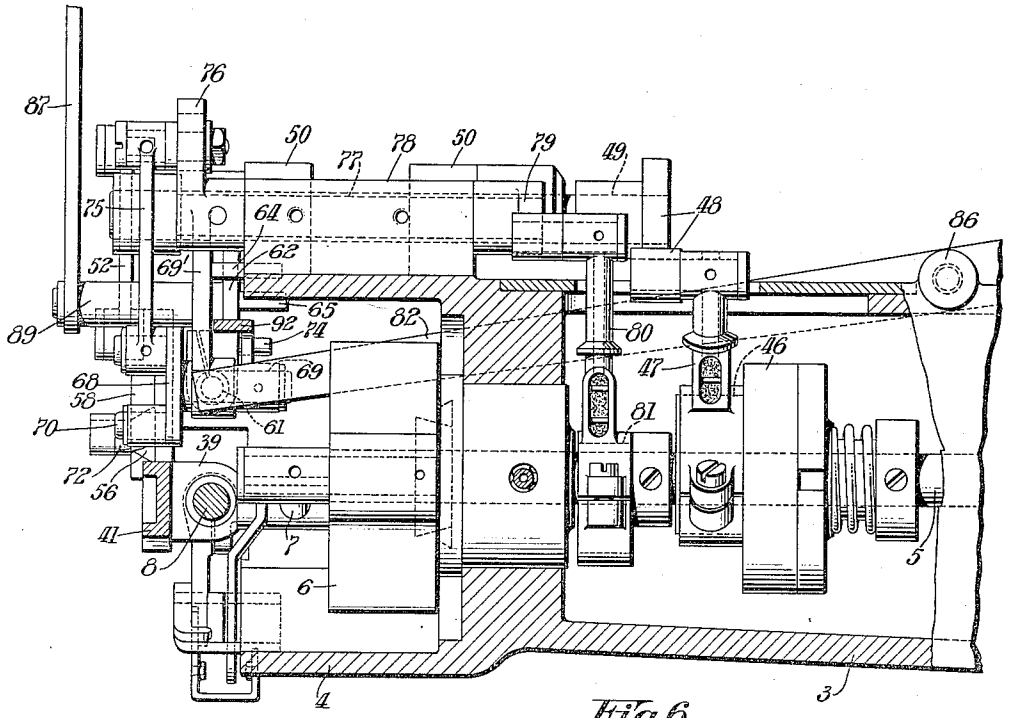


Fig. 6.

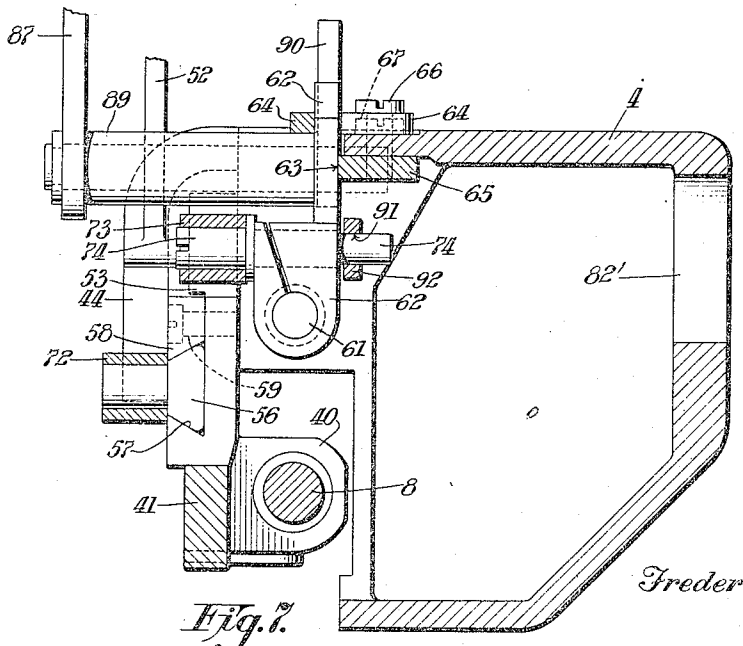


Fig. 7.

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Patented July 28, 1942

2,291,129

UNITED STATES PATENT OFFICE

2,291,129

FEEDING MECHANISM FOR SEWING MACHINES

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Original application April 15, 1939, Serial No. 267,958. Divided and this application April 30, 1940, Serial No. 332,441

12 Claims. (Cl. 112—207)

This invention relates to sewing machines of the straightaway feed type and it has for its primary object the provision of an improved work-feeding mechanism designed and actuated so that the superimposed plies of material are each fed through the sewing machine at the same rate and without any relative movement of the plies of material during the feeding thereof.

Another object of the invention is to provide a feeding mechanism of the above type wherein the feed-bar supporting the usual feed-dog and the presser-bar supporting the usual presser-foot are actuated by connections designed and arranged to eliminate side-thrusts between the feed-bar and presser-bar in their respective bearings, thereby enabling the feeding mechanism to be operated at a comparatively high rate of speed.

With these and other objects in view which will more fully appear, the nature of the invention will be more clearly understood by following the description, the appended claims, and the several views illustrated in the accompanying drawings.

In the drawings:

Fig. 1 is a front side elevation of a sewing machine embodying the invention, with portions of the bracket-arm and bed in section to show the internal mechanism.

Fig. 2 is a rear side elevation of the sewing machine.

Fig. 3 is a front end elevation of the sewing machine with the bed in section.

Fig. 4 represents a vertical section taken substantially along the line 4—4, Fig. 3.

Fig. 5 is a detail view in elevation of the feed-frame in which are journaled the reciprocatory needle-bar and the feed-bar.

Fig. 6 is a top plan sectional view of the front-end portion of the bracket-arm, illustrating the internal mechanism.

Fig. 7 represents a horizontal section through the head of the machine taken substantially along the line 7—7, Fig. 3.

This application is a division of my copending application Serial No. 267,958, filed April 15, 1939.

The general constructive features of the sewing machine chosen for illustration of the present improvement are described in detail in the above mentioned pending application, and in this application only such reference will be made to the various elements of the machine as will assist in a clear understanding of the present invention.

The sewing machine comprises a frame having a bed 1 from one end of which rises a standard 2 of an overhanging bracket-arm 3 terminating in a head 4. Journaled in suitable bearings in the bracket-arm 3 is a rotary main- or arm-shaft 5 having fastened thereon at one end a counterbalanced crank 6 connected by a link 7 to a reciprocatory needle-bar 8 carrying at its lower end an eye-pointed needle 9. At the standard-end of the machine the arm-shaft 5 has secured thereto a balance-wheel 10 having formed therein a belt-groove 11 adapted to receive a belt (not shown) actuated by any suitable power source.

Journaled in bearings in the bed 1 is a rotary bed-shaft 12 connected to be rotated at a one-to-one ratio from the arm-shaft 5 by a conventional clip-belt 13 operating within a belt-compartment 14 in the standard 2. Adjacent the head-end of the machine, the rotary bed-shaft 12 is connected by a suitable linkage to a chain-stitch looper 15 which is of the threaded two-motion type and is adapted to be oscillated in a vertical plane parallel to the direction of feed, the loop-seizing motion being in a direction opposite to the direction of feed of the work through the machine. The looper actuating linkage is fully illustrated and described in my copending application above referred to and, therefor, need not be described further herein. To assist in stitch-formation, the two-motion looper 15 has cooperating therewith a spreader 16 which is adapted to engage one limb of the looper-thread-loop on the looper to distend the same and form the usual thread-triangle with the previous needle-thread-loop which is about the blade of the looper for entrance by the descending needle 9. The spreader 16 is reciprocated horizontally crosswise of the vertical plane of movement of the looper 15 by a supporting shaft 17 (Fig. 1) endwise movable in its bearing-bushing 18 through connections operated by an eccentric 19 fixed to rotate with the bed-shaft 12.

Located beneath the cloth-plate 20 on the bed 1 is preferably a lower four-motion feeding mechanism which operates in synchronism with the top-feed later to be described. This four-motion feed (Fig. 3) preferably comprises a feed-advance and -return rock-shaft 21 and a feed-lift rock-shaft 22 disposed on opposite sides of the bed-shaft 12. The feed-advance and -return rock-shaft 21 is journaled in suitable bushings in the machine-bed 1 and has clamped upon the inner end thereof a depending rock-lever 23, the lower end of which is connected by a pitman 24 to an adjustable eccentric 25 upon the bed-shaft 12. The elements of the eccentric 25 are identical with the eccentric disclosed in the United States patent to W. Myers, No. 2,128,031, dated Aug. 23,

1938. Secured by screws 26 upon the outer end-portion of the rock-shaft 21 is the usual upstanding feed-rocker 27 carrying at its upper end a hollow fulcrum-bar 28 held against endwise displacement by the cap-screws 29 threaded into the feed-rocker 27. Journaled upon the fulcrum-bar 28 is the bifurcated end of a feed-bar 30 formed with a guideway 31 (Fig. 3) entered by the shank of the lower feed-dog 32. Formed in the feed-dog 32 is a needle-aperture 33 which is adapted to receive the needle 9 and back up the same during feeding of the work.

The feed-lift rock-shaft 22 is supported at its opposite ends by suitable pintles fixed in the bed 1. Depending from the inner end of the feed-lift rock-shaft 22 is a rock-lever 34 whose lower end is connected by a short pitman 35 actuated by an eccentric 36 fastened upon the bed-shaft 12. Extending horizontally and forwardly from the outer end of the feed-lift rock-shaft 22 is a rock-lever 37 (Fig. 3), the free end of which is connected by the parallel depending links 38 to the free end of the feed-bar 30.

It will be understood from the above description that the feed-dog 32 has imparted to it the usual four motions necessary to feed the work through the machine, and that the extent of the feed-advance of the work per needle reciprocation can be controlled by the adjustable eccentric 25.

Referring now to the mechanism above the bed 1 and within the bracket-arm 3 and head 4, the needle-bar 8 is journaled for endwise reciprocation in the two spaced lugs 39 and 40 formed on a vibratory frame 41 pivotally hung at its upper end upon a stud 42 secured by screws 43 in the top of the head 4. The lower end of the vibratory frame 41 is steadied in its movement in the line of feed by an L-shaped bracket 44 which is secured by screws 45 to the machine-head 4. The needle 9 is adapted to be vibrated in the line of feed in timed relation with the various feeding elements, and to this end there is provided on the arm-shaft 5 an adjustable eccentric 46 connected to the vibratory frame 41 by means clearly disclosed in Figs. 2, 3 and 6. Referring particularly to Figs. 2 and 6, it will be observed that embracing the eccentric 46 is a short rearwardly extending pitman 47 connected to the upper end of a vertically disposed rock-lever 48 clamped at its lower end upon the end of a feed-advance rock-shaft 49 journaled in spaced lugs 50 on the rear wall of the head 4. Pinned upon the other end of the rock-shaft 49 is the upper end of the depending rock-lever 51 connected at its lower end by a horizontal link 52 to a split projection 53, see Fig. 5, formed upon the vibratory frame 41.

To provide for changing the amplitude of vibration of the needle, i. e., to change the length of stitch, provision must be made to permit adjustment of the amount of vibratory movement imparted to the needle. In the present case, the eccentric is constructed so that its eccentricity may be conveniently adjusted laterally of the arm-shaft 5 to give the desired stitch-length. To assist in effecting adjustment of the eccentric 46, there is provided in the top of the bracket-arm 3 a detent 54 which is adapted to be depressed by the operator and to enter a suitable stop-notch in the adjusting member of the eccentric 46, permitting the operator to turn the balance-wheel 10 and adjust the eccentricity of the eccentric. For a complete disclosure of the detent 54, reference may be had to the U. S. patent to W. Myers, No. 2,063,264, dated Dec. 8, 1936.

In a machine having an upper feeding mechanism and a lower feeding mechanism, each deriving its work-advancing movements from independent adjustable eccentrics, means must be provided to enable the two feeding mechanisms to remain in unison during the adjustment of the stitch-length. The means employed in the present machine is identical with that shown and described in my copending application, Serial No. 267,958, of which this is a division, and for a detailed description of such means reference may be had to the above mentioned pending application.

Considering now the upper four-motion feeding mechanism which assists the needle in advancing the work and is designed to cooperate with the presser-mechanism, the upper feeding mechanism comprises a feed-dog 55 carried in the usual way upon the lower end of a feed-bar 56 slidable in a vertical dovetailed guideway 57 formed in the vibratory frame 41. From Figs. 4 and 5, it will be observed that in order to take up wear, and also to facilitate manufacture, one side of the dovetailed guideway 57 is in the form of a detachable gib 58 secured by screws 59 threaded into the vibratory frame 41.

Disposed adjacent the feed-dog 55 is a presser-foot 60 attached to the lower end of an endwise movable presser-bar 61 journaled in a fixed bushing in the head 4 of the machine. Clamped upon the upper end of the presser-bar 61 is a horizontal guide-arm 62, Fig. 7, the free end of which is adapted to enter the usual presser-bar guide-slot 63 provided in the rear wall of the machine-head 4. This guide-slot 63, in the present case, is preferably formed of two parallel hardened steel runners 64 and 65 secured one upon the outside of the wall of the machine-head 4 and the other upon the inside of the wall of the machine-head by screws 66 and 67.

Positioned directly above the upper ends of the feed-bar 56 and the presser-bar 61 is an inverted T-shaped oscillatable angle-lever 68 provided at the junction of the limbs thereof with a horizontally disposed fulcrum-pin 69 which is journaled in the end of a fulcrum-arm 69' freely pivoted upon the rock-shaft 49 adjacent the depending rock-lever 51. The ends of the substantially horizontal limb of the angle-lever 68 are provided with pivot-pins 70 and 71, Fig. 3. Pin 70 is connected by a depending link 72 to the upper end of the feed-bar 56, and the pin 71 is connected by a depending link 73 to a lifting pin 74 carried by the presser-bar guide-arm 62. The upstanding limb of the angle-lever 68 is connected by the curved link 75 to the slotted rock-lever 76 pinned upon one end of a feed-lift rock-shaft 77 journaled in a lug 78 integral with the rear wall of the machine-head 4. Clamped upon the other end of the feed-lift rock-shaft 77 is the upstanding rock-lever 79, the upper end of which is connected by a pitman 80 actuated by an eccentric 81 secured upon the arm-shaft 5.

Referring to Figs. 3 and 6, it will be seen that the free end of the arm 69' provides a floating fulcrum for the inverted T-shaped angle-lever 68, and that its turning movements are about the axis of the rock-shaft 49 upon which it is freely journaled. The provision of the floating fulcrum for the angle-lever 68 in combination with the two links 72 and 73 connecting the angle-lever to the upper ends of the feed-bar 56 and presser-bar 61 makes toward a top-feed mechanism wherein the necessary actuating movements may be transmitted to the respective elements

without undue binding or side-thrust between the feed-bar 56 and the presser-bar 61 with their respective bearing surfaces. The elimination of this reaction permits the operation of the top-feed at a higher rate of speed with a minimum of spring-pressure. The arm 69' and the mechanism connected thereto are depressed into contact with the work preferably by a leaf-spring 82 of which the inner end projects through a clearance opening 82' in the head 4. This inner end is slightly concaved and engages the semi-spherical head of the screw 83 projecting upwardly from the free end of the arm 69'. The other end of the leaf-spring 82 is apertured to receive the retaining pin 84 of the lug 85, and intermediate the ends of the leaf-spring there is provided an adjusting screw 86 for regulating the amount of pressure applied by the spring.

Considering the top feeding mechanism in the position illustrated in Fig. 3, the operation thereof is as follows: Rotation of the arm-shaft 5 imparts to the angle-lever 68, through the eccentric 81 and the connections actuated thereby, a constant oscillatory motion about the axis of the fulcrum-pin 69. When the presser-foot 60 engages the work, or the throat-plate as shown in Fig. 3, and the rock-lever 76 moves in a clockwise direction about the axis of the feed-lift rock-shaft 77, the pin 71 of the angle-lever 68 becomes the pivot-point about which the angle-lever turns. Further movement of the rock-lever 76 in the same direction (clockwise) raises the feed-bar 56 through the link 72 and also elevates to a small extent the spring-biased end of the arm 69'. When the feed-dog 55 carried by the feed-bar 56 is thus lifted from the work, the needle 9 also being out of the work, the vibratory frame 41, which carries the needle-bar 8 and the feed-bar 56, is shifted to the right through vibration of the rock-lever 51, Fig. 3, or, in other words, given its feed-return movement. At the end of this feed-return movement, the oscillation of the rock-lever 76 in a counterclockwise direction causes a turning of the angle-lever 68 about the pivot-pin 69 in a clockwise direction, which results in a lowering of the feed-dog 55 into contact with the work, in which position the pin 70 carried by the angle-lever 68 becomes the pivot-point about which the angle-lever turns. Further movement of the rock-lever 76 in the counterclockwise direction raises the presser-bar 61 through the link 73. When the presser-foot is thus raised from the work, the vibratory frame 41 carrying the needle-bar 8 and the feed-bar 56 has imparted to it, through its actuating connections previously described, the feed-advance movement. In the machine chosen for illustration, this sequence of operations is repeated in timed relation with the lower four-motion feed previously described.

In order that the amount of elevation of the presser-foot and feed-dog may be varied to compensate for the different thicknesses of materials sewn, the rock-lever 76 is slotted, as at 76', and has adjustably clamped thereto the curved link 75. Adjustment of the end of the link 75 in the slot 76' varies the amount of oscillation imparted to the angle-lever 68 which controls the height to which the presser-foot 60 and feed-dog 55 are raised.

From Figs. 1 and 3, it will be seen that in order to obtain a comparatively long stitch, the feed-bar 56 is spaced to the left of the vertical plane containing the longitudinal axes of the needle-bar 8 and the presser-bar 61, and also rearwardly of the needle-bar 8 so that the feed-bar 56 can move backwardly during the feed-stroke to a position substantially at the side of the presser-bar 61. With the view of obtaining a more smoothly acting top feeding mechanism, and to minimize the endwise movement of the feed-bar 56 in its bearings 39 and 40 during the vibration of the frame 41, the axis of the stud 42 upon which the frame is pivotally hung is in a plane which lies substantially midway between the longitudinal axes of the feed-bar 56 and the needle-bar 8, see Fig. 3.

From the above description, it will be understood that I have invented a top feeding mechanism which, in its operation, is exceedingly flexible and capable of a high speed of operation. Moreover, since only a relatively small spring pressure is required to maintain the presser-foot or feed-dog in contact with the upper surface of the work, the top-feed may be operated at a high speed without the excessive pounding of the feed-dog or presser-foot on the work-support, which heretofore has been present in other top feeding mechanisms. While in the present disclosure the top-feed is shown in combination with a lower four-motion feed, it is to be understood that the top-feed may be used by itself or with any other type of lower feed, such as a wheel-feed or a puller-feed.

The presser-foot 60 and the top feed-dog 55 are adapted to be raised either by the usual hand-controlled lifting lever or by knee- or foot-operated mechanism. The preferred form of hand-controlled lifting lever comprises a rearwardly extending lever 87 provided with a handle 88 at its free end, and at its other end with a relatively long hub 89 formed with a lifting cam 90. As the lever 87 is raised, the lifting cam 90 engages under the presser-bar guide-arm 62 which is clamped upon the presser-bar 61, thereby elevating the presser-foot from the work. The raising of the presser-bar guide-arm 62 transmits a lifting force through the link 73 and the angle-lever 68 of the top feeding mechanism to the free end of the arm 69', which causes the same to turn in a counterclockwise direction about the rock-shaft 49 in opposition to the leaf-spring 82. The turning of the arm 69' in a counterclockwise direction obviously elevates the top feed-bar 56 which is connected to the arm 69' through the link 72 and the angle-lever 68. From the above it will be understood that a raising of the lever 87 will elevate both the presser-foot 60 and the feed-dog 55.

The presser-bar guide-arm 62 is clamped upon the upper end of the presser-bar 61 by a lifting pin 74, the inner end of which is received in a vertically disposed clearance slot 91 formed in the lower end of a link 92 connected at its upper end to the horizontal arm 93 of a bell-crank lever pivoted upon a fulcrum-stud 94 projecting from the rear wall of the machine-head 4. Fastened upon the upstanding arm 95, which forms the other limb of the bell-crank lever, is a comparatively long wire link 96 secured at its other end to a second bell-crank lever 97 connected by a chain 98 to a common form of knee-shift or treadle device.

The hand-controlled lifting lever 87 can be actuated independently of the knee- or foot-operated mechanism for a major portion of its arc of movement by virtue of the clearance slot 91 formed in the link 92. It will be appreciated that a raising of the hand-controlled lever 87 results in a moving of the pin 74 from the lower end of the clearance slot 91 to the upper end of

the clearance slot, without imparting any movement to the knee- or foot-operated mechanism until the pin engages the upper end of the slot 91. In order to maintain the link 92 in its lowest position, the arm 95 of the bell-crank lever has bearing against it a spring 99 which is coiled about and secured to the fulcrum-stud 94 of the bell-crank lever.

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

1. In combination, in a sewing machine having a frame including a work-support; a reciprocatory presser-foot carrying bar; a feeding-foot carrying bar mounted for endwise reciprocatory and laterally vibratory work-feeding movements; a fulcrum-arm having a free end; a lever pivotally mounted upon the free end of said arm; means for oscillating said lever; a link connecting said lever with said presser-foot carrying bar; a second link connecting said lever with said feeding-foot carrying bar; and spring means effective for yieldingly urging said presser-foot carrying bar and said feeding-foot carrying bar toward said work-support.

2. In combination, in a sewing machine having a frame including a work-support; a reciprocatory presser-foot carrying bar; a feeding-foot carrying bar mounted for endwise reciprocatory and laterally vibratory work-feeding movements; an oscillatory lever; a freely turnable fulcrum-arm pivotally supporting said oscillatory lever and providing a floating fulcrum therefor; means for oscillating said lever; means for connecting said oscillatory lever to said presser-foot carrying bar and to said feeding-foot carrying bar; and spring means acting upon said oscillatory lever for yieldingly urging said presser-foot carrying bar and said feeding-foot carrying bar toward said work-support.

3. In combination, in a sewing machine having a frame including a work-support and a bracket-arm; a reciprocatory presser-foot carrying bar journaled in said bracket-arm; a vibratory frame pivoted upon said bracket-arm; an endwise reciprocatory needle-bar journaled in said vibratory frame; a feeding-foot carrying bar also journaled in said vibratory frame; means for alternately raising and lowering said presser-foot carrying bar and said feeding-foot carrying bar including an oscillatable lever; means providing a floating fulcrum independent of said presser-foot carrying bar for said oscillatable lever; and means for yieldingly urging said presser-foot carrying bar and said feeding-foot carrying bar toward said work-support.

4. In combination, in a sewing machine having a frame including a work-support; a reciprocatory presser-foot carrying bar; a feeding foot carrying bar mounted for endwise reciprocatory and laterally vibratory work-feeding movements; a plural-armed lever; means for oscillating said plural-armed lever; a freely turnable fulcrum-arm pivotally supporting said plural-armed lever at the junction of its arms and providing a floating fulcrum therefor; a link connecting one of the arms of said lever with said presser-foot carrying bar; a second link connecting another of the arms of said lever with said feeding-foot carrying bar; and a spring adapted to apply a downward pressure upon said plural-armed lever at substantially the junction of its arms for yieldingly urging said presser-foot carrying bar and said feeding-foot carrying bar toward said work-support.

5. The combination in a sewing machine having a frame including a work-support; a reciprocatory presser-foot carrying bar; a feeding-foot carrying bar mounted for endwise reciprocatory and laterally vibratory work-feeding movements; an oscillatory lever; means independent of said preser-foot carrying bar for pivotally supporting said lever; means for oscillating said lever about its supporting pivot; a link connecting said lever with said presser-foot carrying bar; a second link connecting said lever with said feeding-foot carrying bar; and spring means effective to yieldingly urge said presser-foot carrying bar and said feeding-foot carrying bar toward said work-support.

6. The combination in a sewing machine having a frame including a work-support and a bracket-arm; a reciprocatory presser-foot carrying bar; a feeding-foot carrying bar mounted for endwise reciprocatory and laterally vibratory work-feeding movements; a rock-shaft journaled in said bracket-arm; means for actuating said rock-shaft; a fulcrum-arm freely journaled upon said rock-shaft and pivotally supporting at its free end an oscillatory lever; means for actuating said oscillatory lever about its supporting pivot; means connecting said oscillatory lever with the respective upper ends of the presser-foot carrying bar and the feeding-foot carrying bar; and spring means effective to yieldingly bias said presser-foot carrying bar and said feeding-foot carrying bar toward said work-support.

7. The combination in a sewing machine having a frame including a work-support and a bracket-arm; an actuating shaft journaled in said bracket-arm; a reciprocatory presser-foot carrying bar; a feeding-foot carrying bar mounted for endwise reciprocatory and laterally vibratory work-feeding movements; a feed-advance rock-shaft journaled in said bracket-arm and actuated by an eccentric on said actuating shaft; means operatively connecting said feed-advance rock-shaft to vibrate laterally the feeding-foot carrying bar; a fulcrum-arm freely journaled on said feed-advance rock-shaft and pivotally supporting at its free end an oscillatory lever; means for actuating said oscillatory lever about its supporting pivot; means connecting said oscillatory lever with the respective upper ends of the presser-foot carrying bar and the feeding-foot carrying bar; and spring means effective to yieldingly bias said presser-foot carrying bar and said feeding-foot carrying bar toward said work-support.

8. In a sewing machine, the combination with a frame including a work-support and a bracket-arm; an actuating shaft journaled in said bracket-arm; a feed-advance rock-shaft journaled in said bracket-arm at one side of the vertical plane containing the longitudinal axis of said actuating shaft and operated by an eccentric on said last mentioned shaft; an endwise reciprocatory presser-foot carrying bar; an endwise reciprocatory and a laterally vibratory feeding-foot carrying bar; means operatively connecting said feed-advance rock-shaft to vibrate said feeding-foot carrying bar in the line of feed; a fulcrum-arm freely journaled upon said feed-advance rock-shaft and pivotally supporting at its free end an oscillatory lever; a feed-lift rock-shaft spaced from said feed-advance rock-shaft and operated by a second eccentric on said actuating-shaft; means connecting said feed-lift rock-shaft to turn said oscillatory lever about its supporting pivot; links connecting said oscillatory lever to the respective upper ends of the

presser-foot carrying bar and the feeding-foot carrying bar; and a spring effective to yieldingly bias said presser-foot carrying bar and said feeding-foot carrying bar toward said work-support.

9. A sewing machine having, in combination, a frame including a work-support and an overhanging bracket-arm; a reciprocatory presser-foot carrying bar journaled in said bracket-arm; a vibratory frame pivotally hung at its upper end upon said bracket-arm; a needle-bar and a feeding-foot carrying bar each journaled for endwise reciprocatory movements in said vibratory frame, and each spaced a substantially equal distance from a vertical plane passing through the point of pivotal support of said vibratory frame; means for actuating said vibratory frame in the line of feed; means for alternately raising and lowering said presser-foot carrying bar and said feeding-foot carrying bar including an oscillatable lever; means including a freely fulcrumed arm providing a floating fulcrum for said oscillatable lever; and spring means engaging said freely fulcrumed arm for yieldingly urging said presser-foot carrying bar and said feeding-foot carrying bar toward said work-support.

10. A sewing machine having, in combination, a frame including a work-support and an overhanging head provided with a clearance opening therein; a reciprocatory presser-foot carrying bar; a feeding-foot carrying bar mounted for endwise reciprocatory and laterally vibratory work-feeding movements; an oscillatory lever disposed above the upper ends of said presser-foot carrying bar and said feeding-foot carrying bar; a freely turnable fulcrum-arm pivotally supporting said oscillatory lever and providing a floating fulcrum therefor; means for oscillating said lever; links for connecting said oscillatory lever to said presser-foot carrying bar and to said feeding-foot carrying bar; and a leaf-spring extending through the clearance opening in said overhanging head and acting upon said oscillatory lever for yieldingly urging said presser-foot carrying bar and said feeding-foot carrying bar toward said work-support.

11. The combination in a sewing machine having a frame including a work-support and a bracket-arm terminating in a head; a reciprocatory presser-foot carrying bar; a feeding-foot carrying bar mounted for endwise reciprocatory and laterally vibratory work-feeding movements; a substantially horizontally disposed fulcrum-arm pivotally sustained by said bracket-arm-head; an oscillatable lever journaled for turning movements on said horizontally disposed fulcrum-arm; means for oscillating said lever; means connecting said lever with said presser-foot carrying bar and with said feeding-foot carrying bar; and spring means effective for yieldingly urging said presser-foot carrying bar and said feeding-foot carrying bar towards said work-support.

12. The combination in a sewing machine having a frame including a work-support and a bracket-arm; a reciprocatory presser-foot carrying bar; a feeding-foot carrying bar supported for endwise reciprocatory and laterally vibratory work-feeding movements; an oscillatable lever; means independent of said presser-foot carrying bar for providing a floating fulcrum for said lever about which the latter is oscillated; means for oscillating said lever; means connecting said oscillatable lever to said presser-foot carrying bar and to said feeding-foot carrying bar; and spring means for yieldingly biasing said feeding-foot carrying bar and said presser-foot carrying bar toward said work-support.

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