

June 6, 1939.

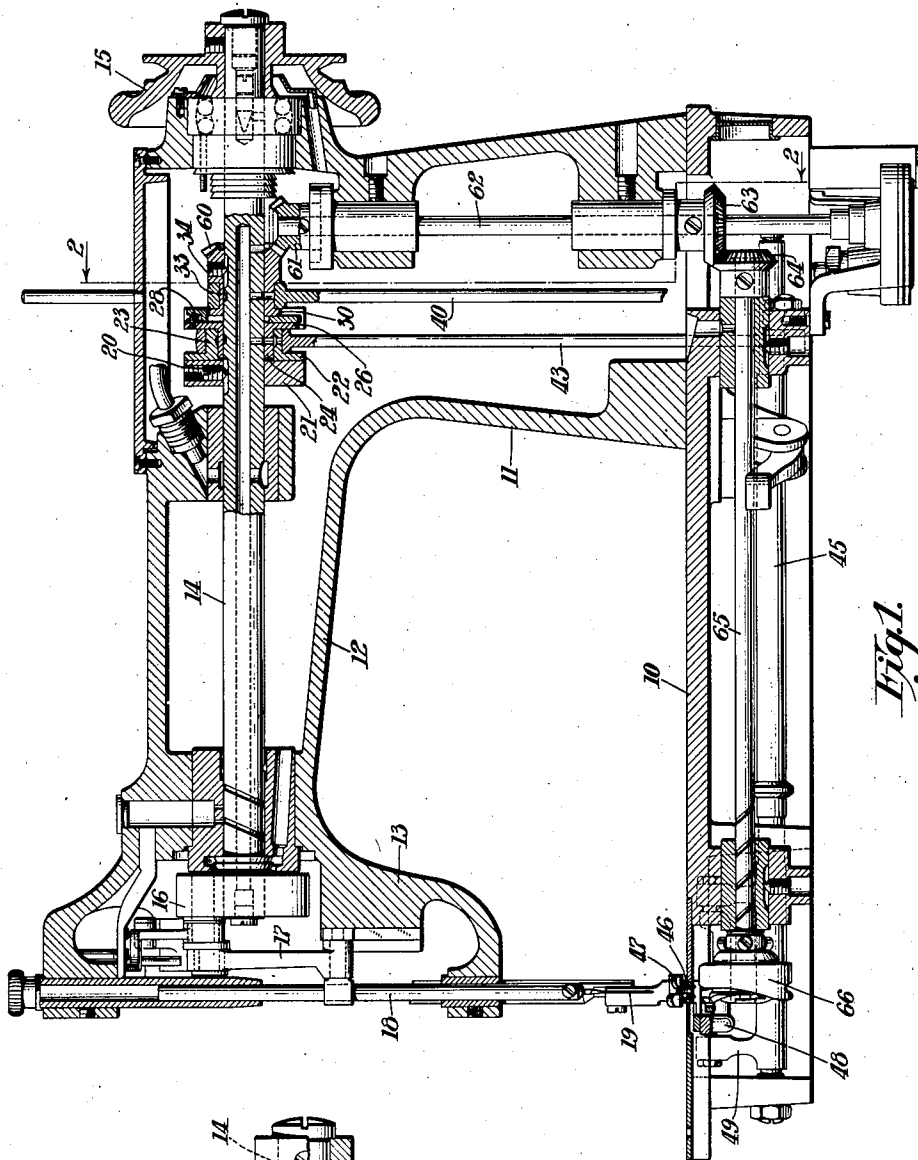
R. KAIER

2,161,579

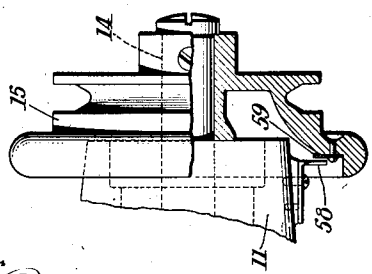
ADJUSTABLE ECCENTRIC FOR SEWING MACHINES

Filed April 23, 1938

2 Sheets-Sheet 1



*Fig. 1.*



*Fig. 1a.*

Inventor  
*Richard Kaier*

Witness:  
*Gregory Pecina*

334

*Henry J. Miller*  
Attorneys

June 6, 1939.

R. KAIER

2,161,579

ADJUSTABLE ECCENTRIC FOR SEWING MACHINES

Filed April 23, 1938

2 Sheets-Sheet 2

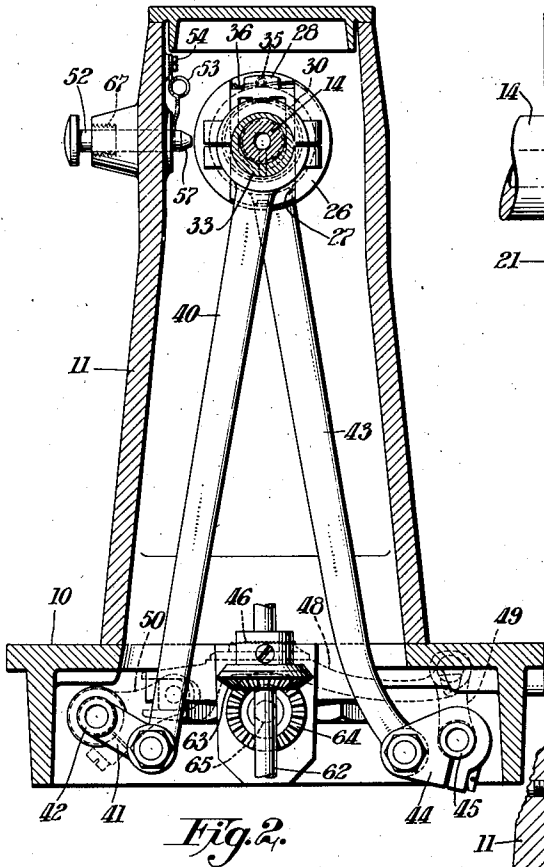


Fig. 2.

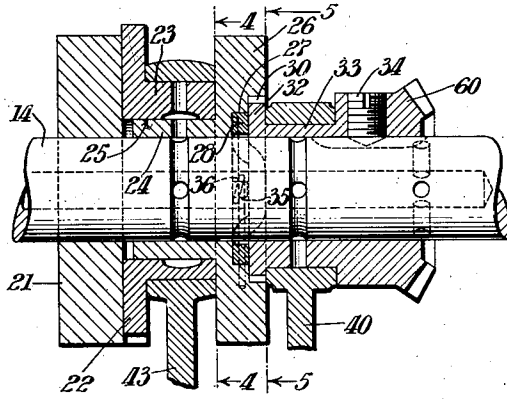


Fig. 3.

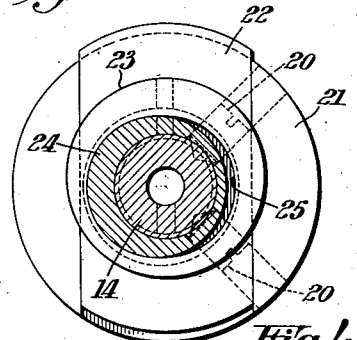


Fig. 4.

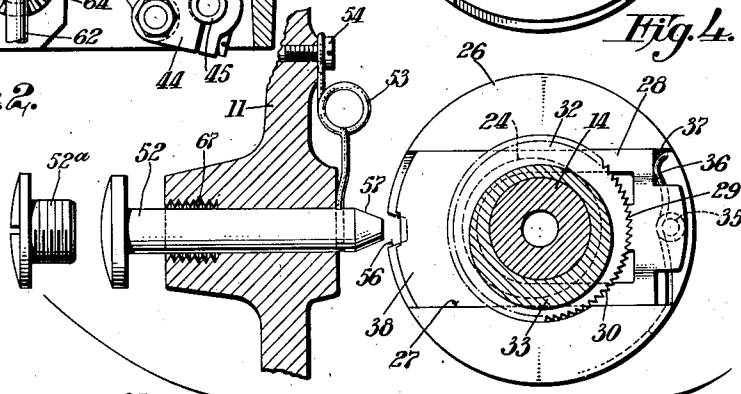


Fig. 5.

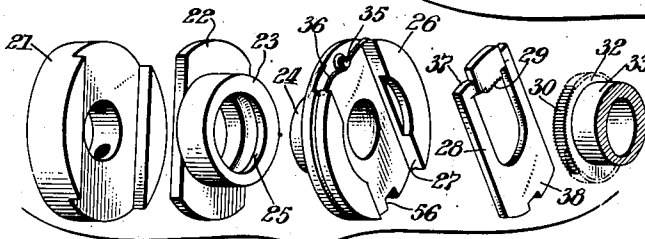


Fig. 6.

Inventor

Richard Kaier

Witness:  
Joseph Peiner

By Henry J. Miller  
Attorney

# UNITED STATES PATENT OFFICE

2,161,579

## ADJUSTABLE ECCENTRIC FOR SEWING MACHINES

Richard Kafer, Cranford, N. J., assignor to The Singer Manufacturing Company, Elizabeth, N. J., a corporation of New Jersey

Application April 23, 1938, Serial No. 203,728

7 Claims. (Cl. 112—210)

This invention relates to an eccentric for use with a sewing machine and more particularly to a feed actuating eccentric which may be adjusted to vary its eccentricity.

5 The primary object of this invention is to provide an improved high speed actuating eccentric which is readily adjustable and which is positively locked in its adjusted position.

10 With the above and more specific objects in view, the invention comprises the devices, combinations, and arrangements of parts hereinafter described in connection with the accompanying drawings from which the several features of the invention and the advantages attained thereby  
15 will be readily understood by those skilled in the art.

In the drawings:—

Fig. 1 is a vertical section taken through the center of a machine having my invention embodied therein.

20 Fig. 1<sup>a</sup> is a fragmentary view showing the stitch length indicator.

Fig. 2 is a vertical section taken substantially along the line 2—2 of Fig. 1.

25 Fig. 3 is an enlarged sectional view through the feeding eccentrics.

Figs. 4 and 5 are sectional views taken along the lines 4—4 and 5—5 of Fig. 3.

30 Fig. 6 is a disassembled perspective view of the adjustable eccentric.

Referring to the drawings the present improvements have been embodied in a sewing machine including a frame comprising a bed 10, from one end of which rises the hollow standard 11 of a tubular bracket arm 12 overhanging the bed and terminating at its free end in a hollow head 13. Journalled in the bracket arm 12 for rotary movement is a needle-bar actuating shaft 14

40 having a balance wheel 15 fixed to one of its ends and to its other end there is secured a crank disk 16 which actuates through the link 17, a needle-bar 18 which is journalled in bearings in the head 13 and which carries a needle 19. Fixed to the needle-bar actuating shaft 14 by a set screw 20 is a collar 21 which is transversely grooved to slidably receive a plate 22 having a feed advance eccentric 23 made integral therewith. Carried by and rotatable relative to the shaft 14 is an adjusting eccentric 24 which extends into the centrally located aperture 25 in the feed advancing eccentric 23. The aperture 25 in the eccentric 23 is elongated transverse of the direction of movement of the plate 22 so that the eccentric 24 has a line contact with the inner surface of the eccentric 23 in the direc-

55 tion of movement of the plate and at points diametrically opposite each other. Made integral with the adjusting eccentric 24 is a disk 26 formed with a slideway 27 which receives a slidable locking plate 28 formed with teeth 29 which are adapted to engage the teeth 30 on a flange 32 formed on a feed lift eccentric 33 which is fixed to the shaft 14 by means of a set screw 34. The disk 26 is provided with a stud 35 which carries a spring 36, one of the ends of which reacts against the shoulder 37 of the locking plate 28 and the other end reacts against the periphery of the disk 26. The spring 36 urges the plate 28 so that the teeth 29 on the plate and the teeth 30 on the flange 32 are normally engaged. In order to more effectively lock the disk 26 and eccentric 24 to the flange 32 when the machine is operating at high speed, the end 38 of the plate 28, which is on the opposite side of the shaft 14 from the teeth 29, is made heavier than the end carrying the teeth so that centrifugal force will assist in holding the teeth 29 and 30 in engagement.

5  
10  
15  
20  
25  
30  
35  
40  
45  
50  
55

The feed lift eccentric 33 actuates a pitman 40 which is connected to an arm 41 on the rock shaft 42 Fig. 2. The feed advancing eccentric 23 actuates a pitman 43 which is connected to an arm 44 on the rock shaft 45. A feed dog 46 which cooperates with a presser-foot 47 to advance the material is carried by the feed bar 48, which has one of its ends pivotally connected to the upstanding arms 49 on the rock shaft 45 and its other end operatively connected to the arm 50 on the rock shaft 42. From the above it will be obvious that eccentric 33 will impart to the feed dog 46 a rising and falling movement and the eccentric 23 will impart a feed and return movement.

In order that the operator may vary the amount of feeding movement imparted to the feed dog, a plunger 52 extends through an opening in the wall of the standard 11 and is spring urged outwardly by means of a spring 53 which extends through a hole in the plunger 52 and is secured to the wall of the standard by the screw 54. To prevent unauthorized adjustment of the eccentric the screw 54 and spring 53 may be removed, and the plunger 52 withdrawn from the opening. The screw 52<sup>a</sup> may then be inserted to close the opening. To adjust the feed advancing eccentric the operator pushes the plunger 52 inwardly and rotates the balance wheel 15. When the notch 56 in the disk 26 is opposite the plunger 52 the conical end 57 of the plunger enters the notch and engages the locking plate

28, Fig. 5 and slides it against the action of the spring 36 so that the teeth 29 are disengaged from the teeth 30 thereby unlocking the disk 26 from the flange 32. The disk 26 and adjusting cam 24 are held stationary by the end 57 of the plunger 52 and when the shaft 14 is turned the movement of the eccentric 24 relative to the shaft 14 shifts the plate 22 and eccentric 23 in a right line and relative to the shaft 14 to vary the amount of movement imparted to the pitman 43 and feed dog 46.

To indicate the number of stitches per inch to which the feeding mechanism has been adjusted, a pointer 58 (Fig. 1<sup>a</sup>) is fixed to the standard 11 and a semi-circular plate 59, having suitable indicia thereon, is fixed to the balance wheel 15.

The eccentric 33 is formed with a gear portion 60 having teeth which mesh with a gear 61 on a vertical shaft 62. Also fixed to the shaft 62 is a second gear 63 which meshes with a gear 64 carried by the hook shaft 65 journaled in suitable bearings on the bed 10. The gear ratio between the needle-bar shaft 14 and the hook shaft 65 is as 1:2 and, therefore the shaft 65 makes two complete rotations for each rotation of the needle-bar shaft 14. Fixed to the shaft 65 is a hook 66 which cooperates with a needle 19 in the formation of stitches. For a more complete understanding of the stitch-forming mechanism of the machine, reference may be had to my co-pending application Serial No. 152,707, filed July 9, 1937.

From the foregoing it will be observed that the higher the speed of the machine the greater the centrifugal force of the weighted end 38 of the locking plate 28 and as the weighted end 38 is diametrically opposite the teeth 29, it is obvious that these teeth will be pulled into contact with the teeth 30 with a greater force when the machine is operating at high speed than when it is operating at a slow speed.

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

1. In a sewing machine, a rotary shaft, a collar formed with a groove and secured to said shaft, a feed advance eccentric rotatable with said collar and slidable in said groove, said eccentric being formed with a centrally located opening, an adjustable eccentric rotatable relative to said shaft and extending into the opening in said feed advance eccentric, means for rotating said adjusting eccentric relative to said shaft, and spring biased means for locking said adjusting eccentric to said shaft.

2. In a sewing machine, a rotary shaft, a collar formed with a groove and secured to said shaft, a feed advance eccentric rotatable with said collar and slidable in said groove, said eccentric being formed with a centrally located opening, an adjustable eccentric rotatable relative to said shaft and extending into the opening in said feed advance eccentric, means for rotating said adjusting eccentric relative to said shaft, and a slide plate carried by said adjusting eccentric and having

means thereon for locking said adjusting eccentric.

3. In a sewing machine, a rotary shaft, a collar formed with a groove and secured to said shaft, a feed advance eccentric rotatable with said collar and slidable in said groove, said eccentric being formed with a centrally located opening, an adjustable eccentric rotatable relative to said shaft and extending into the opening in said feed advance eccentric, means for rotating said adjusting eccentric relative to said shaft, a slide plate carried by said adjusting eccentric and having teeth thereon, and a flange fixed to said shaft and formed with teeth which cooperate with the teeth on said slide plate for locking said adjusting eccentric to said shaft.

4. In a sewing machine, a shaft, a collar fixed to said shaft and formed with a groove, an actuating eccentric slidable in the groove in said collar and formed with a centrally located opening, an eccentric extending into said opening, a disk carried by said eccentric, a spring biased locking plate slidable on said disk and having teeth thereon, and a flange fixed to said shaft and having means thereon which cooperates with the teeth on said locking plate to prevent said disk from turning when said locking plate is in normal position.

5. In a sewing machine, a shaft, a collar fixed to said shaft and formed with a groove, an actuating eccentric slidable in the groove in said collar and formed with a centrally located opening, an eccentric extending into said opening, a disk carried by said eccentric, a spring biased locking plate slidable on said disk and having teeth thereon, a flange fixed to said shaft and having means thereon which cooperates with the teeth on said locking plate to prevent said disk from turning when said locking plate is in normal position, and manually controlled means for shifting said locking plate to permit said disk to be turned relative to the shaft.

6. In a sewing machine, a rotary shaft, an actuating eccentric carried by said shaft and shiftable in a direction at right angles to the longitudinal axis of the shaft, a member for shifting said eccentric, and a plate carried by said member and having portions which are located on opposite sides of said shaft, one of said portions being provided with locking means and the other portion being weighted whereby centrifugal force will act to more effectively hold said plate in its normal position when the shaft is rotating at speed.

7. In a sewing machine, a rotary shaft, a collar fixed to said shaft, an actuating eccentric shiftable relative to said collar, an adjusting member for shifting said eccentric, a flange on said shaft, a slidable plate carried by said adjusting member and having locking means on one end thereof which engages said flange, the other end of said plate being weighted whereby centrifugal force will act to more effectively hold the locking means on said plate in engagement with said flange when the shaft is rotated at speed.

RICHARD KAIER.