

- [54] **DRIVING GEAR FOR THE LOOPER OF A CHAIN STITCH SEWING MACHINE** 2,351,831 6/1944 Muecke 112/200
 2,397,336 3/1946 Clayton 112/200
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 3,112,720 12/1963 Bono 112/200

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[56] References Cited

UNITED STATES PATENTS

1,915,923 6/1933 Clayton 112/200

[57] ABSTRACT

A drive mechanism for the looper of a chain stitch sewing machine is of simplified construction comprising a drive shaft with a crank and an eccentric. A rocker element is secured to a looper carrying axle and is arranged to be rocked by said crank to produce rotary reciprocating movement of said shaft and the eccentric is arranged to produce linear reciprocating movement of said axle, so that a required elliptical motion of the loopers on said axle is obtained.

7 Claims, 3 Drawing Figures

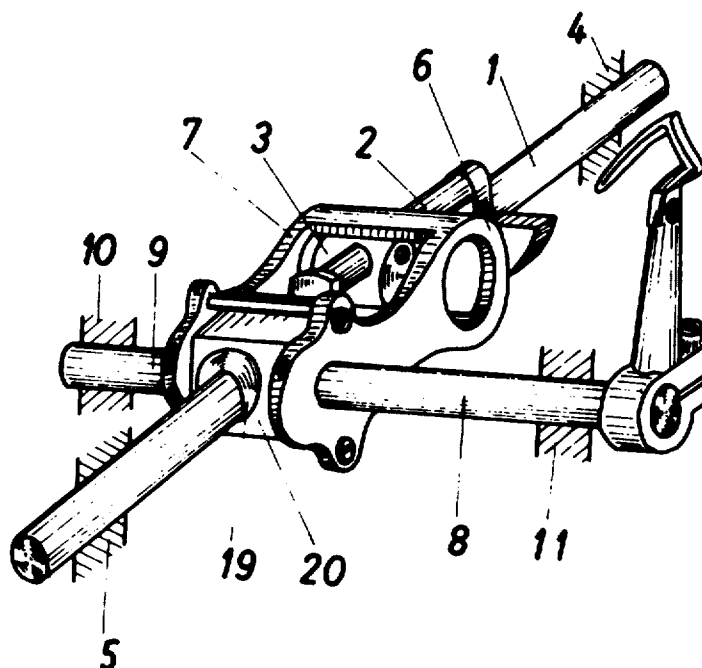


Fig. 1

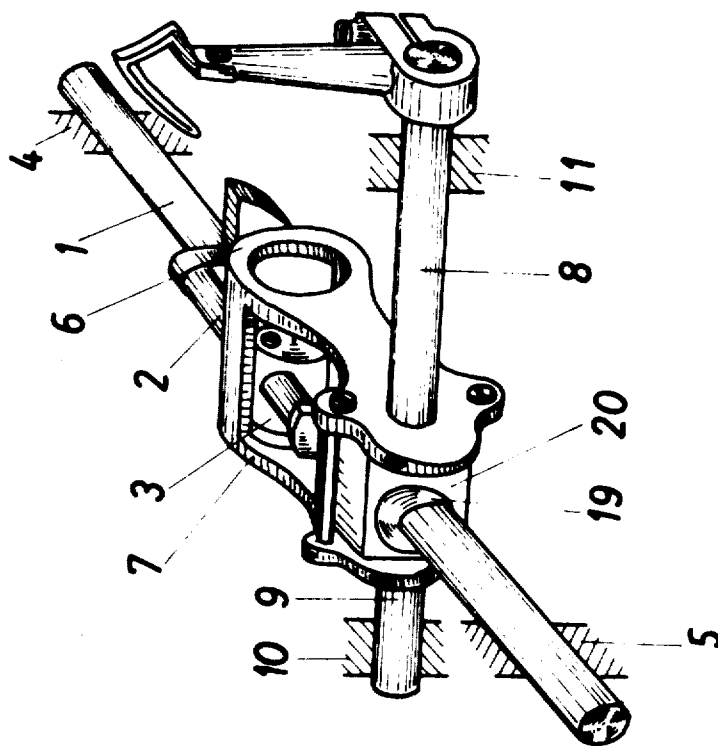


Fig. 2

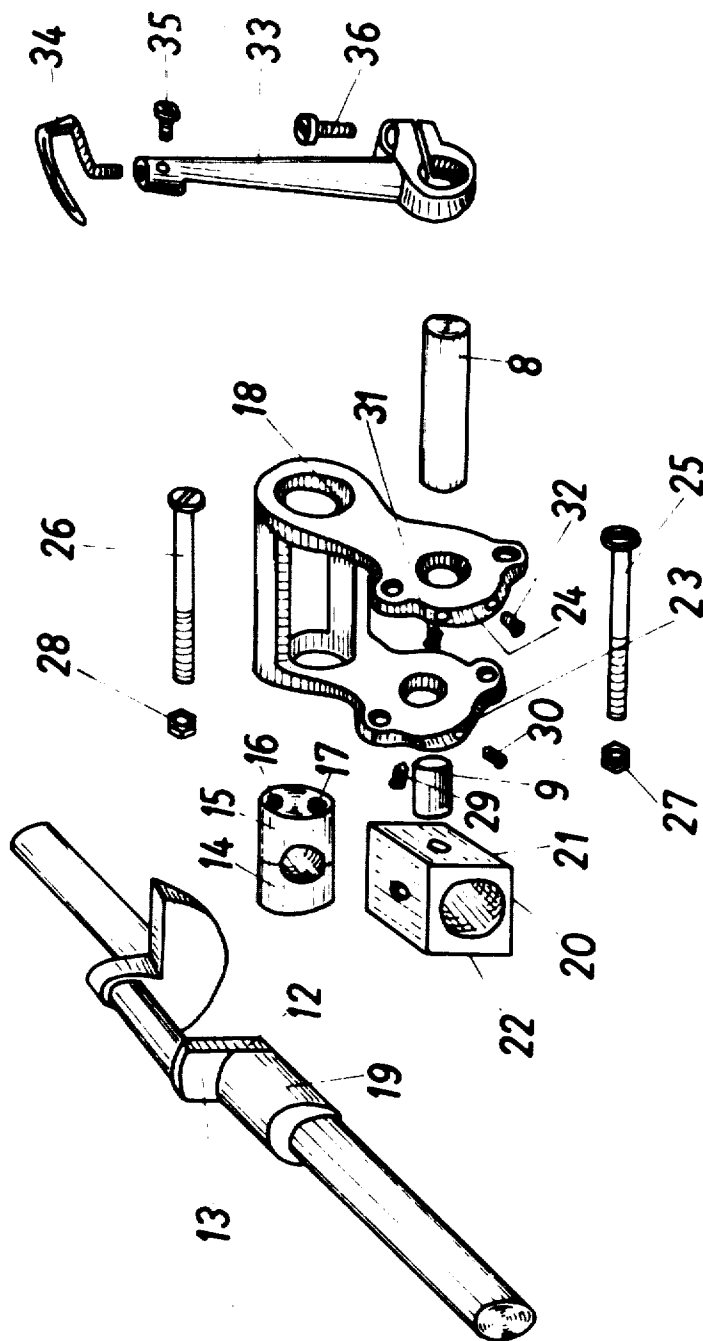
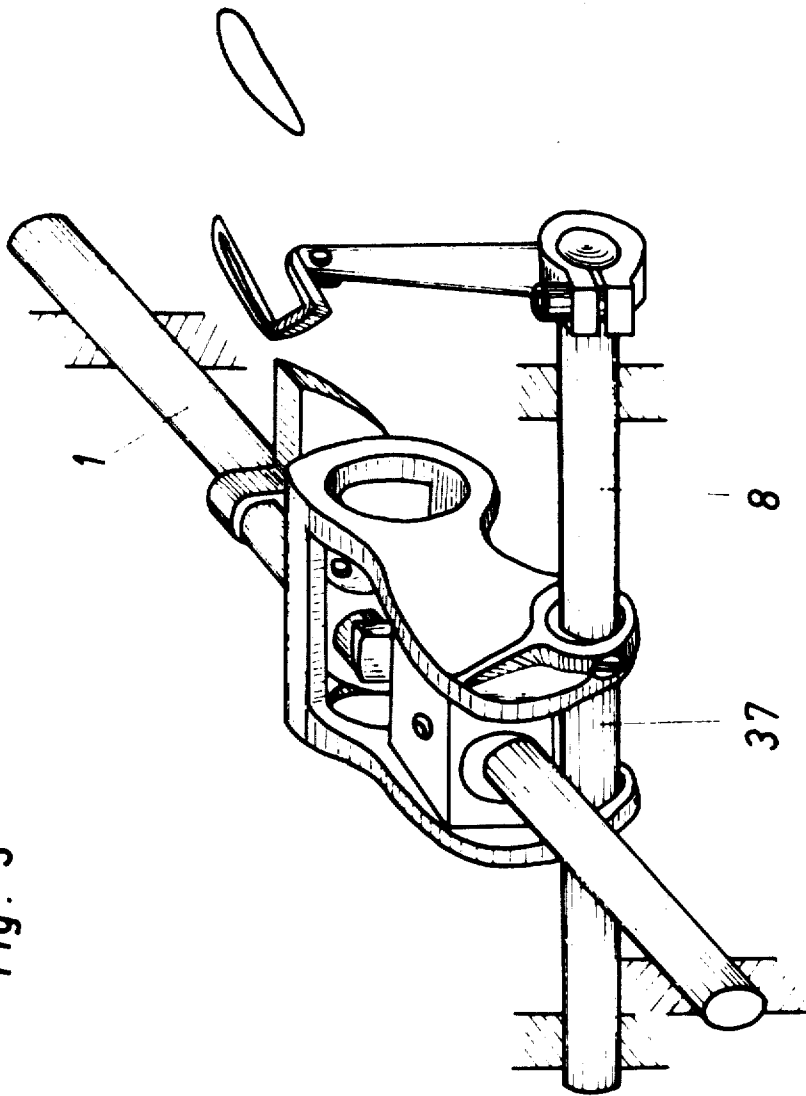


Fig. 3



DRIVING GEAR FOR THE LOOPER OF A CHAIN STITCH SEWING MACHINE

This invention is concerned with a driving mechanism for the looper of a chain stitch sewing machine. The known mechanisms for achieving the required elliptical movement of the looper have been complex and have involved a considerable number of parts moving relatively to each other and this results in great inertia forces at high speed operation. Another disadvantage of the utilization of a great number of parts is inaccuracies and variations in the motion of the looper element, which results from deformation of the elements of the drive because of the high inertial forces on that drive and by the inherent play between the elements of the drive. This means that the formation of the seam may not be as accurate as desired and that the sewing speed is limited.

The present invention seeks to provide a simple and effective drive mechanism for the looper of a chain stitch sewing machine which avoids or limits these disadvantages.

Embodiments of this invention are illustrated in the accompanying drawings in which:

FIG. 1 is a perspective view of a drive mechanism according to this invention;

FIG. 2 is an exploded view showing the various elements of the mechanism of FIG. 1; and

FIG. 3 is a perspective view of an alternative form of drive mechanism.

The embodiment of FIGS. 1 and 2 comprises a looper drive shaft 1 which has a crank 2 with crank webs and a crank pin, the crank web most remote from the observer of FIG. 1 having a counter-weight 6. The drive shaft is mounted in bearings schematically illustrated at 4 and 5.

Mounted for rotation on the pin of the crank is a cylindrical slide 3. The slide 3 is mounted for sliding movement in a cylindrical slideway 18 at the web of a generally U-shaped rocker element 7. It is to be noted that the crank pin of the crank extends through windows formed in the web portion of the rocker.

For assembly of the slide 3 upon the crank pin, the slide is formed as two parts 14 and 15 as shown in FIG. 2, those two parts being held together by pan head screws 16 and 17. To facilitate assembly of the rocker, the crank web closest to an observer in FIGS. 1 and 2 is provided with flattened surfaces 12 and 13 to pass through the window in the web of the rocker element.

It is to be noted that adjacent to the crank web, the drive shaft has an eccentric portion 19 upon which is arranged a coupling or slide element 20. The surfaces 21 and 22 are disposed to bear upon the faces 23 and 24 of the arms of the rocker element 7, there being sliding movement between these adjacent surfaces during the rotation of the eccentric 19.

To support the arms of the U-shaped rocker element, screws 25 and 26 extend across the space between the arms and are secured by nuts 27 and 28. This provides the appropriate rigidity for the structure.

The rocker is secured to the looper axle 8 and to extension bolt 9 by means of screws of 29, 30, 31 and 32, and holes are formed in the ends of the arms of the rocker element in which the axle 8 and bolt 9 are disposed.

A looper holder 33 is secured upon axle 8 by means of screw 36 and a looper 34 is secured to holder 33 by means of screw 35.

In the embodiment of FIG. 1, as the looper drive shaft 1 is turned, the crank causes reciprocation of the slider 3 within the slideway of the rocker element 7 so that the rocker is reciprocated, turning the axle 8 back and forth. Additionally, the eccentric 9 causes the coupler 20 to reciprocate the axle 8 axially so that the looper describes the required elliptical path for stitch formation.

The embodiment of FIG. 3 in the drawings is largely similar to that of FIGS. 1 and 2 except that the axis of the drive shaft 1 does not intersect the axis of the looper axle 8. Additionally, the looper axle 8 has an eccentric portion 37 upon which the rocker element is mounted. This results in a distorted path of the looper as shown at P in FIG. 3. The path has semi-major axes of unequal length and with this arrangement, improved stitch formation when catching the needle thread loop, is achieved.

It will be appreciated that adjustment of the cam 37 provides for variation in the stroke in the movement of the looper.

What is claimed is:

1. In a chain stitch sewing machine, a looper driving gear comprising a drive shaft, a crank on said drive shaft, a slide pivotally mounted on a crank pin of said crank for rotation relative thereto, said slide being slidably mounted in a slideway of a rocker element, said rocker element being secured to a looper axle normal to the axis of the drive shaft and parallel to said slideway to impart rotary reciprocating motion to said axle, an eccentric on said drive shaft, a coupling element rotatable on said eccentric and coupling said eccentric to said rocker to impart reciprocating movement to said rocker and said looper axle in the direction of the axis of that axle, the crank and eccentric being constituted as means imparting elliptical movement to a looper element secured to said axle.

2. Apparatus as claimed in claim 1, wherein said slide and slideway are correspondingly cylindrical.

3. Apparatus as claimed in claim 1, wherein the axes of the drive shaft and of said looper axle intersect.

4. Apparatus as claimed in claim 1, wherein said rocker element comprises a generally U-shaped member having arm portions and a web portion connecting said arm portions, said rocker element being secured to said axle at distal ends of the arm portions thereof and wherein said slideway is defined by said web portion.

5. Apparatus as claimed in claim 4, wherein said web portion comprises window means through which said crank pin extends.

6. Apparatus as claimed in claim 4, wherein said coupling element comprises an element disposed between the arms of said rocker element and mounted upon said eccentric and having a sliding contact with the arms of the coupler element and being effective to shift the coupler element and the axle in the longitudinal direction of said axle.

7. Apparatus as claimed in claim 1 in which said rocker element is fixed to an eccentric portion of said axle.

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