

July 2, 1935.

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2,007,139

FEEDING MECHANISM FOR SEWING MACHINES

Filed Dec. 8, 1932

2 Sheets-Sheet 1

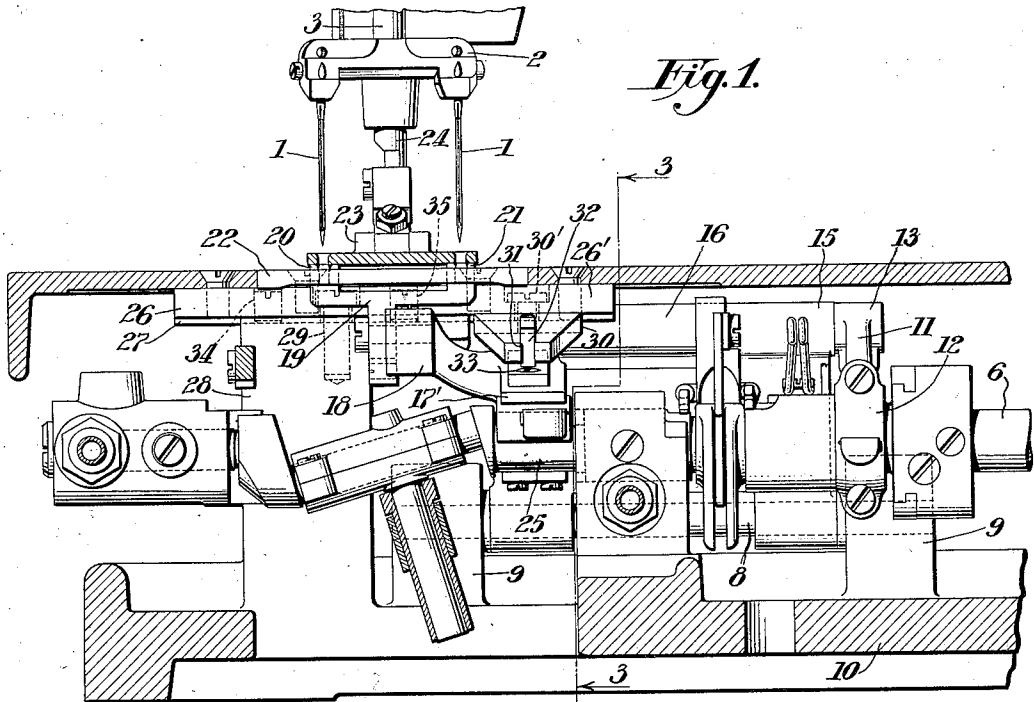


Fig. 1.

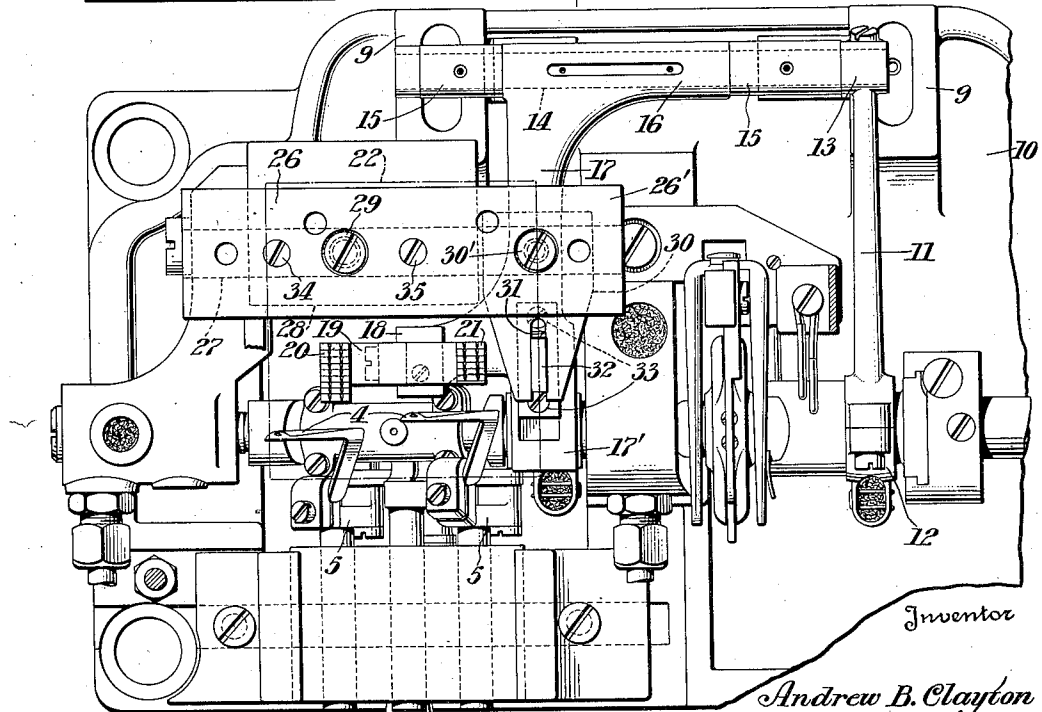
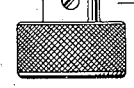


Fig. 2.

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2 Sheets—Sheet 2

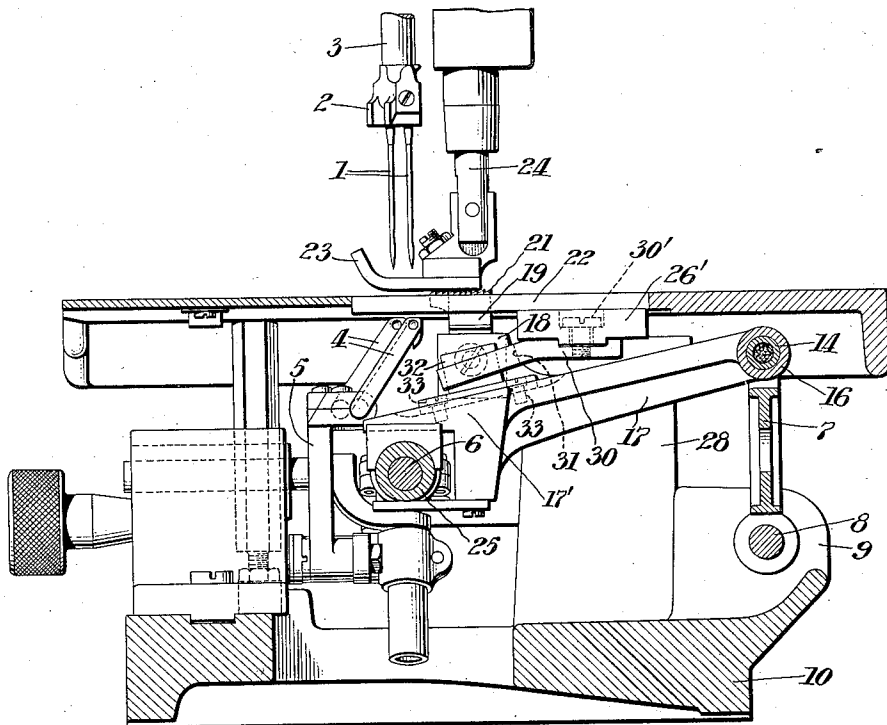


Fig. 3.

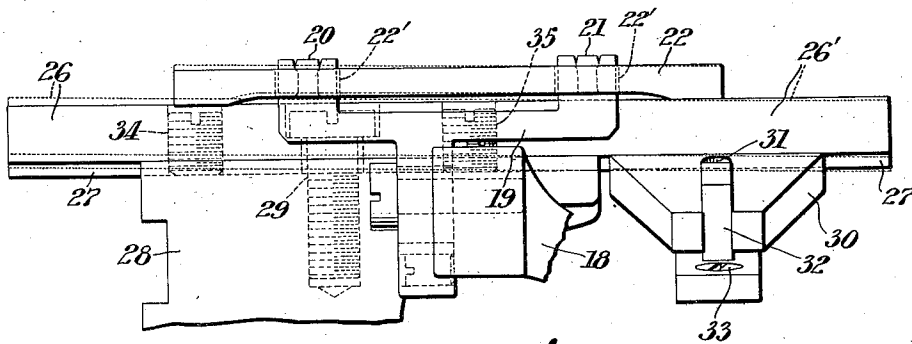


Fig. 4.

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UNITED STATES PATENT OFFICE

2,007,139

FEEDING MECHANISM FOR SEWING MACHINES

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Application December 8, 1932, Serial No. 646,255

5 Claims. (Cl. 112—210)

This invention relates to sewing machines and more particularly to the work-advancing mechanism therefor commonly known as the "feeding mechanism".

5 One of the objects of this invention is to provide improved means whereby the feeding action of the feed-dog may be adjusted so as to feed the work in a true right line.

10 Another object of this invention is to provide improved means for causing the feed-dog to operate in a true vertical plane.

15 With the above and other objects in view, as will hereinafter appear, the invention consists in the devices, combinations, and arrangements of parts hereinafter set forth and illustrated in the accompanying drawings of a preferred embodiment of the invention, from which the several features of the invention and the advantages attained thereby will be readily understood by those skilled in the art.

20 Figure 1 is a front elevation, partly in section, of a sewing machine having my improved feeding mechanism embodied therein.

25 Figure 2 is a plan view of a machine with the cloth-plate removed showing as much of the mechanism as is necessary to illustrate the application of my improved feeding mechanism thereto.

30 Figure 3 is a sectional view taken substantially along the line 3—3 of Figure 1.

Figure 4 is an enlarged detail view.

35 In the drawings I have shown my improved feeding mechanism applied to a two needle double chain-stitch machine, known commercially as the "Singer" 152 class machine. This machine makes two independent seams, the needles, indicated at 1, being secured in laterally spaced relationship within a clamp 2 carried by the needle-bar 3 which is actuated in the well known manner.

40 Cooperating with the needles 1 are thread-carrying loopers 4 fixed in looper-carriers 5 which are actuated by the main shaft 6 of the machine. The loopers 4 may be actuated in any well known manner, for instance, by the mechanism disclosed in the patents to De Voe, No. 1,100,124, of June 16, 1914, and Clayton, No. 1,569,912, of Jan. 19, 1926, or the mechanism shown and described in my copending application Serial No. 577,919, filed Nov. 30, 1931.

45 In the present embodiment the work-advancing or feeding mechanism includes a rocking frame 7 (Fig. 3) fulcrumed on a fixed pin 8 which is journaled in bosses 9 on the machine-frame 10. An oscillatory movement is imparted to the rocking-frame 7 by a pitman 11 having one of its ends

embracing an adjustable eccentric 12 carried by the main shaft 6 and its other end pivotally connected by the split hub 13 to the pivot-pin 14 which is journaled in the upstanding arms 15 of the rocking frame.

5 Disposed intermediate the arms 15 of the feed-rocker and carried by the pivot-pin 14 is the enlarged apertured end 16 of the feed-bar 17 having its forward end 17' embracing the usual feed-lift eccentric 25 on the main shaft. The 10 feed-bar 17 is formed with a laterally extending arm 18 to which is detachably and adjustably secured the feed-dog 19 formed with laterally spaced serrated work-engaging sections 20 and 21. The work-engaging sections 20 and 21 of 15 the feed-dog extend through slots 22' in the throat-plate 22 and cooperate with a presser-foot 23 having a flat sole-portion provided with suitable needle-apertures, the presser-foot 23 being carried by the usual presser-bar 24.

20 The throat-plate 22 is secured to a cross-bar 26 having a longitudinal rib 27 on its lower face, the cross-bar being adjustably secured by the cap-screw 29 to the fixed standard 28 rising from the bed-plate 10 of the machine frame.

25 When sewing machines having the feed-dog offset relative to or at one side of the feed-bar are operated at high speeds, it has been found that the feed-dog does not travel in a true vertical plane. In overcoming this and to insure that 30 the feed-dog will execute its four motion movement in a true vertical plane I have extended one end 26' of the cross-bar so that it overhangs the feed-bar 17, and to the end 26' I have adjustably secured by the screw 30' a guide-member 30 35 having its forwardly extending end bifurcated to form a guide-slot 31 which slidably receives a tongue 32 rigidly fixed to the feed-bar 17 by the screws 33.

40 The member 30 is recessed to receive the longitudinal rib 27 on the lower face of the cross-bar 26 and it will be observed that the screw 30' is received by an aperture of larger diameter than the screw (Figures 1 and 3) thereby permitting the member 30 to be shifted or adjusted sidewise 45 along the rib 27. The purpose of this adjustment is to provide means whereby the feed-dog 19 carried by the feed-bar 17 may be adjusted in order that the work-engaging sections 20 and 21 may be centralized in the slots 22' of the 50 throat-plate 22.

55 Feed-dogs offset from the feed-bar and having a plurality of laterally spaced work-engaging sections in some cases have a tendency to advance the work in a curved line instead of a right line, 55

due to the fact that one of the work-engaging sections has a tendency to spring more than the other when it comes in contact with the work and acts against the spring-pressed presser-foot, with the result that this section remains in engagement with the work a shorter time than the other section, thereby advancing that portion of the work a shorter distance. To overcome this tendency I have provided the cross-bar 26 which supports the throat-plate 22 with adjustable means whereby the cross-bar and throat-plate may be adjusted about a horizontal axis extending in the direction of the line of seam formation. As shown in the drawings this adjustable means comprises set-screws 34 and 35 disposed on opposite sides of the screw 29. It will be observed that the screw 29 is located in rear and adjacent the feed-dog 19. This location of the screw 29 permits the throat-plate to be adjusted about an axis extending in the direction of the line of seam formation and in the zone of action of the feed-dog with the result that the throat-plate may be adjusted to different angular positions relative to the feed-dog without materially varying its average height above the feed-dog. The phrase zone of action of the feed-dog meaning the zone contained between vertical planes extending in the direction of the line of seam formation and passing through the serrated work-engaging surfaces 20 and 21 of the feed-dog. As is well known in sewing machines in which the feed-dog has four motions, the vertical components of motion are compounded with the horizontal components of motion thereby causing the feed-dog to describe an ellipse in a vertical plane. Consequently when feed-dogs having a plurality of laterally spaced work-engaging portions are used it is essential that all of the work-engaging portions engage the work simultaneously during the work-advancing movement of the feed-dog, or in other words that all of the work-engaging portions extend the same distance above the throat-plate during the work-advancing movement in order that work may be advanced in a right line. As clearly shown in Figure 4, the cross-bar 26 may be adjusted by loosening the screw 29 and adjusting the set screws 34 or 35 until the work-engaging sections 20 and 21 extend the same distance above the throat-plate 22, it being understood that the throat-plate is rigidly fixed to the cross-bar 26.

It will be obvious that if it is desired to sew in a curved path the throat-plate may be adjusted accordingly.

From the foregoing description considered in connection with the accompanying drawings, the construction, manner of operation and several advantages of my improved feeding mechanism will be clearly and fully understood. It is apparent that such devices have a wide variety of uses, and that the form, construction and arrangement of the several elements employed may be varied. Therefore, the privilege is reserved of resorting to all such legitimate changes therein as may be fairly embodied within the spirit and scope of the appended claims.

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

1. A sewing machine having a plurality of needles laterally spaced apart, loop-taking means cooperating therewith, a feed-bar, a feed-dog carried thereby, means for imparting horizontal and vertical components of motion to said feed-bar, a presser-foot cooperating with said feed-dog for advancing the work, a cross-bar secured to the frame of the machine, a guide-member adjustably secured to said cross-bar, a member fixed to said feed-bar and cooperating with said guide-member to insure the true vertical movement of said feed-bar, a throat-plate having slots through which said feed-dog operates and means whereby the throat-plate may be inclined about a horizontal axis extending substantially in the direction of the line of seam formation.

2. In combination, a sewing machine having stitch-forming mechanism, feeding mechanism including a feed-dog having work-engaging sections and a presser-foot cooperating therewith, a throat-plate through which the work-engaging sections of the feed-dog extend during its work-advancing movement, said throat-plate being movable about an axis intermediate its ends and extending in the direction of the line of seam formation and adjusting means located on opposite sides of the axis whereby said throat-plate may be adjusted to different angular positions relative to said feed-dog.

3. A sewing machine having a frame, a plurality of needles laterally spaced apart, loop taking means cooperating therewith, a feed-dog, means for imparting to said feed-dog vertical and horizontal components of motion, a cross-bar, means intermediate the ends of said cross-bar for securing said cross-bar to said frame, adjustable means located on opposite sides of said last named means for adjusting said cross-bar to different angular positions relative to the feed-dog, and a throat-plate through which said feed-dog operates fixed to said cross-bar.

4. A sewing machine having sewing instrumentalities and feeding mechanism including a feed-dog formed with laterally spaced work-engaging elements, a throat-plate through which said feed-dog extends during its work-advancing movement, and means for adjusting said throat-plate about an axis located within the zone of action of the feed-dog and extending in the direction of the line of seam formation.

5. A sewing machine having sewing instrumentalities and feeding mechanism including a feed-dog formed with laterally spaced work-engaging elements, a throat-plate through which said feed-dog extends during its work-advancing movement, means for adjusting said throat-plate about an axis located within the zone of action of the feed-dog and extending in the direction of the line of seam formation, and a plurality of laterally spaced adjusting devices for the throat-plate and adjustable independently of one another to secure any desired working elevation of the throat-plate and any desired lateral tilt within the limits provided.

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