

- [54] **ADJUSTABLE ECCENTRIC FOR SEWING MACHINES**
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- [21] Appl. No.: **416,145**

2,950,695	8/1960	Benink et al.....	112/200
2,958,301	11/1960	Medynski.....	112/199
3,285,210	11/1966	Tretow et al.	112/199
3,301,207	1/1967	Reeber et al.	112/200

FOREIGN PATENTS OR APPLICATIONS

474,710	3/1929	Germany	112/200
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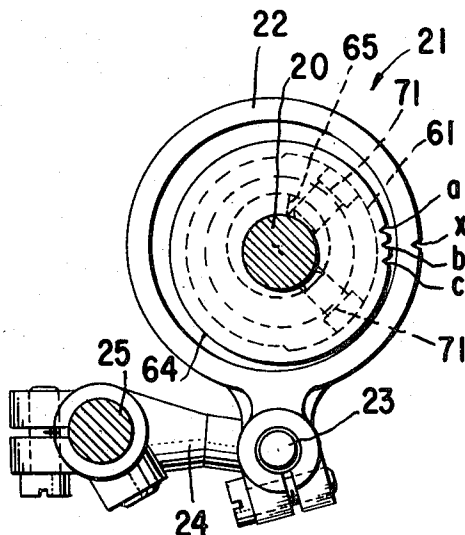
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Attorney, Agent, or Firm—Robert E. Smith; Marshall J. Breen; C. A. Williams, Jr.

- [52] U.S. Cl. 112/200, 74/571 M
- [51] Int. Cl. D05b 57/02
- [58] Field of Search 112/165, 166, 182, 190, 112/197, 199, 200, 209, 210, 211; 74/571 R, 571 M

[57] **ABSTRACT**
 A sewing machine stitch forming instrumentality, specifically a chain stitch sewing machine loop taker, is disclosed to which oscillatory movement is imparted by an eccentric unit which includes provision for adjustment by the operator of both the eccentricity and the timing of the adjustable eccentric unit by relative rotation of the parts.

- [56] **References Cited**
- UNITED STATES PATENTS**
- 324,639 8/1885 Beardslee..... 112/200 X

1 Claim, 6 Drawing Figures



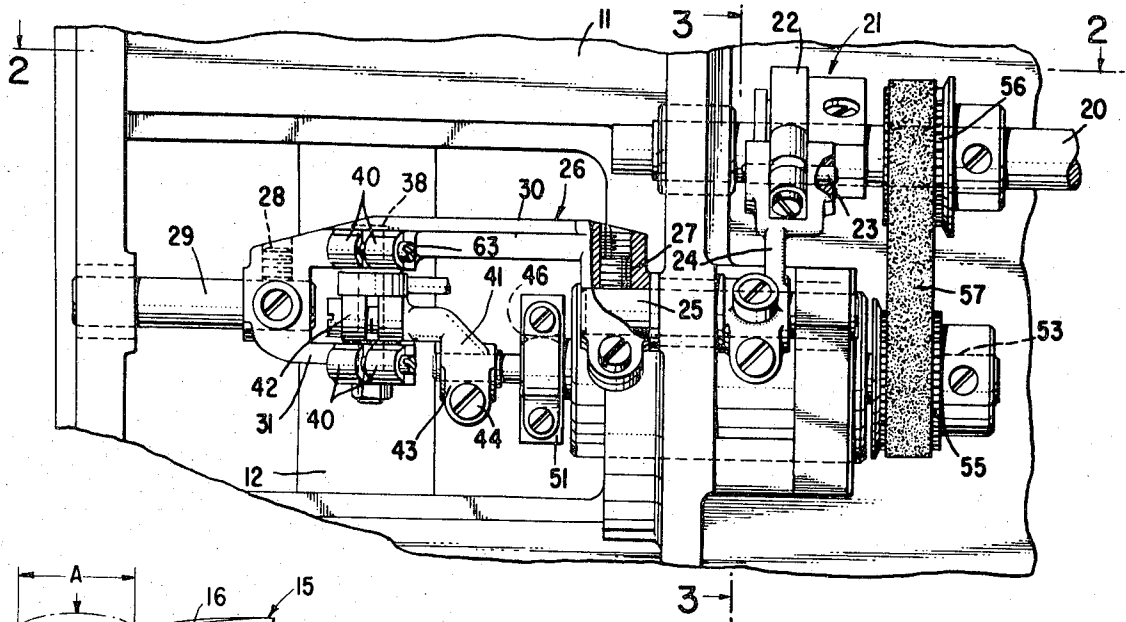


Fig. 1

Fig. 5

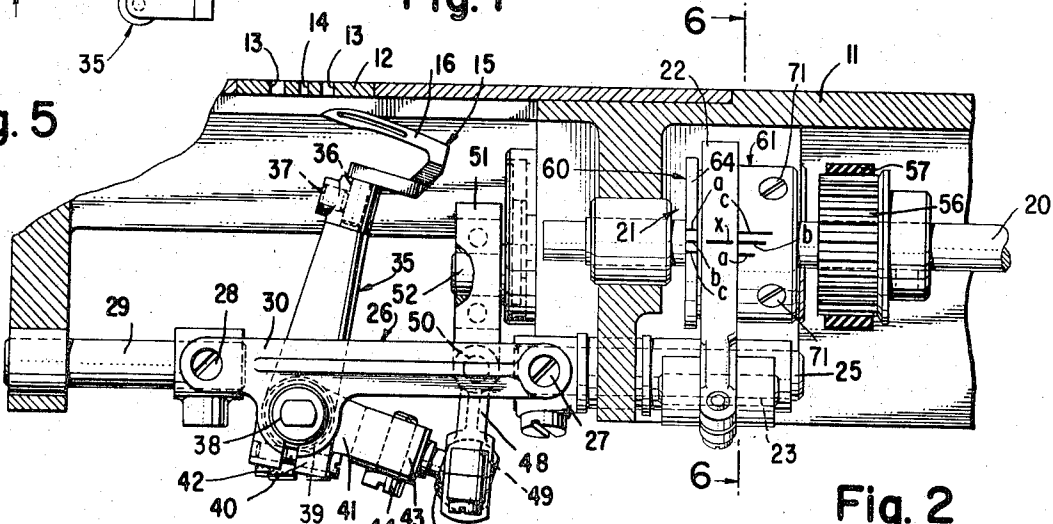


Fig. 2

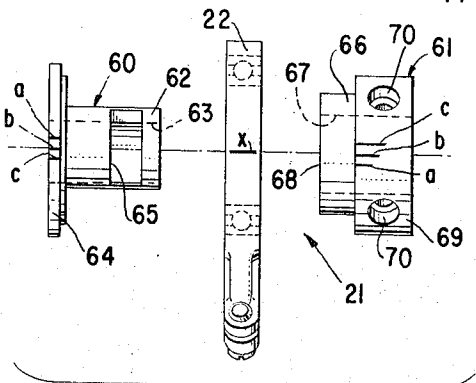


Fig. 4

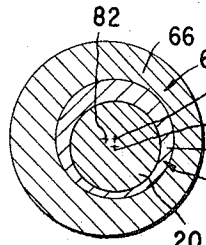


Fig. 6

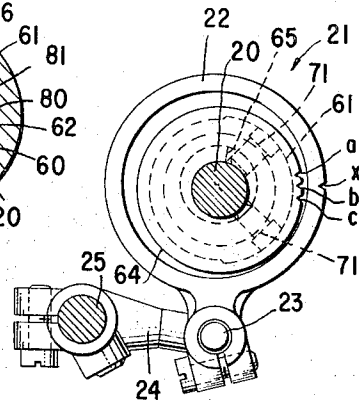


Fig. 3

ADJUSTABLE ECCENTRIC FOR SEWING MACHINES

BACKGROUND OF THE INVENTION

Prior adjustable eccentric constructions in which relative rotation of parts is utilized, such as disclosed in the U.S. Pat. No. 1,605,937, Nov. 9, 1926, Greib, have the defect that adjustment of eccentricity disturbs the timing of the eccentric unit. Prior adjustable eccentrics in which a relative sliding movement between the parts is employed to adjust eccentricity, such as disclosed in the U.S. Pat. No. 2,453,072, Nov. 2, 1948 of R. E. Johnson do not occasion a timing change but fabrication of these sliding constructions involve costly and difficult machining operations which restrict the usefulness of these devices.

BRIEF SUMMARY OF THE INVENTION

It is an object of this invention to provide an adjustable eccentric unit useful to drive an oscillatory stitch forming instrumentality of a sewing machine, such as a chain stitch loop taker or the like, in which the eccentric is composed of angularly adjustable parts which may thus be machined accurately with a minimum of expense and arranged in a unique relationship by which both the eccentricity and the timing of the assembled adjustable eccentric unit may be conveniently adjusted. This object of the invention is attained by means of an adjustable eccentric construction involving telescopic inner and outer eccentric members each formed with a radial flange between which flanges an eccentric embracing pitman is constrained. Indicia carried on the pitman and on each of the radial flanges of the inner and outer eccentric members denote the eccentricity and the timing of the assembled adjustable eccentric unit.

DESCRIPTION OF THE DRAWINGS

In the accompanying drawing of a preferred embodiment of the invention:

FIG. 1 shows a bottom plan view of a chain stitch sewing machine having a looper mechanism which is driven by an adjustable eccentric made in accordance with this invention,

FIG. 2 is a longitudinal cross sectional view of the chain stitch sewing machine of FIG. 1 taken substantially along line 2—2 of FIG. 1,

FIG. 3 is a transverse cross sectional view taken substantially along line 3—3 of FIG. 1 showing the adjustable eccentric and the pitman driven thereby,

FIG. 4 is a disassembled elevational view of the adjustable eccentric of this invention including the eccentric embracing pitman,

FIG. 5 is an enlarged top view of the loop taker together with a representation of the path of movement of the loop taker and

FIG. 6 is an enlarged cross sectional view taken along line 6—6 of FIG. 2 showing the eccentric members assembled on the drive shaft therefor.

DESCRIPTION OF THE INVENTION

In the accompanying drawing, 11 indicates a work supporting bed portion of a sewing machine frame in which is positioned a work supporting throat plate 12 having apertures 13 for a work feeding mechanism (not shown), and an aperture 14 through which a sewing machine needle (not shown) is adapted to penetrate in

the formation of stitches. Beneath the throat plate a chain stitch thread carrying looper 15 is situated including a blade 16 which must be moved endwise across the path of needle reciprocation to seize and shed loops of thread from the needle. The looper must also be shiftably oscillated sideways to avoid the needle alternately on opposite sides thereof. The four-motion path which the looper is required to execute is well known in the sewing machine art in machines for sewing two thread chain stitches (Federal stitch type 401).

As shown in FIGS. 1 and 3, a bed shaft 20 is journaled in the bed 11 and serves to impart the required motion to the looper. The bed shaft carries an adjustable eccentric assembly indicated generally at 21 embraced by a pitman 22 which is connected by a pivot pin 23 to a rock arm 24 secured to a rock shaft 25 which is journaled in the sewing machine bed 11 for imparting the looper avoiding motion. The eccentric assembly 21 forms a part of this invention and will be described in greater detail hereinbelow. A rock frame 26, illustrated in FIGS. 1 and 2, is secured by a set screw 27 to the rock shaft 25 so as to partake of the oscillatory movement of the rock shaft 25. The rock frame 26 is also secured by a set screw 28 to a supporting pivot pin 29 also journaled in the sewing machine bed. The rock frame 26 is formed with spaced arms 30 and 31 between which is journaled a looper carrier 35 in which looper carrier the shank 36 of the looper 15 is secured by a set screw 37.

For imparting loop seizing and shedding motion to the looper, the looper carrier 35 is secured to a pivot stud 38 which is journaled in bushings 39 gripped by split clamp portions 40 of the rock frame spaced arms 30 and 31. The looper carrier 35 is associated with a lever arm 41 which may be secured in selected angular relationship to the looper carrier 35 as well as secured to the pivot stud 38 by a split clamp 42. Secured by a split clamp 43 and a clamp screw 44 at a free extremity of the lever arm 41 is a ball 46. A link 48 having a spherical socket 49 embracing the ball 46 is pivotally connected by a pivot pin 50 to a pitman 51 embracing a crank pin 52 on a stud shaft 53 which is journaled in the machine bed 11. Both the stud shaft 53 and the bed shaft 20 have secured thereon sprocket wheels 55 and 56, respectively, which are connected by a timing belt 57.

By the above described separate driving trains from the bed shaft 20 the loop taker movement in mutually perpendicular directions endwise and sidewise of the looper blade are accommodated, and it will be understood that the crank pin 52 imparts endwise movement to the looper blade as indicated at A in FIG. 5, while the eccentric assembly 21 imparts sidewise movement to the looper blade as indicated at B in FIG. 5.

Referring now to FIGS. 3, 4 and 6, the adjustable eccentric assembly 21 of this invention will now be described in detail. The adjustable eccentric is formed by an assembly of an inner eccentric member 60 and an outer eccentric member 61 arranged telescopically one upon the other on the bed shaft 20. The inner eccentric member 60 is formed with a sleeve portion 62 having an eccentric shaft-accommodating bore 63. At one extremity, the sleeve portion 62 is formed with a radial flange 64, while at the other extremity the sleeve portion 62 is formed with a radial slot 65 which opens onto the bore 63.

The outer eccentric member 61 is formed with a sleeve portion 66 formed with an eccentric bore 67 adapted to embrace the sleeve portion 62 of the inner eccentric member 60. The sleeve portion 66 of the outer eccentric member is formed with a free extremity 68 adapted to abut the flange 64 of the inner eccentric member, and the sleeve portion 66 is formed at the opposite extremity with a radial flange 69. The flange 69 is formed radially with tapped set screw accommodating holes 70 through which set screws 71 may be accommodated for fastening the outer eccentric member in adjusted angular position on the bed shaft 20. The set screws 71 preferably pass with clearance through the slot 65 in the inner eccentric member 60 but lock both inner and outer eccentric members in secured position because of the eccentricity of the bores 63 and 67.

As shown in FIG. 6, the axis of the shaft 20 is indicated at 80 whereas the central axis of the inner eccentric member sleeve portion 62 is indicated at 81 and the axis of the sleeve portion 66 of the outer eccentric member 61 is indicated at 82. It will be appreciated that angular movement of the inner eccentric member relatively to the bed shaft 20 and relatively to the outer eccentric member 61 will change the eccentricity of the adjustable eccentric unit 21. An angular shift of the outer eccentric member 61 with respect to the remainder of the unit will influence a timing shift of the adjustable eccentric unit 21. Both eccentric and timing adjustments may be made when the set screws 71 are loosened, and both eccentric and timing adjustments are locked when the set screws 71 are tightened.

To facilitate adjustment of the adjustable eccentric unit 21 of this invention, a reference mark *x* is formed transversely across the pitman 22 which embraces the adjustable eccentric. The radial flange 64 of the inner eccentric member 60 is formed with indicia denoted *a, b, c*, in the drawing and which are cooperative with the reference mark *x* on the pitman to denote different eccentricities which the stitch forming instrumentality might frequently require.

In order that such adjustments of eccentricity can be made without necessitating undesirable changes in timing of the eccentricity, the radial flange 69 of the outer eccentric member 61 may similarly be formed with indicia denoted *a, b, c*, in the drawing which are cooperative with the reference mark *x* on the pitman to denote those settings of the outer eccentric member 61 whereby for each eccentricity adjustment setting uniformity of timing may be maintained. The indicia *a, b, c* for instance, may be chosen to denote the appropriate eccentricity and timing adjustments to suit small, medium and large diameter needles, respectively. As shown in FIG. 2, for instance, the setting for medium diameter needles is shown in which the indicium marked B on each of the flanges 64 and 69 has been set opposite the reference mark *x* on the pitman 22. With the adjustable eccentric of the present invention, therefore, highly accurate settings for eccentricity and timing may be made without resort to expensive, complicated adjustable eccentric constructions.

Having set forth the nature of the invention, what is claimed herein is:

1. In a sewing machine having a rotary drive shaft, an oscillatory stitch forming mechanism, an adjustable throw eccentric carried on said drive shaft, and a pitman embracing said adjustable throw eccentric and operatively connected to said stitch forming instrumentality, said adjustable throw eccentric comprising telescopically arranged inner and outer eccentric members each formed with a radial flange, the flanges extending one on each side of said pitman, fastening means carried by the radial flange of said outer eccentric member and engageable with said drive shaft to lock said adjustable eccentric members in selected position on said shaft, indicia carried on said pitman and on the radial flange of said inner eccentric member denoting the eccentricity of said adjustable eccentric, and cooperating indicia carried on said pitman and on the radial flange of said outer eccentric member denoting the timing of said adjustable eccentric.

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