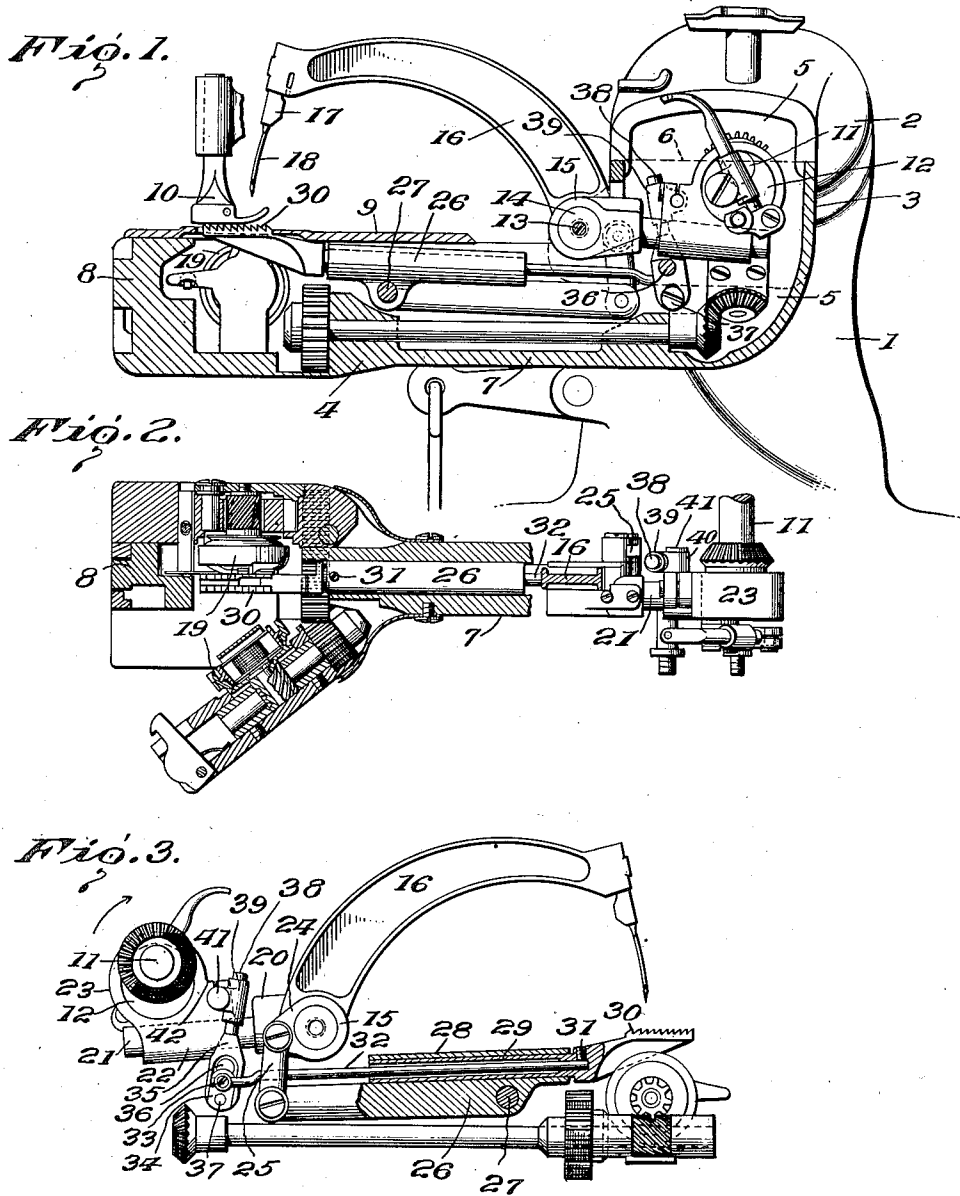


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 FEEDING MECHANISM FOR SEWING MACHINES.  
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1,280,681.

Patented Oct. 8, 1918.



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# UNITED STATES PATENT OFFICE.

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## FEEDING MECHANISM FOR SEWING-MACHINES.

1,280,681.

Specification of Letters Patent.

Patented Oct. 8, 1918.

Original application filed November 25, 1914, Serial No. 873,872. Divided and this application filed April 19, 1916. Serial No. 92,256.

*To all whom it may concern:*

Be it known that I, ALBERT H. DE VOE, a citizen of the United States, residing at Westfield, in the county of Union and State

of New Jersey, have 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 sewing machines and has for an object to provide an improved and simplified feeding mechanism therefor of the so-called four-motion type. The present improvement, while of general utility, is particularly adapted for use in a tube-forming sewing machine having a hollow, cylindrical, work-supporting arm within and longitudinally of which the feeding mechanism extends.

In the present instance the feeding mechanism which I have devised is shown applied to the work-supporting arm of a machine of the type disclosed in my co-pending application Serial No. 873,872, filed November 25, 1914, of which the present application is a division, and preferably comprises a tubular rock-lever mounted upon a fixed fulcrum within the work-supporting arm and having journaled therein lengthwise thereof a slide-bar sustaining the feed-dog.

The rock-lever and slide-bar have independent connections with an eccentric-strap embracing a driving eccentric on the main-shaft. These connections are so devised that the single driving eccentric will impart properly timed work-advancing and rising-and-falling movements to the feed-dog.

In the accompanying drawings forming a part of the specification, Figure 1 is a view, partly in section, of the work-supporting arm of a tube-forming sewing machine, showing the improved feeding mechanism in side elevation. Fig. 2 is a plan view of the same. Fig. 3 is a reverse side elevation, partly in section, of the feeding mechanism shown in Fig. 1.

As represented in the drawings, the frame comprises the hollow upright standard 1 sustaining at its upper end the lateral arm comprising the tubular member 2 terminating in the downwardly inclined extension 3 connected with the top of the horizontal work-supporting member 4 depending there-

from. At the junction of the extension 3 with the member 4 is a cavity 5 for housing certain of the operative parts, this cavity being partially closed by means of the end-cap 6, shown in dotted lines in Fig. 1.

The outer or free end portion of the work-supporting member 4 is connected with the intermediate frame member 2 by means of a contracted portion 7 and carries a post 8 supporting one end of a throat-plate 9 provided with the usual needle and feed-dog apertures. The throat-plate 9 extends some distance in front of the presser-foot 10, as shown in Fig. 1, and serves to partially close the upper part of the work-supporting member 4.

Mounted within the intermediate frame member 2 is the main shaft 11 having secured thereon at its outer end, the actuating eccentric 12 for imparting operative movements to the needles and the feeding mechanism.

Secured upon the inner face of the end-cap 6 by means of the screw 13 is a fulcrum-stud 14 disposed above the work-supporting member and near its junction with the intermediate frame member 2. Mounted upon the stud 14 is the hub 15 of the needle-carrying lever 16 which carries at its outer end a needle-clamp 17 which in practice carries two eye-pointed needles 18 cooperating with the loop-takers 19 in the production of stitches. The hub 15 of the needle-lever 16 is formed with the rearwardly extending boss 20 sustaining the pin 21 which is slidingly fitted within a tangential socket or aperture in the boss 22 formed on the lower side of the sleeve or eccentric strap 23 which is in turn fitted upon the actuating eccentric 12 on the main-shaft. The needle-arm 16 derives, from the described pin-and-socket connection with the sleeve or eccentric strap 23, vibratory movements from which the needles 18 derive their reciprocations.

The hub of the needle-lever 16 has upon one side a rearward extension 24 to which is pivotally connected one end of a link 25 whose opposite end is similarly connected with the rearwardly extending arm of a rock-lever 26 mounted upon the fixed transverse fulcrum-pin 27 and formed with a longitudinally extending tubular portion 28 disposed above the fulcrum-pin. Slid-

ingly fitted within the member 28 is the tubular-bar 29 constituting the supporting shank of the feed-dog 30.

Secured by means of a set-screw 31 within a socket in the forward end of the slide-bar 29 is one end of a flexible rod or link 32 whose opposite end is secured within the rocking-stud pin 33 mounted upon the adjustable block 34 fitted within a lateral recess in the said rock-lever 35. The lever 35 is mounted upon the fulcrum-stud 36 carried by the cap-plate 6. The block 34 is mounted for adjustment toward and from the fulcrum 36 and is secured in position by means of the screw 37 passing through an elongated slot in the lever 36 and tapped in the said block 34 which may obviously be adjusted by loosening the screw 37, shifting the block and retightening said screw. The upwardly extending arm of the lever 35 is formed as a slide-pin 38 which is fitted within a lateral tubular boss or socket 39 of a collar 40 embracing the shouldered crank-pin 41 which is secured in the split boss 42 of the eccentric strap 23.

From its described connections, the feed-dog receives its to-and-fro or work-advancing movements from the sleeve or eccentric strap 23 while tilting movements are imparted to the rock-lever 26, and hence rising-and-falling movements are communicated to the feed-dog 30, by the link connection 25 of the rock-lever 26 with the needle-arm 16, which in turn derives its operative movements from the described pin-and-socket connection with the eccentric strap 23. Hence the reciprocating movements of the needles and both the work-advancing and rising-and-falling movements of the feed-dog are derived from the common actuating element 12 upon the shaft 10. The proper relative timing of these component motions of the feed-dog is secured by arranging the pins 21 and 38, together with their sockets, at a large angle to one another, in the neighborhood of 90° as shown in Fig. 3, so that while one pin is at the end of its stroke the other pin is near the middle of its stroke. The arrow, Fig. 3, indicates the direction of rotation of the shaft 11.

While the present improvement is described herein in its preferred form, it is evident that it may be materially modified in the construction and arrangement of its component parts within the scope of the appended claims.

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

1. In a sewing machine, in combination, a frame comprising a standard and an elongated, hollow work-supporting arm free at one end and at its opposite end joined to said standard, a main-shaft, a driving member mounted eccentrically thereof at the end of said work-arm opposite the free end, a

follower element deriving movement from said driving member, a feed-dog mounted to perform rising-and-falling and feed-and-return movements at the free end of said work-arm, and separate lines of connections between said follower element and said feed-dog for imparting to the latter the components of its feeding motion, said connections extending lengthwise of and within said work-arm.

2. In a sewing machine, in combination, a frame comprising a supporting standard and an elongated, hollow, work-supporting arm free at one end and at its opposite end joined to said supporting standard, a rock-lever mounted within said work-arm, a feed-dog slidingly mounted on said rock-lever and adapted to operate at the free end of said work-arm, a driving shaft, an eccentrically mounted actuating element, a follower element cooperating therewith, an operative connection between said follower element and said rock-lever for raising and lowering said feed-dog, and a link-connection between said follower element and said feed-dog for imparting feed-and-return movements to the latter.

3. In a sewing machine, in combination, a frame including a standard formed with an intermediate supporting member and a work-arm free at one end and at its opposite end joined to said intermediate member, a driving shaft extending within and lengthwise of said intermediate member, an actuating eccentric mounted upon said shaft, a follower element embracing said eccentric, a feed-lift lever extending lengthwise of said work-arm, a feed-dog slidingly mounted upon said lever, a connection with said follower for rocking said lever, and a link connection between said follower and said feed-dog for sliding the latter on said lever.

4. In a sewing machine, the combination with a rotary shaft and an actuating eccentric mounted thereon, of feeding mechanism comprising a rock-lever mounted upon a fixed fulcrum, a slide-bar journaled therein transversely to said fulcrum and sustaining a feed-dog, an eccentric strap embracing said eccentric and formed with a socket, a rocking member having a pin slidingly fitted within said socket of said eccentric strap and operatively connected with said rock-lever, and an operative connection between said eccentric strap and said slide-bar carrying the feed-dog.

5. In a sewing machine, the combination with a rotary shaft and an actuating eccentric mounted thereon, of feeding mechanism comprising a rock-lever mounted upon a fixed fulcrum, a slide-bar journaled therein transversely of said fulcrum and sustaining a feed-dog, an eccentric strap embracing said eccentric and formed with a socket, a rocking member having a pin slidingly fitted

within said socket of the eccentric strap and operatively connected with said rock-lever, a socket-member pivotally sustained by said eccentric strap, a vibratory lever mounted upon a fixed fulcrum and having a pin slidingly fitted within said pivotally mounted socket-member, and a connection between said feed-dog carrying slide-bar and said vibratory lever.

6. In a sewing machine, the combination with a rotary shaft and an actuating eccentric mounted thereon, of feeding mechanism comprising a rock-lever mounted upon a fixed fulcrum, a slide-bar journaled therein transversely to said fulcrum and sustaining a feed-dog, an eccentric strap embracing said

eccentric and formed with a socket, a rocking member having a pin slidingly fitted within said socket of the eccentric strap and operatively connected with said rock-lever, a socket-member pivotally sustained by said eccentric strap, a vibratory lever mounted upon a fixed fulcrum and having a pin slidingly fitted within said pivotally mounted socket-member, and a connection between said feed-dog carrying slide-bar and said vibratory lever adjustable toward and from the fulcrum of the latter.

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

ALBERT H. DE VOE.