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2,306,262

SEWING MACHINE FEEDING MECHANISM

Filed Sept. 17, 1941

4 Sheets-Sheet 1

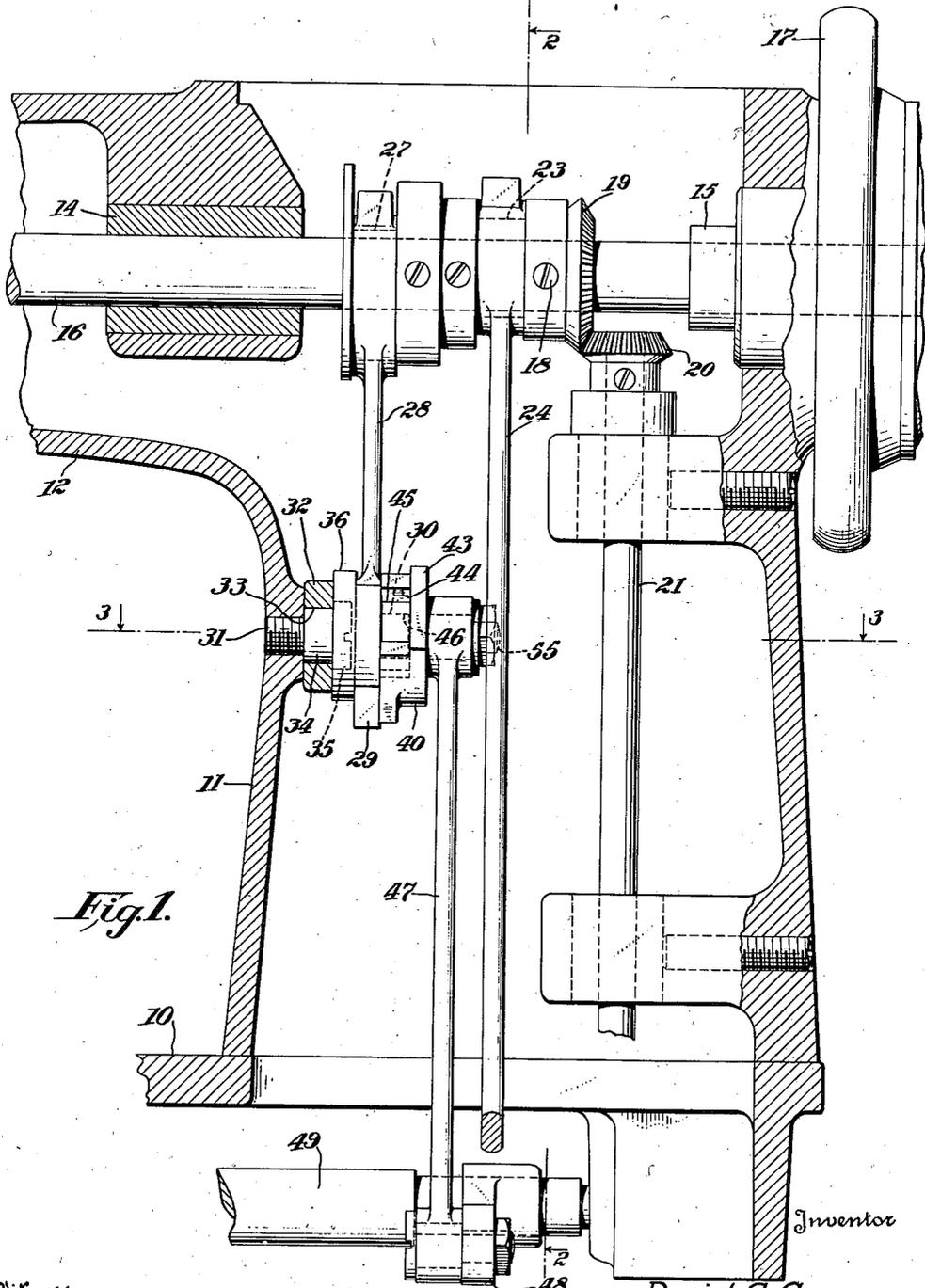


Fig. 1.

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4 Sheets-Sheet 3

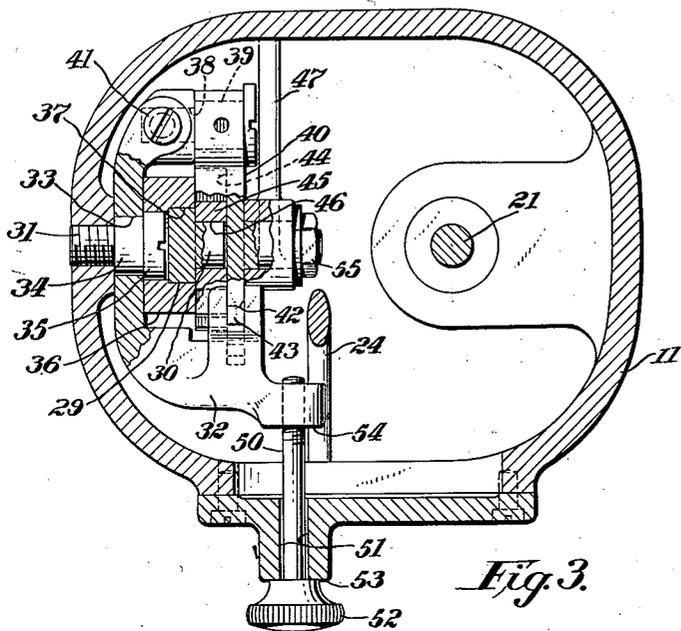


Fig. 3.

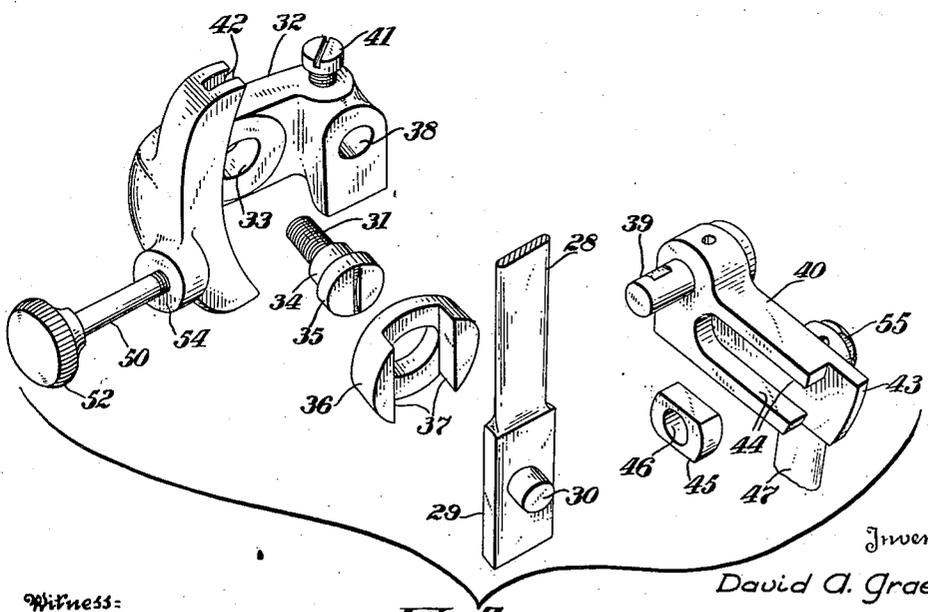


Fig. 4.

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4 Sheets-Sheet 4

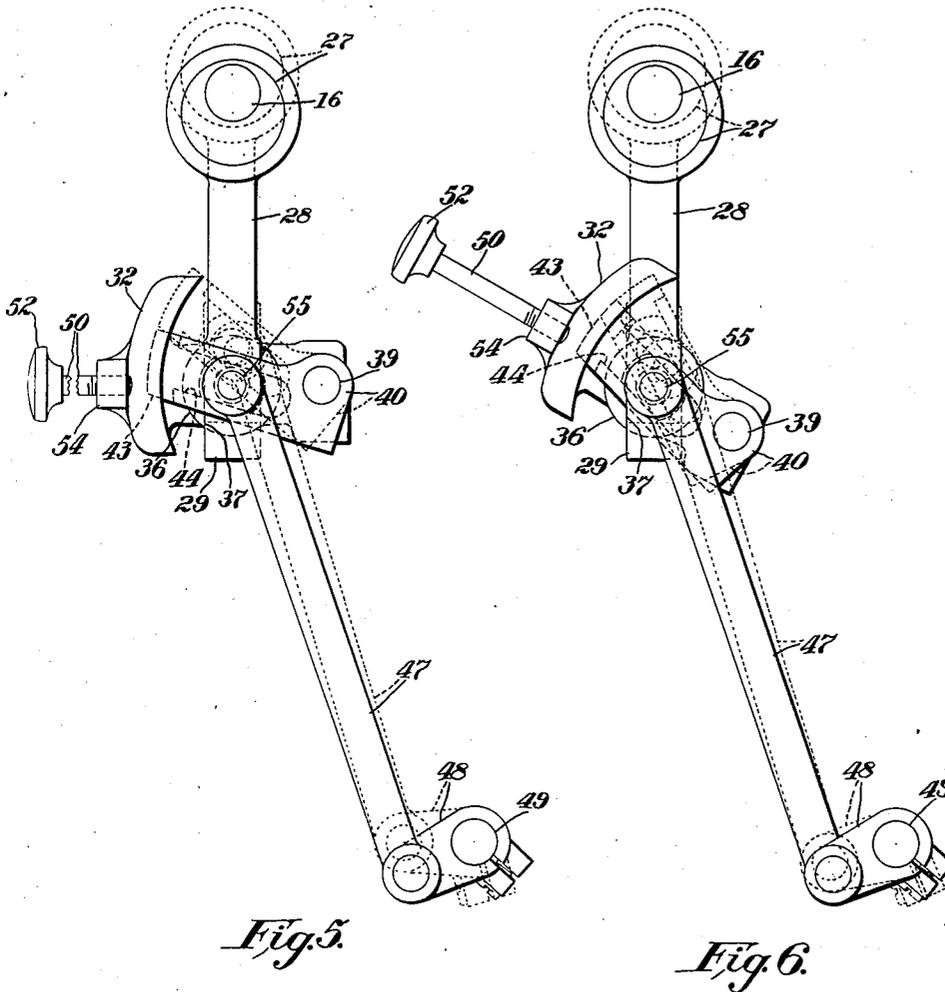


Fig. 5.

Fig. 6.

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SEWING MACHINE FEEDING MECHANISM

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8 Claims. (Cl. 112—210)

This invention relates to feed-actuating mechanisms for sewing machines and more particularly to that type of feed-actuating mechanism in which the feed length is adjustable.

One of the objects of this invention is to provide an improved high-speed feed-actuating mechanism that is adjustable as regards its length of feed and which will advance the feeding mechanism from the same starting point throughout all of stitch-length adjustments thereof.

The novel and characteristic features of this invention are set forth particularly in the appended claims. The invention itself, however, both in structure and in operation, as well as additional objects thereof, will be best understood from the following description:

Fig. 1 is a vertical section taken through the center of a sewing machine embodying the present invention. This figure shows the position of the mechanism when the feed advance and return eccentric is at the bottom of its throw.

Fig. 2 is a vertical section taken substantially along the line 2—2 of Fig. 1 and showing, in full lines, the mechanism with the feed advance and return eccentric in its top position, and in dotted lines, the mechanism with the eccentric in its lowest position.

Fig. 3 is a horizontal section taken substantially along line 3—3 of Fig. 1 and showing the mechanism as positioned with the feed advance and return eccentric in its lowest position.

Fig. 4 is a disassembled perspective view of a portion of the feeding mechanism.

Figs. 5 and 6 are diagrammatic illustrations of the movements of the feed-actuating mechanism for the different set positions.

In the embodiment of the invention selected for illustration 10 represents the work-support or bed of the machine which carries the upright standard 11 and overhanging bracket-arm 12. Journalled in the bearings 14 and 15 carried by the bracket-arm 12 is a needle-bar actuating shaft 16 having the usual driving pulley wheel 17 fixed to one of its ends. To the other end of the shaft 16 there is fixed, but not herein shown, the usual crank and link mechanisms for driving the needle-bar and take-up elements. For more detailed information concerning the present type of machine, reference may be had to Patent No. 2,161,579 to Kaier, dated June 6, 1939.

Fixed to the shaft 16 by means of screw 18 is a gear 19 which meshes with a gear 20 carried by the top portion of a vertical shaft 21. The lower end-portion of this vertical shaft 21 is

operatively connected (but not herein shown) to the usual loop-taker actuating shaft 22 which is suitably journaled beneath the work-support 10.

The shaft 16 carries a feed-lift eccentric 23 which actuates a pitman 24 having its lower end pivotally connected to an arm 25 fixed to the usual feed-lift rock-shaft 26 for the purpose of imparting a rising and falling movement to the usual feed-bar operatively connected to an end thereof but not herein shown. Reference may be had to Patent No. 1,146,406 to Diehl and Hemleb, dated July 13, 1915, for more detailed information concerning the present type of feed-bar mechanism.

A feed-advance eccentric 27 is also carried by the shaft 16, and this eccentric actuates a pitman 28 the lower end portion 29 of which is substantially rectangular in cross-section and has a pin 30 fixed thereto.

Screwed into the forward wall of the upright standard 17 is a shouldered stud 31. Pivotally mounted upon this stud 31 is a yoke 32 having an aperture 33 the wall of which bears upon the cylindrical portion 34 of the stud 31. The cylindrical head portion 35 of the stud 31 functions as a pivotal bearing upon which an apertured guide-block 36 is mounted in tandem relation with said yoke 32. A guide slot 37 is provided in the block 36 for the purpose of slidably receiving the rectangular end portion 29 of the pitman 28. From the above description it will be understood that the pitman 28 has a fixed path and amplitude of movement at all times.

One end of the yoke 32 is provided with an aperture 38 adapted to receive one end of a headed stub-shaft 39 upon which an arm 40 is pivotally mounted. A set-screw 41 secures the stub-shaft 39 within the aperture 38. The other end of the yoke 32 is provided with an arcuately shaped groove 42 which is adapted to slidably receive the tongue portion 43 of the arm 40. A groove 44 provided in the arm 40 slidably receives therein a slide-block 45 having an aperture 46 into which the pin 30 of the pitman 28 extends. With particular reference to Fig. 3, it will be understood that the arm 40, being connected at both of its ends to the yoke 32, functions as a thrust or cover member to hold the block 36, the pitman portion 29, and the slide-block 45 in their proper relative positions axially of the stud 31. It will also be understood that vertical movements of the pin 30 will oscillate the arm 40 about its pivotal axis which is the stub-shaft 39.

Pivotally secured to the arm 40 by means of

a screw and nut connection 55 is a link 47 the lower end of which is, in turn, pivotally connected to a feed-rocker arm 48 mounted on the usual feed advance and return rock-shaft 49. The oscillating movements of the arm 40 are transmitted by means of link 47 and arm 49 to the rock-shaft 49 which in turn actuates the usual feed-bar, not shown, by imparting thereto the feed advance and return movements.

In one end of the yoke 32 a rod 50 is tapped, as at point 54, and this rod extends through an opening 51 provided in the side wall of the upright standard 11. By means of this rod 50 the yoke 32 may be adjusted about its pivotal axis, the stud 31, to thereby arcuately shift the stub-shaft 39 which forms the pivotal axis for the arm 40. It will be understood, with particular reference to Figs. 5 and 6, that the more nearly at right angles the pitman pin 30 imparts its motion to the grooved arm 40, the greater arc will be described by the latter about its pivotal axis, the stub-shaft 39, and a greater throw will be imparted to the link 47 and consequently to the feed rock-shaft 49 and the usual feed-bar.

Referring to Figs. 1 and 3, which illustrate the feeding mechanism with the feed-advance eccentric 27 at its lowest position, it will be seen that the pivot stud 31, the pitman pin 30, and the upper pivotal point of the link 47 are all pivotally mounted about a common instantaneous horizontal axis which is coaxial with the normal axis of the stud 31. When the mechanism is thus positioned the rock-arm 48 is at its lowest point and therefore, the feed-bar, and consequently the feed-dog, may be considered to be at their extreme return positions. From the present construction therefore, it will be obvious that any adjustment of the yoke 32 will not affect this position of the mechanism but will merely lengthen or shorten the throw thereof when the feed-advance eccentric 27 is at its highest position as illustrated by the solid lines of Fig. 2. The feed rock-shaft 49, and consequently the feed-dog, will always start on their feed advance movements from the same return position, as illustrated by the solid lines of Figs. 5 and 6.

Figs. 5 and 6 illustrate, in solid lines the present mechanism with the feed-advance eccentric 27 at its lowest point, and in dotted lines the mechanism when the eccentric is at its top position. Fig. 5 further illustrates the mechanism adjusted to give the maximum feed-stroke, and Fig. 6 illustrates the same as adjusted for the minimum feed-stroke.

In the present embodiment of the invention, the adjusting rod 50 has at its free end an integral finger-piece 52 which bears against the arcuately shaped face 53 of the opening 51. To adjust the yoke 32 the operator need only grasp the finger piece 52 and raise or lower the same. The yoke 32 may be locked in any adjusted position by turning the finger piece 52 and thus forcing it up against the face 53. Proper indicia may be provided along the face 53 to indicate the various stitch lengths which may be obtained by the above described adjustments.

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

1. Feeding mechanism for sewing machines having, in combination, a feed rock-shaft, an arm on said rock-shaft, a rotary shaft, an eccentric carried by said rotary shaft, a pitman actuated by said eccentric and having a fixed path of motion at all times, an arm operatively connected to said pitman and oscillated thereby about a

pivotal axis disposed parallel to said rotary shaft, means to arcuately shift the pivotal axis of said arm, and a link connecting said oscillating arm to said arm on said feed rock-shaft.

2. Feeding mechanism for sewing machines having, in combination, a feed rock-shaft, a rotating shaft, an eccentric carried by said rotating shaft, a pitman actuated by said eccentric, a stub-shaft disposed parallel to said rotating shaft, an arm pivotally secured to said stub-shaft, a sliding connection between said pitman and said arm, means to shift said stub-shaft in an arcuate path, and a link connecting said arm to said feed rock-shaft.

3. An adjustable throw feeding mechanism for sewing machines having, in combination, a feed rock-shaft, a rotating shaft, an eccentric carried by said rotating shaft, a pitman actuated by said eccentric and having a fixed path of motion at all times, a stub-shaft disposed parallel to said rotating shaft, a grooved arm pivotally secured to said stub-shaft, a sliding connection between said pitman and the groove in said arm, manually adjustable means including a pivotal yoke for shifting said stub-shaft in an arcuate path, and a link connecting said grooved arm to said feed rock-shaft.

4. Feeding mechanism for sewing machines having, in combination, a feed rock-shaft, a rotating shaft, an eccentric carried by said rotating shaft, a pitman actuated by said eccentric, a block provided with a slot and pivotally mounted upon a fixed axis, said block slidably receiving the free end portion of said pitman, a stub-shaft disposed parallel to said rotating shaft, an arm pivotally secured to said stub-shaft, said arm operatively connected to the end of the pitman remote from said eccentric, means to shift said stub-shaft in an arcuate path, and a link connecting said arm to said feed rock-shaft.

5. An adjustable stitch-length feeding mechanism for sewing machines having, in combination, a feed rock-shaft, a rotating shaft, an eccentric carried by said rotating shaft, a pitman actuated by said eccentric, a yoke having a fixed pivotal axis, a stub-shaft carried by one end of said yoke and disposed in parallel relation with said rotating shaft, an arm pivotally mounted upon said stub-shaft, said arm slidably connected to the end of the pitman remote from said eccentric, manually operable means to turn said yoke about its pivotal axis, and a link connecting said arm to said feed rock-shaft.

6. Feeding mechanism for sewing machines having, in combination, a feed rock-shaft, a rotating shaft, an eccentric carried by said rotating shaft, a pitman actuated by said eccentric, a pin carried by the free end-portion of said pitman, a fixed stud disposed in parallel relation with said rotating shaft, a block provided with a slot and pivotally mounted upon said stud, said block receiving and guiding the free end portion of said pitman, a stub-shaft disposed parallel to said rotating shaft, a grooved arm pivotally secured to said stub-shaft and receiving said pitman-pin, manually operable means to shift said stub-shaft in an arcuate path, and a link connecting said grooved arm to said feed rock-shaft.

7. Feeding mechanism for sewing machines having, in combination, a feed rock-shaft, a rotating shaft, an eccentric carried by said rotating shaft, a pitman actuated by said eccentric, a pin carried by the end of said pitman remote from said eccentric, a fixed stud disposed in parallel relation with said rotating shaft, a

block provided with a slot and pivotally mounted upon said stud, said block slidingly receiving the pin-carrying end of said pitman, a yoke pivotally mounted upon said stud, a stub-shaft carried by one end of said yoke, a grooved arm pivotally mounted upon said stub-shaft and receiving said pitman-pin in the groove thereof, manually operable means to adjust said yoke about said stud, and a link connecting said grooved arm to said feed rock-shaft.

8. Feeding mechanism for sewing machines having in combination a feed rock-shaft, a rotating shaft, an eccentric carried by said rotating shaft, a pitman actuated by said eccentric, a pin carried by the end of the pitman remote from said eccentric, a fixed stud disposed in parallel

relation with said rotating shaft, a block provided with a slot and pivotally mounted upon said stud, said block slidingly receiving the pin-carrying end of said pitman, a yoke pivotally mounted intermediate its ends upon said stud and having an arcuately shaped groove formed in one end portion thereof, a stub-shaft carried by the other end of said yoke, a grooved arm pivotally mounted upon said stub-shaft and receiving said pitman-pin in the groove thereof, a tongue carried by the free end of said grooved arm, said tongue slidingly received by said yoke groove, manually operable means to adjust said yoke about said stud, and a link connecting said grooved arm to said feed rock-shaft.

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