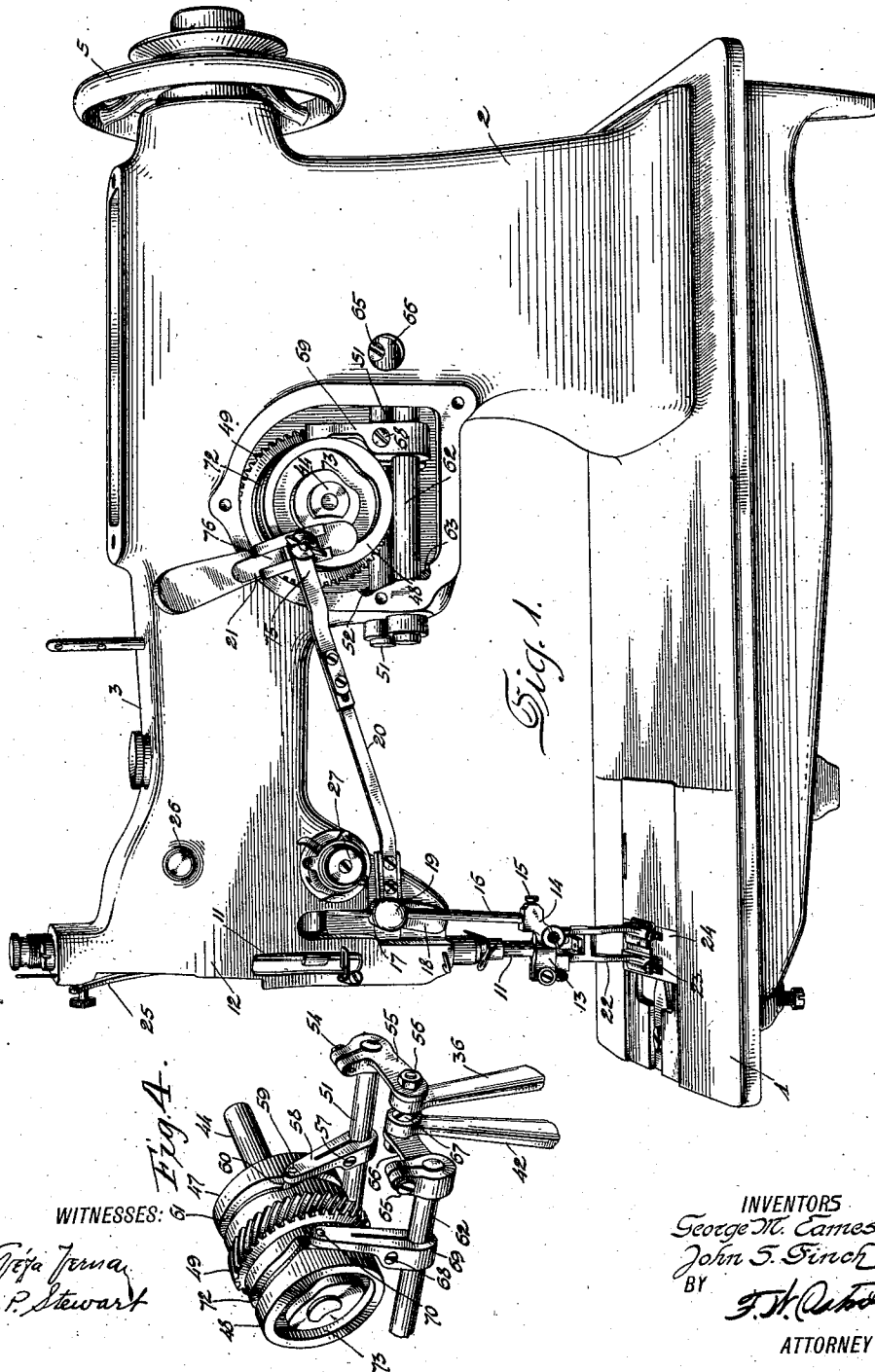


G. M. EAMES & J. S. FINCH.
FEEDING MECHANISM FOR HEMSTITCH SEWING MACHINES.
APPLICATION FILED MAR. 9, 1911.

1,049,567.

Patented Jan. 7, 1913.

3 SHEETS—SHEET 1.



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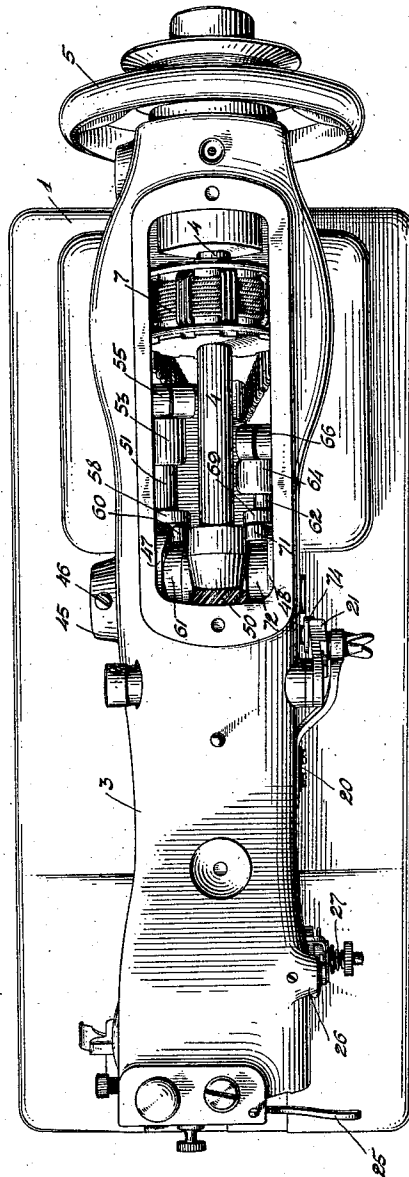


Fig. 2.

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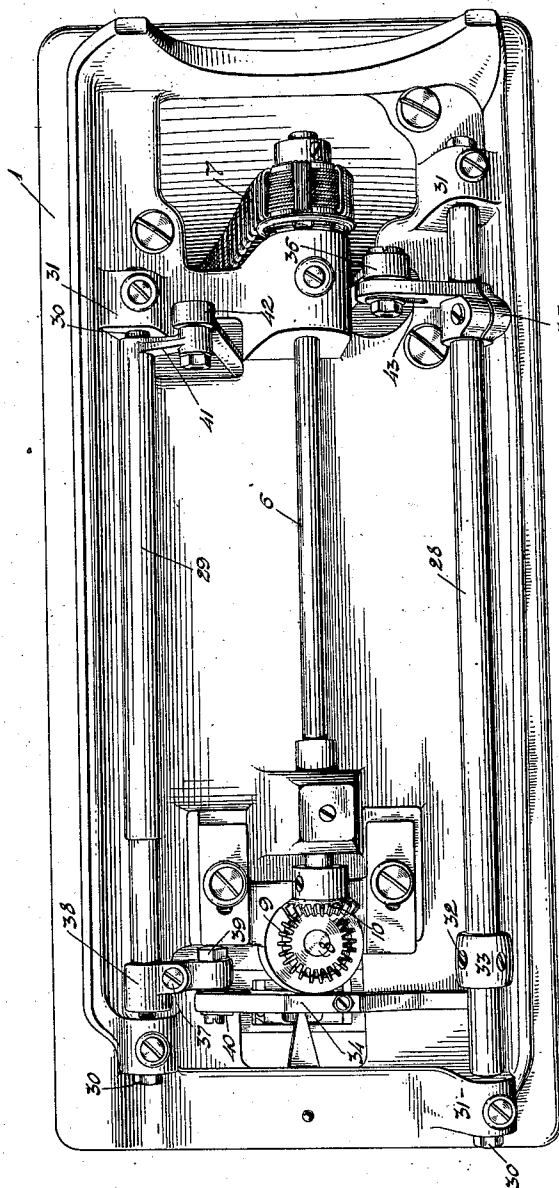


Fig. 3.

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UNITED STATES PATENT OFFICE.

GEORGE M. EAMES AND JOHN S. FINCH, OF BRIDGEPORT, CONNECTICUT, ASSIGNORS
TO THE SINGER MANUFACTURING COMPANY, A CORPORATION OF NEW JERSEY.

FEEDING MECHANISM FOR HEMSTITCH SEWING-MACHINES.

1,049,567.

Specification of Letters Patent.

Patented Jan. 7, 1913.

Application filed March 9, 1911. Serial No. 613,224.

To all whom it may concern:

Be it known that we, GEORGE M. EAMES and JOHN S. FINCH, citizens of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Feeding Mechanism for Hemstitch Sewing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to improvements in feeding mechanisms for hemstitch sewing machines, and has for its primary object to provide a construction that will meet the requirements of fabrics of comparatively firm and heavy texture, such as butchers', homespun and huckaback linen, and linen damask.

In the construction of machines of the class herein referred to, the important object sought to be attained is to provide a feeding mechanism which will insure that the reverse feed movement will position the previously made needle puncture in line with the descending needle, as upon this largely depends the superior quality of the product.

Hemstitch sewing machines as heretofore constructed, when operating upon materials of comparatively light texture, effect, through the tightening of the stitch, an opening sufficiently large to insure that the needle will subsequently descend therethrough; but they fail to produce the desired alinement of needle and needle puncture when operating upon fabrics of the texture first referred to, wherein the tightening of the stitch adds little, if anything, to the size of the opening made by the needle.

To overcome this difficulty is the purpose of the present invention, and to this end the feed actuating elements are constructed and combined to transmit from the prime members of the trains of connections, positively determined, oppositely arranged, feed movements of the feed-dog.

In the accompanying drawings illustrating the invention, in the several figures of which like parts are similarly designated, Figure 1 is a view in front side elevation of a hemstitch sewing machine equipped with the present invention, the bracket arm plate and cam covering plate being omitted. Fig. 2 is a top plan view of Fig. 1. Fig. 3 is an underside view of the sewing machine bed-

plate shown in Figs. 1 and 2. Fig. 4 is a detail, in perspective, of the cam-shaft, parts carried by said shaft and certain elements later to be referred to for transmitting motion from the main or needle-bar-driving shaft to the feed-dog.

Referring to the drawings, 1 represents the sewing machine bed-plate upon which is mounted the bracket arm comprising the standard 2 and arm bracket 3.

4 is the main or needle-bar-driving shaft mounted to rotate in suitable bearings formed in the bracket arm, 5 the band or hand wheel carried by said main shaft, 6 the loop-taker-actuating shaft mounted to rotate in suitable bearings formed on the underside of said bed-plate, 7 the belt for operatively connecting the shaft 6 with the shaft 4, and 8 the loop-taker shaft connected with the shaft 6 by bevel gears 9 and 10 and carrying at its upper end one form of commonly-employed loop-taker (not shown).

11 represents the needle-carrying bar mounted to move vertically in the head 12 of the arm bracket and provided at its lower end with a bracket 13 upon which is pivotally mounted the needle-carrying bracket 14 fitted to receive the usual eye-pointed needle (not shown). Secured in the bracket 14, by screw 15, is the lower end of a rod 16, the opposite end of which is slidably connected with a rocking stud 17 carried by a rock-lever 18 pivoted in the head 12, said rocking stud having threaded into it a stud screw 19 upon which is pivoted one end of the needle-vibrating connection 20, the opposite end of said connection being connected with the needle-vibrating lever 21 pivoted upon the arm bracket.

22 represents the presser-foot secured to the lower end of one form of commonly-employed presser-carrying bar (not shown) mounted in the usual manner to move vertically in the head 12, 23 the feed-dog, 24 the throat-plate, 25 the take-up, and 26 and 27 the usual thread-check and needle-thread tension, respectively.

28 represents the oscillating feed rock-shaft, and 29 the oscillating feed-lift rock-shaft mounted upon pintle screws, as 30, secured in suitable lugs, as 31, depending from the lower side of the bed-plate 1. To the forward end of the feed rock-shaft is secured, by screw 32, a bracket arm 33 (the collar portion only being shown) which car-

ries the usual stud screw (not shown) upon which is pivoted one end of the feed-dog-carrying bar 34. The opposite end of the rock-shaft 28 carries a bracket arm 35, to the outer end of which is adjustably secured the lower end of the feed rock-shaft connection 36. To the forward end of the feed-lift rock-shaft 29 is secured, by pinch screw 37, an arm bracket 38 into the arm of which is threaded a screw 39, the outer, unthreaded end of said screw being provided with a slide block 40 which enters the usual slot (not shown) formed in the end of the feed-dog-carrying bar 34, the opposite end of said feed-lift rock-shaft having formed integral with it an arm 41 connected at its outer end with the feed-lift rock-shaft connection 42.

All of the foregoing elements are in construction and operation substantially the same as those commonly employed in connection with the earlier forms of hemstitch sewing machines, except that the lower end of the connection 36 is adjustable with respect to the slot 43 formed in the bracket arm 35.

44 represents a cam-shaft which is mounted at one end in a bearing 45, forming a part of the arm bracket, and secured against movement by screw 46, the opposite end of said shaft resting in a suitable bearing formed in the cam covering plate (omitted from the drawings, but referred to in the matter descriptive of Fig. 1). Upon the shaft 44 is mounted a feed-cam 47, feed-lift cam 48 and a spiral tooth gear-wheel 49, said cams and gear wheel, in the present instance, being formed integral, the gear-wheel 49 meshing with the spiral gear 50 carried by the main shaft 4. The gears 49 and 50 are of the ratio of one to three, thus giving to said cams one rotation to three rotations of said main shaft.

51 represents the feed-connection rock-shaft mounted to oscillate in bearings 52 and 53, said rock-shaft having secured to its inner end, by pinch screw 54, a crank-arm 55 provided with a stud bolt 56 (the threaded end only of which is shown) upon which is fulcrumed the upper end of the feed rock-shaft connection 36. Secured upon the rock-shaft 51, by pinch screw 57, is a feed-cam lever 58 provided with a stud 59 carrying a cam roller 60 which tracks a cam-groove 61 formed in the feed-cam 47, the median vertical plane of said cam-groove being in substantially vertical alignment with the axis of oscillation of the rock-shaft 51, thus transmitting from the main shaft, through the connections 50, 47, 58, 51, 55, 36, 35, 28, 33 and 34, feed movements to the feed-dog 23. The cam-groove 61 is formed to give to the feed-dog 23 two forward and one backward feed movements for each hemstitch figure, as is common to hem-

stitch sewing machines, the amplitude of the feed movements of said feed-dog being governed by the adjustment of the lower end of the connection 36 with respect to the slot 43 formed in the bracket arm 35.

62 represents the feed-lift connection rock-shaft mounted to oscillate in bearings 63 and 64, said rock-shaft having secured to its inner end, by pinch screw 65, a crank-arm 66 provided with a stud bolt 67 upon which is fulcrumed the upper end of the feed-lift rock-shaft connection 42. Upon the rock-shaft 62 is secured, by pinch screw 68, a feed-lift cam-lever 69 provided with a stud 70 carrying a cam roller 71 which latter tracks the cam-groove 72 formed in the feed-lift cam 48, the median vertical plane of said cam-groove being in substantially vertical alignment with the axis of oscillation of the rock-shaft 62, thus transmitting from the main shaft, through the connections 50, 48, 69, 62, 66, 42, 29, 38 and 40, vertical movements to the feed-dog 23.

73 represents a cam-groove formed in the cam 48, said groove coacting with a follower 74, carried by the needle-vibrating lever 21, to transmit to the needle carrier, through the connections 20, 19, 16 and 14, the lateral movements necessary for the formation of a hemstitch figure, the amplitude of said lateral movements being controlled by the adjustment of the end 75 of the connection 20 with respect to the slide-way 76 formed in the lever 21.

Claims:—

1. In a feeding mechanism for sewing machines, the combination of a bracket-arm, a rotary main-shaft mounted in said bracket-arm, a bed-plate, a feed-dog mounted below said bed-plate and connections between said main-shaft and feed-dog for giving to the latter feed and feed-lift movements, said connections including a feed-cam having in its periphery a feed cam-groove and a feed-lift cam having in its periphery a feed-lift cam-groove, said cams being located in said bracket-arm and having their axes of rotation lying in a direction transverse to the axis of said main-shaft, said cam-grooves being located one at one side and the other at the opposite side of a vertical plane intersecting the axis of said main-shaft.

2. In a feeding mechanism for sewing machines, the combination of a bracket-arm, a rotary main-shaft mounted in said bracket-arm, a bed-plate, a feed-dog mounted below said bed-plate and connections between said main-shaft and feed-dog for giving to the latter feed and feed-lift movements, said connections including an integrally formed element comprising a feed-cam having in its periphery a feed-cam groove, a feed-lift cam having in its periphery a feed-lift cam-groove and a spirally toothed gear section,

said integrally formed element being located in said bracket-arm and having its axis of rotation lying in a direction transverse to the axis of said main-shaft, said cam-groove being located one at one side and the other at the opposite side of a vertical plane parallel with and passing through the axis of said main-shaft.

3. In a feeding mechanism for sewing machines, the combination of a bracket-arm, a rotary main-shaft mounted in said bracket-arm, a bed-plate, a feed-dog mounted below said bed-plate and connections between said main-shaft and feed-dog for giving to the latter feed and feed-lift movements, said connections including feed and feed-lift cams mounted in said bracket-arm, feed, and feed-lift rock-shafts journaled beneath said bed-plate, feed and feed-lift connection

rock-shafts journaled in said bracket-arm parallel with said rock-shafts journaled below said bed-plate, feed and feed-lift cam-levers secured to the respective feed and feed-lift connection rock-shafts and in operative engagement with the respective feed and feed-lift cams, and connections between said feed and feed-lift connection rock-shafts and their respective rock-shafts journaled beneath said bed-plate, and means for actuating said feed and feed-lift cams.

In testimony whereof, we have signed our names to this specification, in the presence of two subscribing witnesses.

GEORGE M. EAMES.
JOHN S. FINCH.

Witnesses:

ABBIE M. DONIHUE,
JAS. J. COX.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."