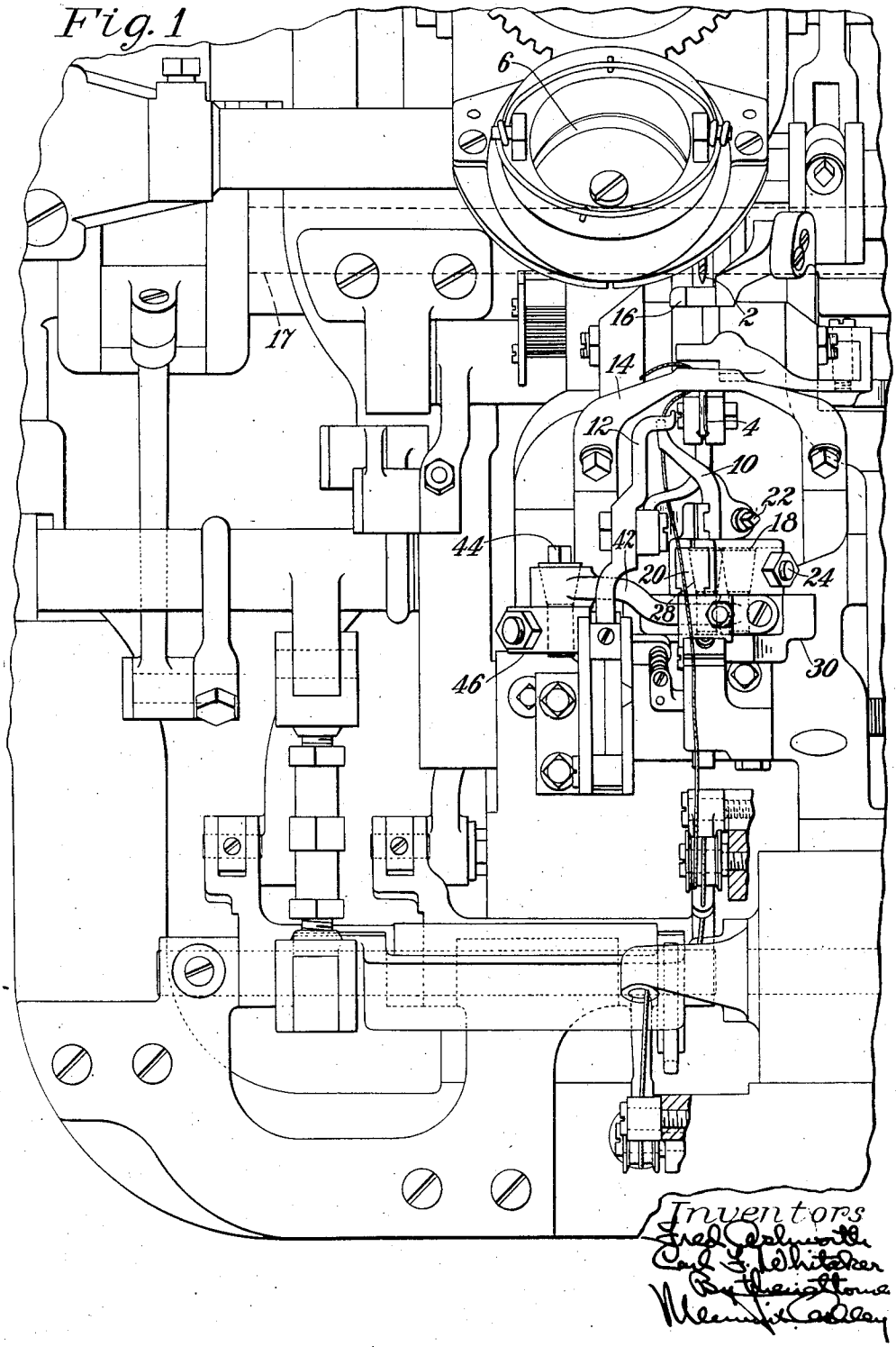
Aug. 1, 1944. F. ASHWORTH ET AL 2,354,730

SHOE SEWING MACHINE

Original Filed Feb. 2, 1942 2 Sheets-Sheet 1

Fig. 1




Inventors
Fred Ashworth
Carl E. Whitaker
By Theirattorneys
Merriam & Marshall

Aug. 1, 1944. F. ASHWORTH ET AL 2,354,730

SHOE SEWING MACHINE

Original Filed Feb. 2, 1942 2 Sheets-Sheet 2

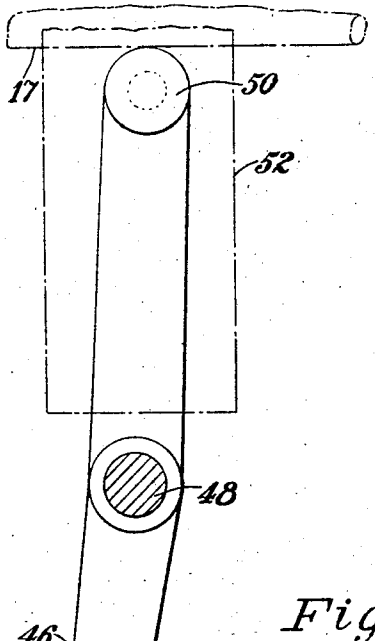



Fig. 2

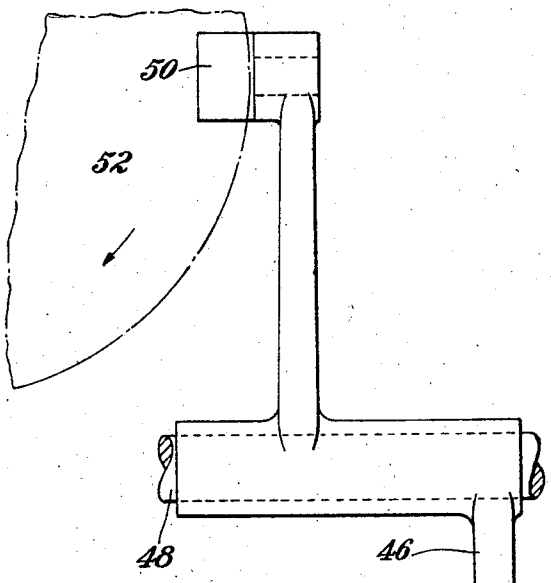
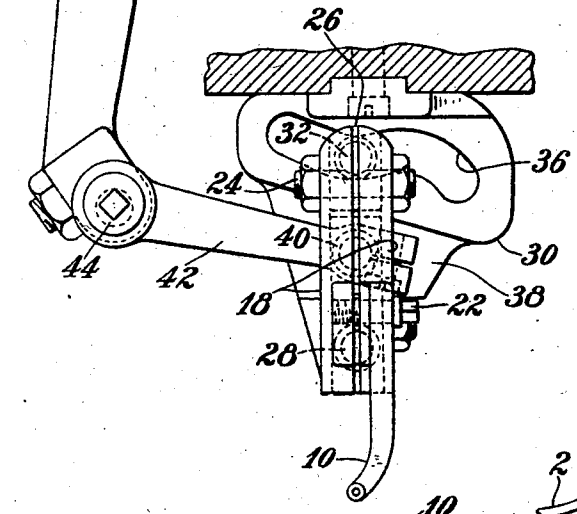



Fig. 3



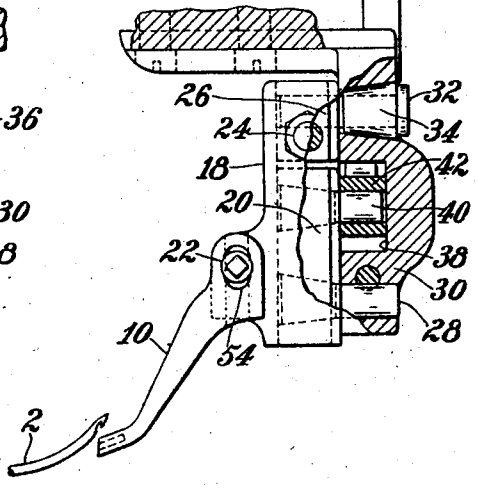
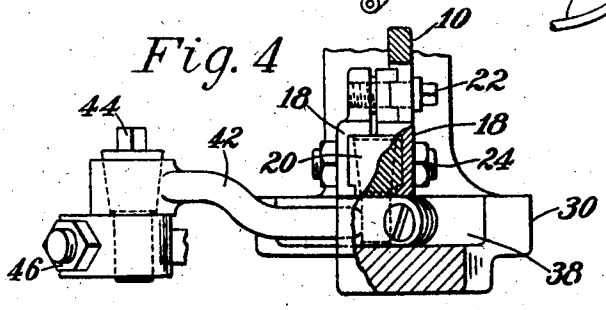




Fig. 4




Inventors

Patented Aug. 1, 1944 2,354,730

# UNITED STATES PATENT OFFICE

2,354,730

## SHOE SEWING MACHINE

Fred Ashworth, Wenham, and Carl F. Whitaker, Beverly, Mass., assignors to United Shoe Machinery Corporation, Flemington, N. J., a corporation of New Jersey

Original application February 2, 1942, Serial No. 429,206. Divided and this application May 29, 1943, Serial No. 488,966

4 Claims. (Cl. 112—55)

The present invention relates to improvements in shoe sewing machines and is herein illustrated as embodied in a high speed lockstitch sewing machine of the hooked needle type, as disclosed in the present inventors' United States Letters Patent No. 2,271,611 of February 3, 1942, and constructed and arranged to sew the outsole and welted upper of a Goodyear welt shoe.

The objects of the present invention are, in general, to simplify and improve the looper actuating mechanisms of an outsole shoe sewing machine in a manner to insure accurate formation of stitches both in length and in uniformity with which they are set in the substance of an outsole where the machine is operated at high or moderate speeds and to reduce the effects of wear and improper adjustments resulting in vibration, lost motion in the parts, or other undesirable conditions.

With these and other objects in view, a feature of the present invention relates to the provision in a high speed outsole shoe stitching machine, of mechanism for supporting and actuating a looper for a hooked needle to move the looper from one side of the needle to the other along a curving path generally in the line of feed comprising an arm pivoted on the frame of the machine, a looper carrier slidable on the arm, and means for shifting the carrier along the arm to impart a forward and rearward component of movement to the looper and for swinging the arm to impart sidewise movement to the looper. As hereinafter illustrated, the means for shifting the carrier comprises an S-shaped cam acting during swinging movements of the arm. With such construction, the support for the cam also provides a mounting for the pivot of the arm on which the looper carrier slides. In order to take up wear in the connections, the principal wearing surfaces of the pivots for the moving parts are formed with conical shape to enable proper fit of the pivots in the bearings, regardless of the amount of wear.

Other features of the invention consist in the devices, combinations and arrangements of parts hereinafter described and claimed, the advantages of which will readily be understood from the following description taken in connection with the accompanying drawings illustrating one embodiment of the invention.

In the drawings,

Fig. 1 is a view in front elevation of a part of an outsole shoe sewing machine embodying the features of the present invention;

Fig. 2 is a plan view of the looper actuating mechanism of the machine illustrated in Fig. 1;

Fig. 3 is a side view, partly broken away and in section, of the same mechanism; and

Fig. 4 is a front view, partly broken away and in section, of the looper actuating mechanism.

The machine illustrated in the drawings is of the type disclosed in prior United States Letters Patent of Ashworth, No. 1,169,909, of February 1, 1916; No. 1,824,063, of September 22, 1931; and No. 2,015,654, of October 1, 1935, as well as in the patent above referred to. The present machine is similar in construction and operation, except as hereinafter described, to that in the present inventors' co-pending application, Serial No. 429,206, filed February 2, 1942, of which the present application is a division.

The machine is equipped with a curved hook needle **2**, a curved awl **4**, a thread case **6** mounted within a shuttle or loop taker, needle threading mechanism including a looper **10** and a thread finger **12**, a work support **14**, a presser foot **16**, and other stitch forming devices similar to those of the patents and application above referred to.

The work is fed in the illustrated machine as in the machine of Patents Nos. 1,824,063 and 2,271,611, and of the application referred to by movement of the work support and presser foot while clamping the work, the awl and the needle at this time being disengaged from the work. After the awl enters the work, the work support and presser foot are back fed, the awl holding the work from back feeding movement with the work support and presser foot, and all of the parts being driven from a sewing shaft **17**.

The mechanism for actuating the looper **10** of the present invention is constructed to move in a curving path generally in the line of feed, as in the machine of Patent No. 2,271,611 and the application referred to, and to avoid application of excessively heavy forces in any of its individual parts, ample bearing surfaces are provided for extreme durability in use. The looper proper is in the usual shape with an upstanding perforated thread receiving stem and in its present form is clamped to a two-part carrier **18** slidable lengthwise along an arm **20** provided with rectangular guiding surfaces inside the carrier, the lower edges of the carrier having flanges engaging grooves in the arm. The parts of the carrier are secured together at the forward end by a bolt **22** which secures the stem of the looper to the carrier and at its rearward end by a threaded stud and nuts **24** passing through the carrier parts and a block **26** of a shape corresponding to that of the arm **20**. The arm **20** swings on a piv-

ot pin 28 having a conical wear compensating portion fitting a corresponding opening in the carrier and clamped within a supporting bracket 30 secured to the machine frame. Swinging of the arm on its pivot pin causes the perforated end of the looper to move to the right and left of the needle. To impart a forward and rearward component of movement to the looper during the swinging movement of the arm 30, block 26 has clamped therein a headed pin 32 on which is rotatable a conical roll 34 engaging an S-shaped cam slot 36 formed in the bracket 30. The central portion of the bracket is recessed at 38 to provide space for a pin 40 having a conical wear compensating head fitting a correspondingly shaped opening in the arm 20. The pin 40 is secured within one end of an actuating link 42 pivotally connected by a conically headed pin 44 to a cam lever 46 fulcrumed at 48 on a fixed vertical shaft. The cam lever 46 is provided with a roll 50 engaging a cam 52 on the sewing shaft 17.

To take up wear in the joints of the looper actuating mechanism, the pins forming the pivots are loosened from the parts in which they are secured and adjusted endwise to bring larger sections of their conical portions into the openings forming their bearing surfaces. For adjusting the range of movement of the looper actuating link 42 to change the path of the looper laterally of the needle, the conical head of the pin 44 is formed eccentrically to the center of the shank of the pin and when rotated in one direction or the other, causes a corresponding change in the looper path. In order to adjust the position of the looper forwardly and rearwardly of the carrier 20 so that the curvature of the looper path may be located accurately in surrounding relation to the needle path, the bolt 22 passes through a slot 54 in the looper, enabling a limited change in position of the looper to be made along the carrier.

The nature and scope of the invention having been indicated and a particular embodiment of the invention having been described, what is claimed is:

1. An outsole shoe sewing machine having, in combination, stitch forming devices including a hook needle, a needle looper and a looper mechanism for moving the looper in a curving path comprising an arm pivoted on the frame of the machine to swing the looper from one side of the needle to the other generally in the line of feed, an actuating link connected to the arm, a looper carrier slidable on the arm forwardly and rearwardly of the needle, and means for shifting the carrier to impart a forward and rearward component of movement to the looper.

2. An outsole shoe sewing machine having, in combination, stitch forming devices including a hook needle, a needle looper and a looper mechanism for moving the looper from one side of the needle to the other in a curving path generally in the line of feed comprising an arm pivoted on the frame of the machine, an actuating link connected to the arm, a looper carrier slidable lengthwise along the arm forwardly and rearwardly of the needle, and a stationary S-shaped cam for imparting a forward and rearward component of movement to the looper when actuated by said link.

3. An outsole shoe sewing machine having, in combination, stitch forming devices including a hook needle, a needle looper and a looper mechanism for moving the looper from one side of the needle to the other in a curving path generally in the line of feed comprising an arm pivoted on the frame of the machine, an actuating link connected to the arm, a looper carrier slidable on the arm forwardly and rearwardly of the needle, means for shifting the carrier forwardly and rearwardly of the needle to impart a forward and rearward component of movement to the looper, means for adjusting the range of movement of the link to change the path of the looper laterally of the needle, and means for adjusting the looper forwardly and rearwardly of the carrier to locate the curvature of the looper path in surrounding relation to the needle path.

4. An outsole shoe sewing machine having, in combination, stitch forming devices including a hook needle, a needle looper and a looper mechanism for moving the looper from one side of the needle to the other in a curving path generally in the line of feed comprising an arm pivoted on the frame of the machine, an actuating link connected to the arm, a looper carrier slidable on the arm forwardly and rearwardly of the needle, means for shifting the carrier to impart a forward and rearward component of movement to the looper, and endwise adjustable pivot pins in said mechanism provided with conical portions received in correspondingly shaped openings forming bearings for the conical portions, the conical portion of one of said pins being arranged eccentrically to the remainder of said pin to enable the looper path to be changed with respect to the needle.

FRED ASHWORTH.
CARL F. WHITAKER.