

June 9, 1925.

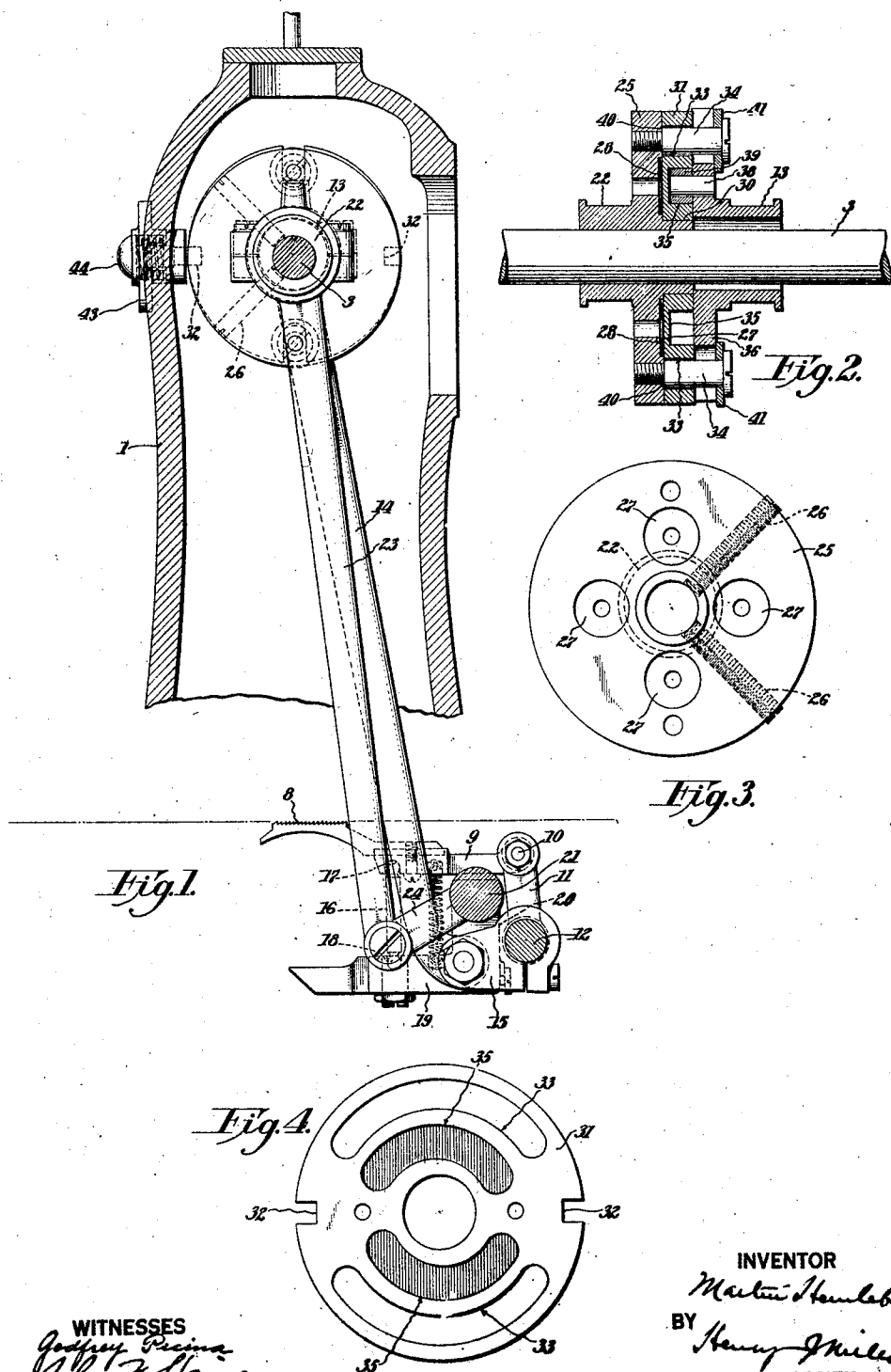
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FEEDING MECHANISM FOR SEWING MACHINES

Filed July 16, 1923

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

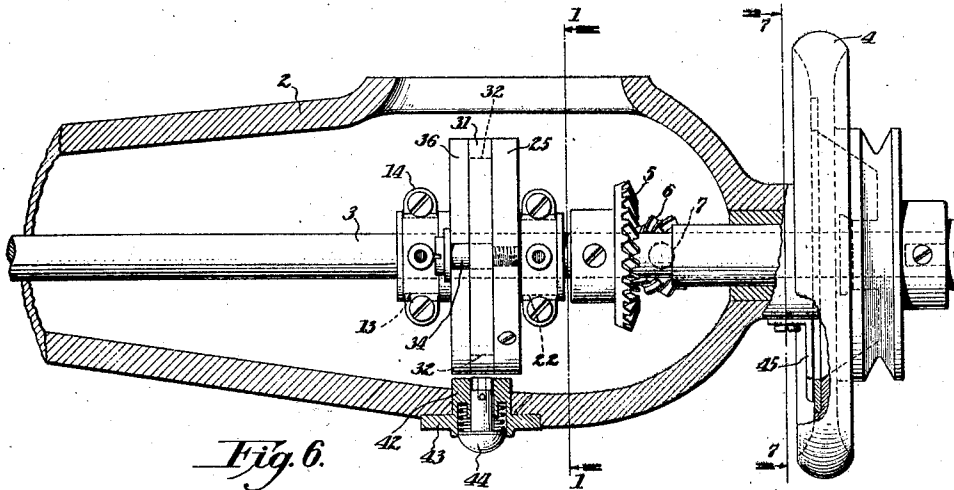


Fig. 6.

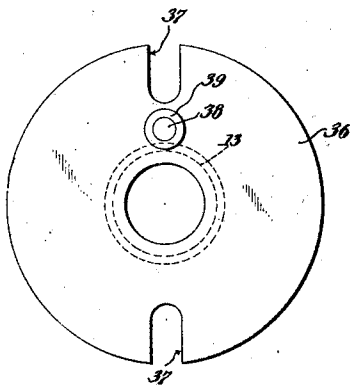


Fig. 5.

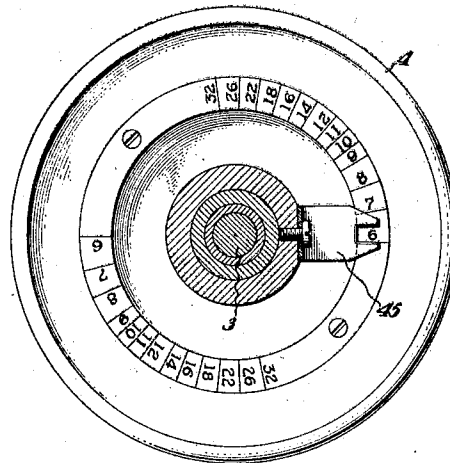


Fig. 7.

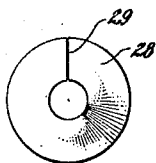


Fig. 8.

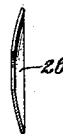


Fig. 9.

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UNITED STATES PATENT OFFICE.

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FEEDING MECHANISM FOR SEWING MACHINES.

Application filed July 16, 1923. Serial No. 651,801.

To all whom it may concern:

Be it known that MARTIN HEMLEB, a citizen of the United States, residing at Elizabeth, in the county of Union and State of New Jersey, has invented certain new and useful Improvements in Feeding Mechanisms for Sewing Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to feeding mechanism for sewing machines and has for an object to improve the feeding mechanism disclosed in the patents to Willcox, No. 572,039 and No. 572,041, both of November 24, 1896, by overcoming the tendency of the adjustable feed-advancing eccentric to chatter at high speeds and cramp within the eccentric strap at the upper end of the pitman which embraces it.

By referring to Fig. 2 of the Willcox Patent No. 572,041, it will be appreciated that at the reversal, say, from up to down motion of the feed-advancing pitman Q, a reaction strain is imposed upon the eccentric E which tends to rock the eccentric and its carrier-plate about the upper portion of the edge of the central or adjusting plate F as a fulcrum, thereby moving the lower portion of the eccentric carrier-plate away from the adjusting plate F and compressing the lower spring e^2 until arrested by the head of the adjacent screw e . In the recovery of the parts at a later stage, the lower spring e^2 returns the adjacent portion of the eccentric carrier-plate into contact relation with the adjusting plate F. Rapid repetition of these forces tends to produce chattering of the parts and cramps the eccentric E in its strap.

According to the present improvement each of the holding screw-pins is provided under its head with a stiff washer of a thickness sufficient to fill the space between the head of the screw-pin and the eccentric carrier-plate, so as to positively hold the carrier-plate against rocking or cramping movement and at all times with its axis parallel to the shaft axis. Internal spring disks are provided to exert the desired frictional drag upon the central adjusting plate.

Another feature of the present improvement consists in arranging the feed-lifting and feed-advancing eccentrics on opposite sides of the feed-adjusting disk, the feed-lifting eccentric being formed on the main

supporting disk of the feed-adjusting means, thereby simplifying the prior construction above referred to, reducing the space required on the main-shaft for the feed connections, and giving more room for the hook driving connections which extend downwardly alongside the feeding connections within the hollow vertical frame member of the machine.

In the accompanying drawings, Fig. 1 is a transverse vertical section on the line 1—1, Fig. 6, through the sewing machine main-shaft and standard, showing the feeding mechanism in elevation. Fig. 2 is a sectional view of the feed-adjusting means. Fig. 3 is an inner face view of the main-supporting disk for the feed-adjusting means. Fig. 4 is a face view of the intermediate or feed-adjusting disk. Fig. 5 is an inner face view of the carrier disk for the feed-advancing eccentric. Fig. 6 is a horizontal section through the sewing machine gooseneck, showing the main-shaft and feeding cams in top plan. Fig. 7 is a section on the line 7—7, Fig. 6, and Figs. 8 and 9 are, respectively, face and sectional views of one of the spring washers shown in Fig. 2.

In the preferred embodiment of the invention, as illustrated, 1 represents the hollow vertical member and 2 the horizontal member of a sewing machine gooseneck within which latter is journaled the main-shaft 3 carrying on its outboard projection the usual balance-wheel 4. Mounted on the main-shaft 3, within the hollow frame member or gooseneck, is the driving gear 5 which meshes with the driven gear 6 on the vertical shaft 7 extending downwardly within the vertical member 1 of gooseneck and at its lower end connected in the usual manner to drive the loop-taker or rotary hook shaft.

The feeding mechanism preferably comprises the feed-dog 8 carried by the feed-bar 9 which is pivoted at 10 to the feed-rocker arm 11 supported by the usual feed-advancing rock-shaft 12. The feed-advancing rock-shaft is actuated by means of the eccentric 13 which is connected by means of the pitman 14 to an arm 15 fast on the rock-shaft 12.

Rising and falling movements are imparted to the feed-bar 9 by means of the strut 16 having at its upper end a ball-

and-socket connection 17 with the feed-bar 9 and at its lower end a ball-and-socket connection 18 with the horizontal arm 19 of an L-shaped arm, the vertical member 20 of which is fast on the feed-lifting rock-shaft 21. The rock-shaft 21 is actuated by means of the eccentric 22 on the main-shaft 2; said eccentric being connected by means of the pitman 23 to an arm 24 fast on the rock-shaft 21.

Referring more particularly to Figs. 2 and 3, it will be seen that the feed-lift eccentric 22 is integral with the main-supporting disk 25 of the feed adjusting mechanism to be described. The disk 25 is fixed upon the main-shaft 2 by means of the quartered set-screws 26 and is provided in its inner face with 4 shallow circular recesses 27 for four dished spring washers 28; each of the spring washers being preferably split radially as at 29, Fig. 8.

Fitted to turn freely on the hub 30 of the carrier-disk 25 is the feed-adjusting disk 31 having the diametrically opposed peripheral notches 32, the concentric clearance slots 33 for the screw-pins 34, and the eccentric slots 35. Lying adjacent the adjusting disk 31 is the carrier-disk 36 integral with the feed-advancing eccentric 13. The disk 36 is formed with the radial guide-slots 37 which embrace the screw-pins 34 and confine the eccentric 13 to move radially of the axis of the main-shaft 2 during its adjustment on the main-supporting disk 25. The disk 36 carries a pin 38 on which is journaled a roller 39 entering one of the eccentric slots 35 on the adjusting disk 31. The screw-pins 34 are shouldered at 40 and are provided under their heads with stiff washers 41 which latter plus the disks 31 and 36 completely fill the space between the screw-heads and the main-supporting disk 25 without binding or gripping the adjusting disk 31. The spring washers 28 impose the requisite constant frictional drag upon the adjusting disk 31 to prevent shift of the latter under operating conditions.

It will be observed that the axis of the eccentric 13 is confined to parallelism with the axis of the main shaft. The disk 36 is confined to parallelism with the main-supporting disk 25 and there is no possibility of tilting of the disk 36 even under the heavy alternating stresses imposed by high-speed operation. As a result quiet operation and freedom from chattering is assured. Cramping of the eccentric 13 in its strap is also overcome.

In order to mount the disk 25 on the shaft 3 with the requisite rigidity and freedom from tilting tendency such disk should preferably be formed with a hub and by utilizing such hub for a feed lift eccentric a minimum of space longitudinally of the main-shaft is required and ample room re-

mains for the installation of the loop-taker drive. This possibility flows from having the feed eccentrics disposed on opposite sides of the adjusting mechanism.

The wall of the gooseneck is apertured at 42 to receive the bushing support 43 for the spring returned push-pin 44 which is adapted to enter one of the notches 32 in the feed-adjusting disk 31. When it is desired to adjust the feed, the operator pushes upon 70 the pin 44 and rotates the main-shaft by turning the balance-wheel 4 until the pin 44 enters one of the notches 32 and locks the adjusting disk 31. By further turning the balance-wheel 4, the disks 25 and 36 are 75 rotated relative to the adjusting disk 31 and the roller 39 is caused to travel along one of the eccentric slots 35, thus shifting the disk 36 and the feed-advancing eccentric 13 radially of the main-supporting disk 25 and altering the eccentricity of the eccentric 13. To assist in securing the desired feed adjustment; the balance-wheel may be graduated in stitches per inch, as shown in Fig. 7, and a pointer or indicator 45 mounted 80 on the machine frame. By turning the balance-wheel until the desired number appears in the slot in the indicator, the machine will be set to sew that number of stitches per inch. 85 90 95

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

1. Feeding mechanism for sewing machines comprising a main-shaft, a main supporting disk fast on said main-shaft, and having a hub constituting a feed-lifting eccentric, a carrier-disk adjustable relative to said main-supporting disk, a feed-advancing eccentric formed integral with said carrier-disk, an adjusting disk intermediate said main and carrier disks, a feed-dog, and operative connection between said eccentrics and said feed-dog. 100 105

2. Feeding mechanism for sewing machines comprising a main-shaft, a main supporting disk fast on said shaft, a feed-adjusting disk adjacent said main supporting disk, a carrier disk disposed adjacent said feed-adjusting disk and adjustable to vary its eccentricity relative to the main-shaft, a feed-advancing eccentric on the outer face of said carrier-disk, a feed-lift eccentric on the outer face of said main supporting disk, a feed-dog, and operative connections between said eccentrics and said feed-dog. 110 115 120

3. Feeding mechanisms for sewing machines comprising a main-shaft, a main supporting element fast on said shaft, a carrier element adjustable transversely of said shaft, an adjusting element between said main and carrier elements, unyielding connecting means confining said main and carrier elements in parallelism, yielding means for imposing a frictional drag upon said adjusting element, eccentrics carried, respec- 125 130

tively, by said main and carrier elements, a feed-dog, and operative connections between said eccentrics and said feed-dog.

5 4. Feed adjusting mechanism for sewing machines comprising a shaft, a main supporting disk fast on said shaft, a feed eccentric carrier disk mounted to slide radially of said main-supporting disk, an adjusting disk intermediate the main-supporting and feed-eccentric carrier-disks, rigid holding means engaging said carrier-disk for unyieldingly confining the latter to parallelism with the main supporting disk, and yielding means for imposing a frictional drag upon the adjusting disk.

10 5. Feed adjusting mechanism for sewing machines comprising a shaft, a main supporting disk fast on said shaft, a feed eccentric carrier-disk mounted to slide radially of said main supporting disk, an adjusting disk intermediate the main-supporting and feed-eccentric carrier-disks, rigid holding means engaging said carrier-disk for unyieldingly confining the latter

in parallelism with the main supporting disk, and yielding means intermediate the main-supporting and adjusting disks and spaced from said holding means for imposing a frictional drag upon the adjusting disk.

30 6. Feed adjusting mechanism for sewing machines comprising a shaft, a main supporting disk fast on said shaft, a feed eccentric carrier-disk mounted to slide radially of said main-supporting disk, an adjusting disk intermediate the main-supporting and feed-eccentric carrier-disks, rigid holding means engaging said carrier-disk for unyieldingly confining the latter to parallelism with the main supporting disk, the face of one of said disks adjacent another disk being provided with one or more recesses, and one or more dished spring washers disposed in said recess or recesses for imparting a frictional drag upon the adjusting disk.

45 In testimony whereof, I have signed my name to this specification.

MARTIN HEMLEB.