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FEEDING MECHANISM FOR SEWING MACHINES

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2 Sheets-Sheet 1

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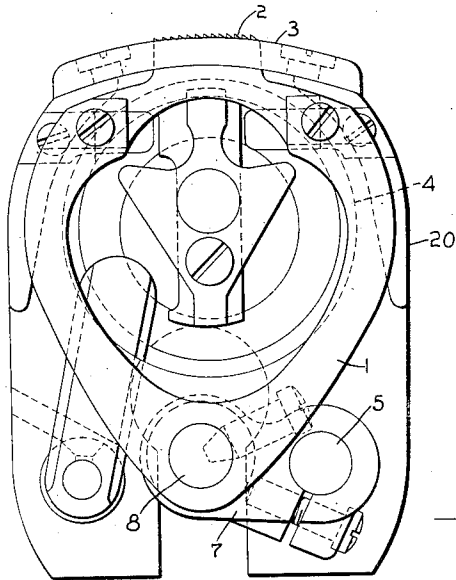


Fig. 4.

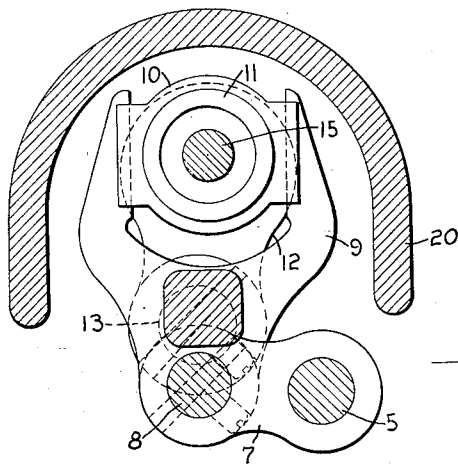


Fig. 3.

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FEEDING MECHANISM FOR SEWING MACHINES

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The Singer Manufacturing Company, Elizabeth, N. J., a corporation of New Jersey

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In Great Britain November 11, 1940

5 Claims. (Cl. 112—215)

(Granted under the provisions of sec. 14, act of
March 2, 1927; 357 O. G. 5)

This invention relates to feeding mechanism for sewing machines, more particularly applicable to sewing machines of the type formed with a cylindrical work-arm as used, for example, in the stitching and trimming of footwear.

An object of the invention is to produce a construction in which the free end or head of the work-arm is rendered compact by reason that certain elements of the feeding mechanism, in lieu of being located in the work-arm head, are located within the contour of the arm but spaced from, i. e., rearward of, said head.

Feeding mechanism according to the invention includes a feed-dog-carrier mounted within the work-arm head on the forward end of a feed-shaft which is operatively connected within the body of the work-arm to a feed-rock-shaft, and a feed-lift-shaft journaled within the work-arm and carrying a bracket fixed thereto in which said feed-shaft is journaled, said feed-rock-shaft and said feed-lift-shaft deriving actuation from the main or upper shaft of the sewing machine.

The invention is illustrated in the accompanying drawings in which Fig. 1 is a side elevation of a sewing machine incorporating the improved feeding mechanism. Fig. 2 is a fragmentary transverse vertical section mainly on the line A—A of Fig. 1. Fig. 3 is a vertical transverse section on the line B—B of Fig. 1. Fig. 4 is an end elevation looking on the front end of the work-arm. Figs. 3 and 4 are drawn to a larger scale than Figs. 1 and 2.

Referring to the drawings, 20 denotes a cylindrical work-arm, 21 a standard uprising from the rear end of the work-arm 20, and 22 an overhanging bracket-arm terminating in a head 23, constituting the frame of the sewing machine.

Journaled in the bracket-arm 22 is a main shaft 24 provided at its rear end with a driving pulley and flywheel 25 and at its front end with a crank disc 26 which drives, through the medium of a connecting rod 27, a reciprocatory needle-bar 28 which is journaled in the head 23 and is equipped at its lower end with a needle 29. 30 denotes a presser-bar also mounted in the head 23 and equipped at its lower end with a bracket 31 to which is connected an arm 32 carrying a presser-wheel 33 which co-operates with a feed-dog 2 projecting upwardly through a throat-plate 3 attached to the head of the work-arm 20.

Mounted within the head of the work-arm 20, in front of a rotary loop-taker 4 which co-operates with the needle 29, is a bifurcated feed-dog-carrier 1 secured on the forward end of a feed-shaft 8. The feed-shaft 8 and therewith

the feed-dog-carrier derive rising and falling movements from a feed-lift-shaft 5 journaled within the work-arm 20 and having fixed on its rear end a crank-arm 5' which is operatively connected to the lower end of a pitman 6 of which the upper end is formed as a strap 6' embracing an eccentric 34 secured on the main shaft 24. Fixed to the shaft 5, within the work-arm 20, is a bracket 7 in which is journaled, eccentrically of the shaft 5, the feed-shaft 8. Mounted on the rear end of the feed-shaft 8, within a laterally exposed body part of the work-arm 20, is a forked lever 9 which slidably straddles a bush 10 journaled on a boss 11 carried by a lever 12 secured on the forward end of a short feed-rock-shaft 13 journaled within the work-arm 20, the construction being such that the feed-shaft 8 rises and falls under the action of the shaft 5 and is also oscillated, i. e., performs feeding movements, about its own axis under the action of the feed-rock-shaft 13. Fixed on the rear end of the feed-rock-shaft 13 is a crank-arm 13' to which is operatively connected the lower end of a pitman 14 provided at its upper end with a strap 14' embracing an eccentric 35 secured on the main shaft 24.

The loop-taker 4 is secured on the forward end of a shaft 15 journaled within the work-arm 20 and loosely surrounded by the boss 11. At its rear end the shaft 15 is connected by bevel gear wheels 37, 38 with the lower end of an upright shaft 39 connected at its upper end by bevel gear wheels 40, 41 with the shaft 24.

Lateral cut-aways 20' in the work-arm 20 permit ready access to the feed-actuating mechanism.

What is claimed is:

1. In a sewing machine having a frame including a bracket-arm and a work-arm formed with a head, in combination, a main shaft journaled in said bracket-arm, a feed-rock-shaft journaled within said work-arm, a feed-lift-shaft journaled within said work-arm, a bracket fixed to said feed-lift-shaft within said work-arm, a feed-shaft journaled in said bracket and eccentric to said feed-lift-shaft, operative connections within the body of said work-arm for communicating oscillatory movements to said feed-shaft from said feed-rock-shaft, a feed-dog carrier mounted within the head of said work-arm on the forward end of said feed-shaft, and operative connections between said feed-rock-shaft and feed-lift-shaft and said main shaft.

2. In a sewing machine having a frame including a bracket-arm and a work-arm formed with

a head, in combination, a main shaft journaled in said bracket-arm, a feed-rock-shaft journaled within said work-arm, a lever secured on the forward end of said feed-rock-shaft, a bush mounted on said lever, a feed-lift-shaft journaled within said work-arm, a bracket fixed to said feed-lift-shaft, a feed-shaft journaled in said bracket and eccentric to said feed-lift-shaft, a forked lever mounted on the rear end of said feed-shaft within the body of said work-arm and slidably engaging said bush whereby oscillatory movements are imparted to said feed-shaft by said feed-rock-shaft, a feed-dog carrier mounted within the head of said work-arm on the forward end of said feed-shaft, and operative connections between said feed-rock-shaft and feed-lift-shaft and said main shaft.

3. In a sewing machine having a frame including a bracket-arm and a work-arm formed with a head, in combination, a main shaft journaled in said bracket-arm, a loop-taker shaft journaled within said work-arm, a feed-rock-shaft journaled within said work-arm, a lever secured on the forward end of said feed-rock-shaft, a boss carried by said lever and loosely surrounding said loop-taker-shaft, a bush journaled on said boss, a feed-lift-shaft journaled within said work-arm, a bracket fixed to said feed-lift-shaft within said work-arm, a feed-shaft journaled in said bracket and eccentric to said feed-lift-shaft whereby to rise and fall with rocking movements of said feed-lift-shaft, a forked lever mounted on the rear end of said feed-shaft within the body of said work-arm and slidably engaging said bush, whereby oscillatory movements are imparted to said feed-shaft by said feed-rock-shaft, a feed-dog carrier mounted within the head of

said work-arm on the forward end of said feed-shaft, and operative connections between said feed-rock-shaft and feed-lift-shaft and said main shaft.

5 4. In a sewing machine having a frame including a bracket-arm and a work-arm formed with a head, in combination, a main shaft journaled in said bracket-arm, a feed-rock-shaft journaled within said work-arm, a feed-lift-shaft journaled within said work-arm, a bracket fixed to said feed-lift-shaft within said work-arm, a feed-shaft journaled in said bracket, a pair of interconnected levers within the body of said work-arm carried, respectively, by said feed-shaft and said feed-rock-shaft, a feed-dog carrier mounted within the head of said work-arm on the forward end of said feed-shaft, and operative connections including cranks and pitmans between said feed-rock-shaft and feed-lift-shaft and said main shaft.

20 5. In a sewing machine having a frame including a bracket-arm and a work-arm formed with a head, in combination, a main shaft journaled in said bracket-arm, a feed-rock-shaft journaled within said work-arm, a feed-lift-shaft journaled within said work-arm, a bracket fixed to said feed-lift-shaft within said work-arm, a feed-shaft journaled in said bracket and eccentric to said feed-lift-shaft, connections within the body of said work-arm for communicating feeding movements from said feed-rock-shaft to said feed-shaft, a feed-dog carrier mounted within the head of said work-arm on the forward end of said feed-shaft, and operative connections between said feed-rock-shaft and feed-lift-shaft and said main shaft.

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