April 16, 1957 J. P. ENOS 2,788,757

WORK-JOGGING ATTACHMENTS FOR SEWING MACHINES

Filed Feb. 2, 1955

Fig.1

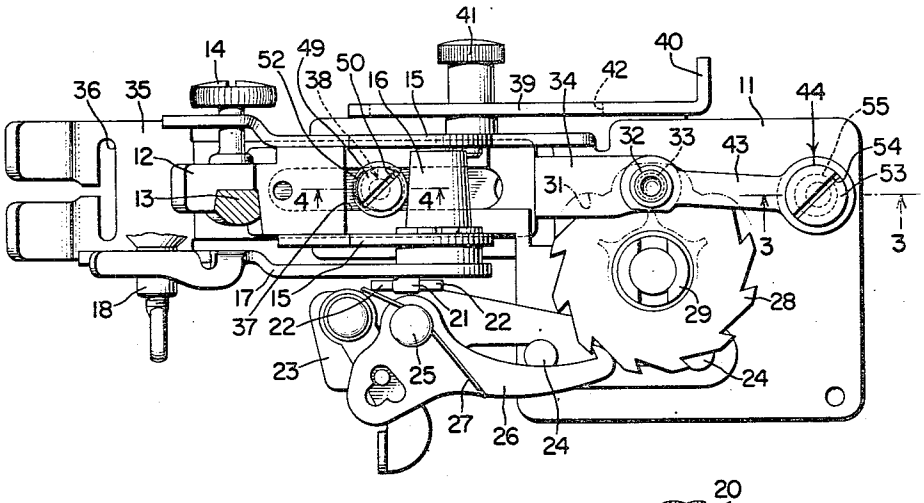
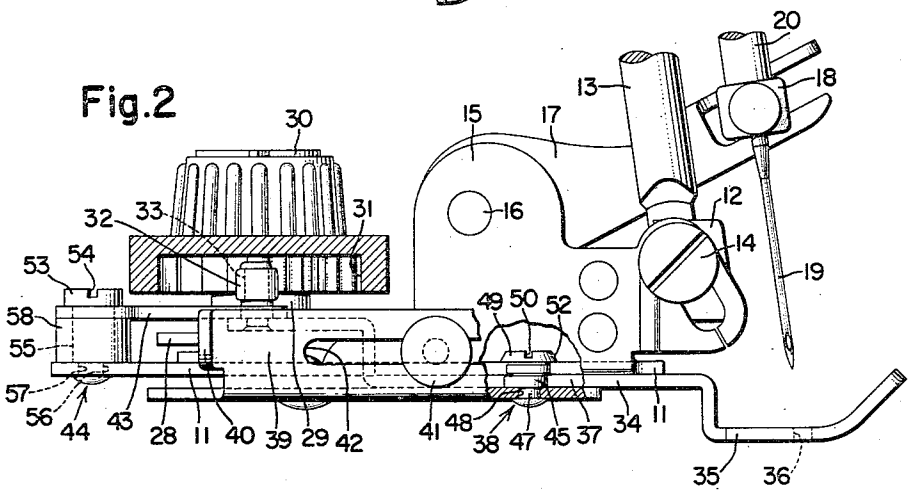


Fig.2



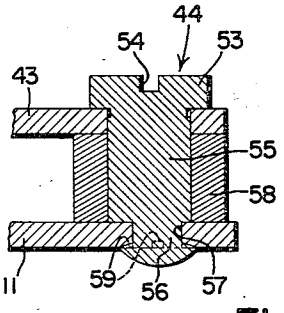


Fig.3

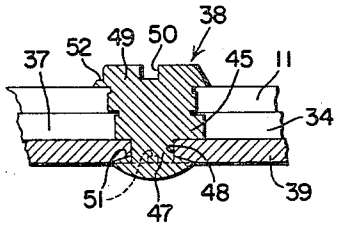


Fig.4

INVENTOR
John P. Enos

WITNESS
William Martin

BY J. E. Stanford

ATTORNEY

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WORK-JOGGING ATTACHMENTS FOR SEWING MACHINES

John P. Enos, Union, N. J., assignor to The Singer Manufacturing Company, Elizabeth, N. J., a corporation of New Jersey

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6 Claims. (Cl. 112—160)

This invention relates to work-jogging attachments for sewing machines and, more particularly, to improvements in the actuating mechanism of work-jogging attachments.

It is an object of this invention to provide means whereby attachment parts having large manufacturing tolerances may be so positioned during assembly that when the attachment is applied to a sewing machine, the work-jogging foot will be centered perfectly with respect to the needle axis of the sewing machine.

With the above and additional objects and advantages in view as will hereinafter appear, this invention comprises the devices, combinations and arrangements of parts hereinafter described and illustrated in the accompanying drawings of a preferred embodiment in which:

Fig. 1 represents a top plan view of a work-jogging attachment in which the pattern cam has been removed to expose the actuating mechanism and only a portion of the cam groove is illustrated in dot-dashed lines;

Fig. 2 represents a side elevational view of the work-jogging attachment with the pattern cam in section and a portion of the frame and the bight control slider broken away and sectioned to expose the actuating mechanism;

Fig. 3 is an enlarged cross-sectional view taken substantially along line 3—3 of Fig. 1; and

Fig. 4 is an enlarged cross-sectional view taken substantially along line 4—4 of Fig. 1.

Referring to the drawings, the actuating mechanism of the present invention is embodied in a work-jogging attachment of the type disclosed in my copending patent application Serial No. 461,149, filed October 8, 1954, to which reference may be had for a detailed description of those features of the attachment which are not directly concerned with the actuating mechanism of this invention.

The work-jogging attachment comprises a frame 11 which carries a block 12 slotted to embrace a sewing machine presser bar 13 to which the attachment frame is secured by a captive thumb screw 14 in place of the usual sewing machine presser foot.

Journaled between spaced upstanding arms 15—15 of the attachment frame is a stud shaft 16 to which a forked attachment actuating arm 17 is secured. As is customary in sewing machine work-jogging attachments, the forked arm is adapted to embrace a clamp 18 by which a needle 19 is removably secured in the extremity of a sewing machine needle bar 20. Reciprocation of the sewing machine needle bar is thus harnessed to oscillate the attachment actuating arm 17.

A lug 21 struck out from the actuating arm 17 is operatively engaged between spaced upstandings fingers 22—22 of a slide plate 23 which is constrained for reciprocation on the attachment frame by a pair of slot and pin connections therewith, as indicated at 24. Pivoted at 25 to the slide plate is a pawl 26 which is biased by a spring 27 into engagement with the teeth of a ratchet wheel 28 fast on a cam shaft 29 journaled vertically in the attachment frame. In timed relation with the reciprocation of the needle bar, step-by-step rotary motion is thus imparted

to a pattern cam 30 which is carried by and keyed to turn with the cam shaft 29.

The pattern cam is formed with a closed sinuous cam groove 31, it being understood that the configuration of the cam groove determines the pattern of work-jogging movements effected by the attachment. The cam groove, therefore, may be of any selected configuration to produce with the attachment any desired pattern of zigzag stitches.

This cam groove is tracked by a follower roller 32 which is journaled on follower pin 33 fixed to one extremity of a work-jogging member 34 which at its opposite extremity carries a work-engaging foot 35 formed with a laterally elongated needle-accommodating aperture 36. The work-jogging member 34 is formed with an aperture 37 which is elongated longitudinally of the work-jogging member and is adapted to accommodate a fulcrum pin, indicated generally as 38, which is carried by a slider 39 confined to move along the attachment frame. The slider may be shifted along the frame by means of a finger grip 40 to carry the fulcrum pin to any selected position along the aperture 37. A thumb screw 41 which passes through a slot 42 in the slider and is threaded into the frame provides a means by which the slider may be clamped in any selected position of adjustment. Thus, by changing the ratio of the lever arms presented by the shank member, the extent of work-jogging movement or bight which the work-jogging foot partakes may be adjusted. The slider 39, however, when clamped in any selected position of adjustment becomes, for all intents and purposes, a part of the attachment frame, and the fulcrum pin 38, therefore, may be considered as being secured to the attachment frame.

Pivoted on the cam follower pin 33 is one extremity of an anchor link 43 of which the opposite extremity is pivoted to the attachment frame by means of a pivot pin, indicated generally as 44.

The quality of the pattern of stitches which will be formed with the use of the above described attachment depends primarily upon the degree of control which the work-engaging foot 35 can maintain over the work fabric at the stitching point. Any puckering or shifting of the work fabric with respect to the foot during the work-jogging motion will detract from the quality of the stitching and from this standpoint it is advantageous to form the needle-accommodating aperture 36 no bigger than is absolutely necessary to accommodate the widest bight of which the attachment is capable. To make the aperture 36 any larger would unduly increase the area of unsupported fabric adjacent to the needle and would thus diminish the control by the work-engaging foot over the work fabrics.

It will be apparent that to tolerate a needle-accommodating aperture 36 of minimum dimensions, the work-engaging foot must be positioned when the attachment is applied to a sewing machine such that the path of reciprocation of the sewing machine needle will be centered in the aperture 36, that is, centered not only between the front and rear sidewalls of the laterally elongated aperture 36 but centered so that at the widest bight the needle does not strike the work-engaging foot at either end of the elongated aperture 36.

To manufacture each of the attachment parts to sufficiently close tolerances that upon assembly centering of the needle-accommodating aperture could be assured would be prohibitively expensive. It should be borne in mind that the dimensions of many of the parts contribute to dictate the needle-accommodating aperture position and that the tolerances may be cumulative.

In the past, it has been the practice physically to distort the assembled attachment until the requisite alignment is attained. This procedure has several disadvantages in

that it is not always possible to control the distortion so that it sometimes adversely affects attachment operation. Furthermore, a surprising high degree of skill is necessary for such adjustment by distortion so that it not only results in inefficient utilization of manpower but sharply increases labor costs in production.

The present invention provides a means whereby the work-engaging foot may be aligned as a simple adjunct to the assembly of the parts without distortion of the parts and in a manner which does not require special capabilities on the part of an assembly worker.

In the present invention both the fulcrum pin 38 and the anchor link pivot pin 44 are provided in a novel manner with eccentric portions which when positioned during assembly provide for a perfect alignment of the work-engaging foot with respect to the path of reciprocation of the sewing machine needle.

Referring more particularly to Fig. 4, the fulcrum pin 38 is provided with a shank portion 45 which is eccentrically disposed with respect to the axis of the remainder of the parts of the fulcrum pin. The eccentric portion 45 is disposed in engagement with the slot 37 formed longitudinally in the work-jogging member 34. In the preferred embodiment of the drawings, the fulcrum pin 38 takes the form of a rivet and is formed with a shank portion 47 adapted to enter an aperture 48 formed in the slider 39 and to be secured thereto by having the shank portion 47 upset in the usual fashion of a rivet. The fulcrum pin 38 is formed with an enlarged head 49 formed with a screw driver slot 50 so that the pin may be turned in assembly to center the aperture 36 in a lateral direction with respect to the path of needle reciprocation. The slider aperture 48 is formed with a plurality of radially extending notches 51—51, Fig. 4, so that upon being upset the shank portion 47 of the fulcrum pin will be locked in the particular selected angular position with respect to the slider and hence with respect to the attachment frame. As to this form of rotational interlock between the fulcrum pin and the attachment frame, I do not desire to be limited to the notched construction which is illustrated and it will be understood that any form of aperture 48 which is noncircular will serve this purpose.

Since the fulcrum pin 38 serves to dictate the bight or the extent of lateral movement of the stitch pattern, there will be a difference noticeable at the smallest and largest bight settings from one attachment to the next unless the eccentricity of the shank portion 45 of the fulcrum pin is consistently made to occur on the same side of the axis of the fulcrum pin. For this purpose, a curved notch 52 is formed in the fulcrum pin head 49, the notch being located at a point opposite the point of maximum eccentricity of the eccentric portion 45. By arbitrarily positioning the indicia 52 consistently either to the front of the attachment, as illustrated in the drawings, or consistently to the rear, then all of the attachments so made will have consistene bight settings and bight ranges.

In Fig. 3 is illustrated the construction of the anchor link pivot pin 44. The pin 44 is formed with a head portion 53 having a screw driver slot 54 and a shank portion 55 which together with the head 53 is disposed eccentrically with respect to a shank portion 56 which is adapted to enter an aperture 57 in the attachment frame and to be secured thereto by having the shank portion 56 upset. A washer 58 and the anchor link 43 are disposed in engagement with the eccentric shank portion 55 of the pivot pin 44 and the aperture 57 of the attachment frame is formed with radial notches 59 or amy be otherwise made noncircular so that the pivot pin will be locked with respect to the frame in the particular selected angular position when the shank portion 56 is upset. The eccentric pivot pin 44 thereby provides a means for centering the sides of the needle-accommodating slot with respect to the path of needle reciprocation.

Having thus described the nature of the invention, what I claim herein is:

1. A work-jogging attachment for a sewing machine having an endwise reciprocatory needle, said attachment having an attachment frame adapted to be secured to said sewing machine, a movable work-jogging member in the form of a lever, a rivet secured with respect to said attachment frame and associated with said work-jogging member to provide a fulcrum for movement thereof, mechanism carried by said attachment frame for moving said work-jogging member about said fulcrum, a work-engaging foot carried by said work-jogging member and having a needle-accommodating aperture formed therein, and means for centering said aperture with respect to the path of reciprocation of said sewing machine needle, comprising an eccentric portion formed on said fulcrum rivet, said eccentric portion being disposed in operative engagement with said work-jogging member, a shank portion formed on said rivet adapted to be upset to secure said rivet with respect to said attachment frame, said attachment frame being formed with a noncircular rivet accommodating aperture whereby upsetting of said rivet shank will secure said fulcrum pin permanently in any selected angular position with respect to said attachment frame.

2. A work-jogging attachment for a sewing machine as set forth in claim 1 in which the fulcrum pin is provided with indicia marking the point of maximum eccentricity of said eccentric portion.

3. A work-jogging attachment for a sewing machine having an endwise reciprocatory needle, said attachment having an attachment frame adapted to be secured to said sewing machine, a work-jogging member, a work-engaging foot carried by said member, said work-engaging foot being formed with a needle-accommodating aperture, a fulcrum pin secured to said frame, said work-jogging member being formed with a fulcrum pin accommodating aperture which is elongated longitudinally of said member, mechanism carried by said attachment frame for vibrating said work-jogging member laterally, an anchor link pivotally connected at one extremity to said work-jogging member, a pin secured to said attachment frame and pivotally connected with the other extremity of said anchor link to constrain said work-jogging member longitudinally, and means for centering said needle-accommodating aperture with respect to the path of reciprocation of said needle comprising an eccentric portion formed on said pivot pin, said eccentric portion being disposed in pivotal engagement with said anchor link, and means for securing said pivot pin in any selected angular position with respect to said attachement frame.

4. A work-jogging attachment for a sewing machine as set forth in claim 3 in which said pivot pin takes the form of a rivet, a shank portion formed on said rivet adapted to be upset to secure said rivet with respect to said attachment frame, said attachment frame being formed with a noncircular rivet accommodating aperture whereby upsetting of said rivet shank will secure said pivot pin permanently in any selected angular position with respect to said attachment frame.

5. A work-jogging attachment as set forth in claim 3 in which both said pivot pin and said fulcrum pin are provided with eccentric portions, the eccentric portion of said fulcrum pin being disposed in operative engagement with said work-jogging member, the eccentric portion of said pivot pin being disposed in pivotal engagement with said anchor link, and means for securing each of said pins in any selected angular position with respect to said attachment frame.

6. A work-jogging attachment for a sewing machine having an endwise reciprocatory needle, said attachment having an attachment frame adapted to be secured to said sewing machine, a work-jogging member, a work-engaging foot carried by said member, said work-engaging foot being formed with a needle-accommodating aperture, a fulcrum member carried by said frame, said work-

jogging member being formed with a fulcrum member accommodating aperture which is elongated longitudinally of said work-jogging member, mechanism carried by said attachment frame for moving said work-jogging member about said fulcrum member, an anchor link pivotally connected at one extremity to said work-jogging member, an anchor link securing member carried by said frame and connected with the other extremity of said anchor link, and a first and second centering means, said first means being interposed between said fulcrum member and said frame, said second means being interposed between said anchor link securing member and said frame,

each of said centering means having capacity to permit selective positioning of said members for centering said needle-accommodating aperture with respect to the path of reciprocation of said needle.

References Cited in the file of this patent

UNITED STATES PATENTS

678,908	Rose et al.	July 23, 1901
740,298	Moore	Sept. 29, 1903
2,660,138	Russell	Nov. 24, 1953