

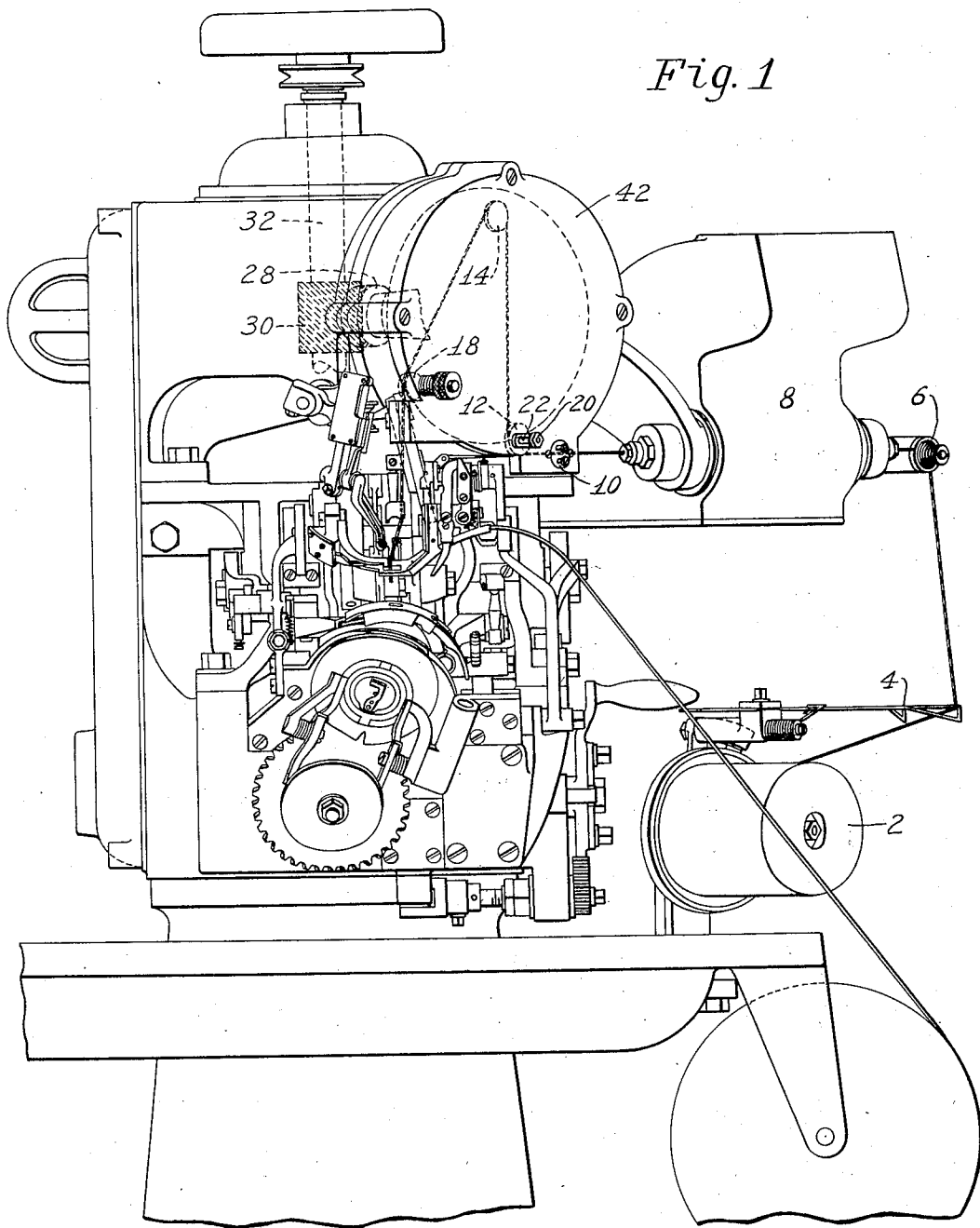
Oct. 1, 1935.

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2,015,655

SEWING MACHINE

Original Filed March 1, 1932 4 Sheets-Sheet 1



Witness
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Inventor
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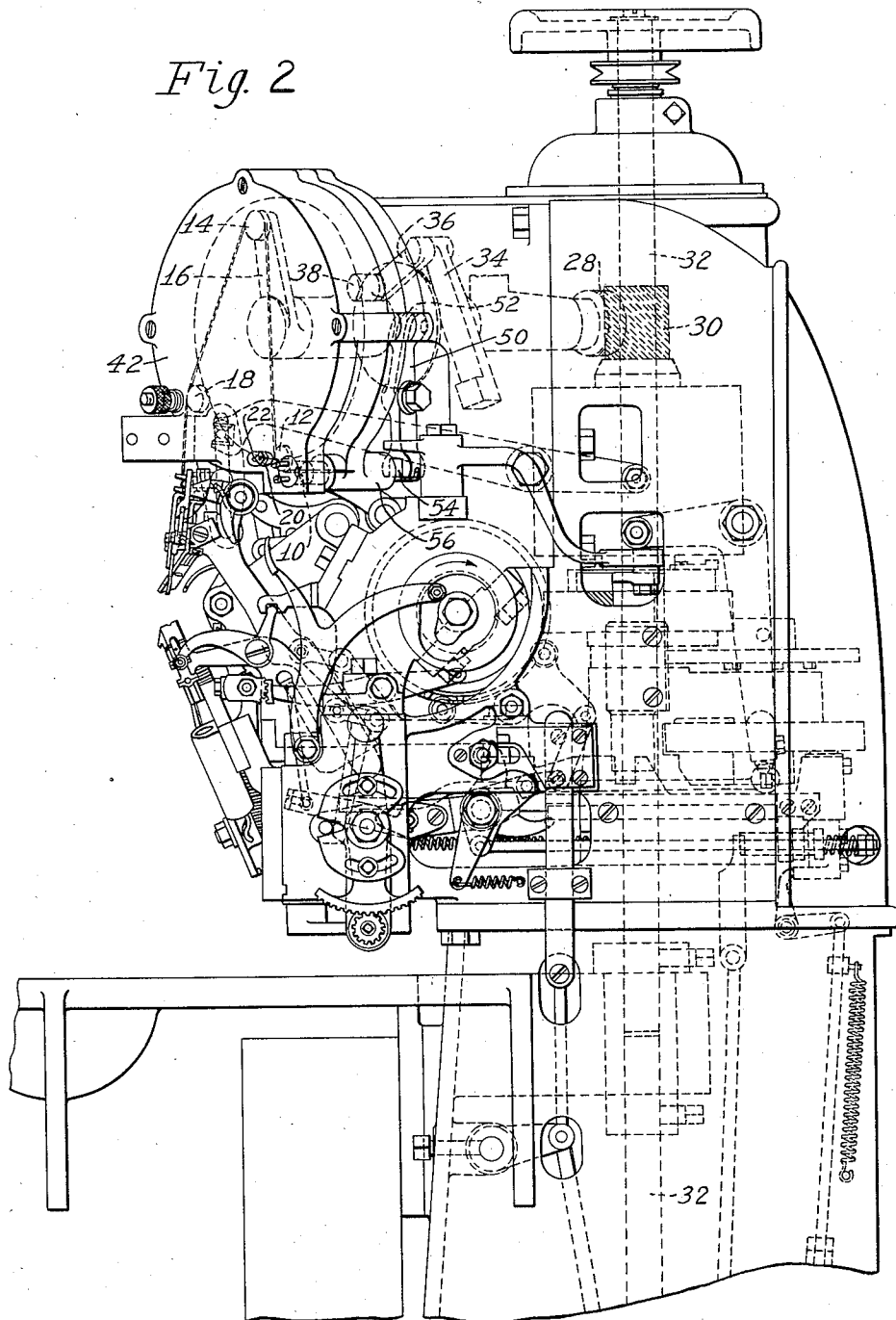
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Fig. 2



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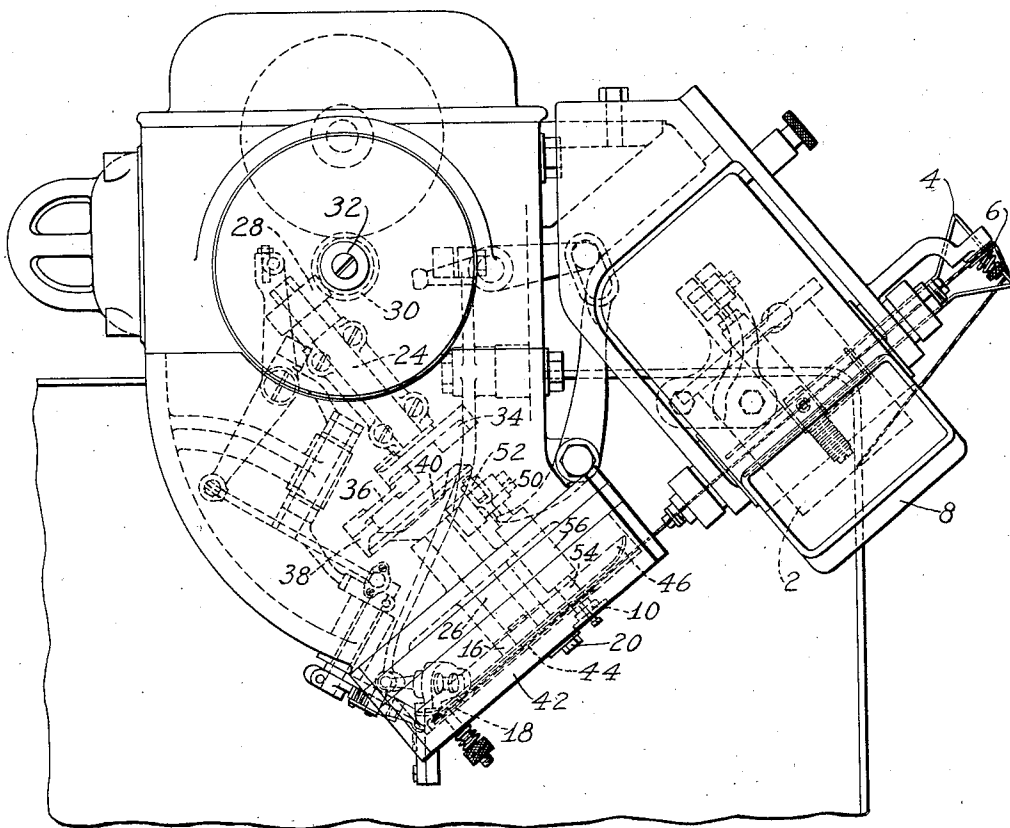
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SEWING MACHINE

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Fig. 3



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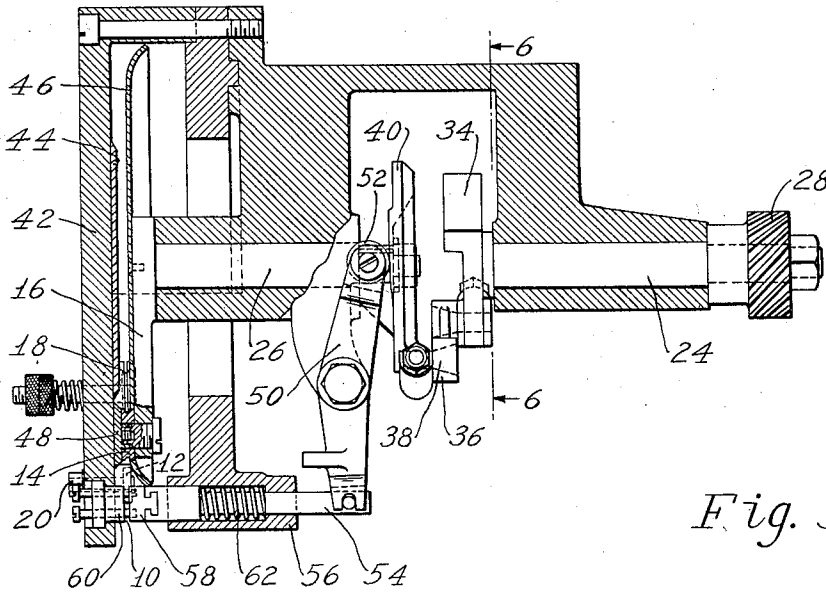


Fig. 5

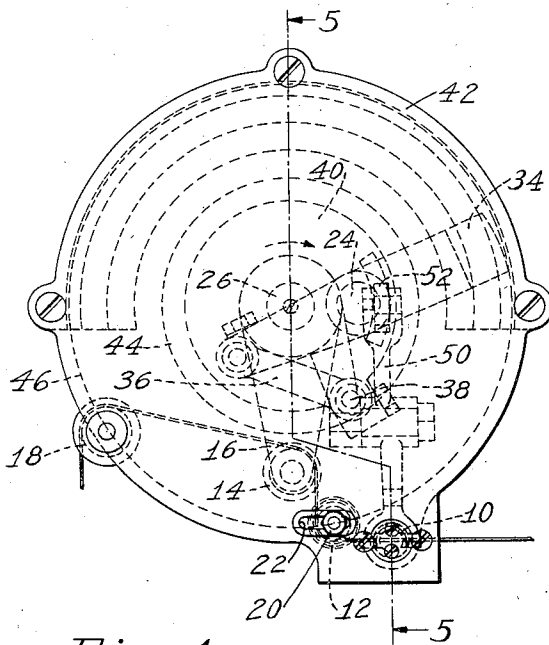


Fig. 4

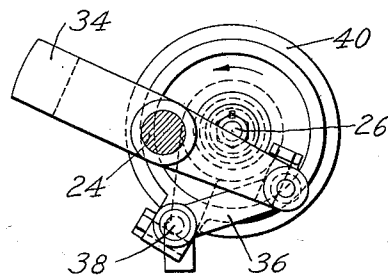


Fig. 6

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UNITED STATES PATENT OFFICE

2,015,655

SEWING MACHINE

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Original application March 1, 1932, Serial No.
596,051. Divided and this application April 10,
1934, Serial No. 719,886

4 Claims. (Cl. 112—57)

The present invention relates to sewing machines, and more particularly to a rotary take-up mechanism for use in a shoe sewing machine provided with a hook needle and adapted to sew a lockstitch seam. The invention is herein disclosed as embodied in a machine for sewing the welt to the sole and out-turned upper of a stitch-down shoe. This machine forms the subject-matter of application Serial No. 596,051 filed March 1, 1932 of which the present application is a division.

The object of the invention is to simplify and improve the construction and operation of hook needle lock stitch machines, and more particularly the take-up mechanism of such machines and, with this object in view, the invention consists in the constructions, combinations, and arrangements of parts hereinafter described and claimed.

The several features of the invention, together with the advantages secured thereby will be readily understood by those skilled in the art from the following description taken in connection with the accompanying drawings.

In the drawings Figure 1 is a view in front elevation of the head of a lockstitch machine for stitching the welt to the out-turned upper and sole of a stitchdown shoe embodying the several features of the present invention; Figure 2 is a view in right side elevation of the head of the machine with the wax pot and thread reel removed to show underlying parts; Figure 3 is a top plan of the machine with the operating connections for the thread finger, take-up and thread lock shown in dotted lines; Figure 4 is a front view on a large scale of the take-up mechanism; Figure 5 is a sectional view of the take-up mechanism taken on the line 5—5 of Figure 4; and Figure 6 is a view taken on the line 6—6 of Figure 5.

The thread handling devices of the machine are arranged to form a lockstitch seam and comprise a rotating shuttle located below the work table, a curved hook needle also located below the work table, a loop spreader for moving the needle loop into the path of the shuttle, a curved awl located above the work table, a looper and a thread arm for placing the needle thread in the needle, a rotary take-up for setting the stitch, and a thread lock against which the stitch is set.

For positioning and feeding the work with relation to the thread handling devices, a work support and cooperating presser foot are provided which are arranged to grip and to feed the work in timed relation to the operation of the thread handling devices.

For a complete disclosure of the construction and operation of the parts of the machine not hereinafter specifically described, reference may be had to application Serial No. 596,051 above referred to.

The needle thread (see Figs. 1, 3, and 4) is led from a thread reel 2 over a thread tension member 4 for controlling a reel brake, past a thread tension 6 and through the wax pot generally indicated at 8 to a thread lock 10. From the thread lock 10 the thread is carried around a guide roll 12 over the thread take-up roll 14 on the take-up arm 16, and through a second thread tension 18, and from there to the looper. In order to provide for an adjustment of the take-up action of the take-up arm to pull in more or less thread, the guide roll 12 is mounted on a bracket 20 which is adjustably clamped in a slot 22 in the take-up housing. The adjustment of the bracket 20 in the slot 22 tends to move the guide roll 12 toward or away from the tension 18, causing more or less thread to be taken up by the movement of the take-up roll 14 to the top of its throw.

The take-up of the present machine (see Figs. 4, 5, and 6) is of the rotary type, being arranged to make one complete revolution for each cycle of operations in the machine. With the present construction, a variable speed drive is provided which is arranged to permit a comparatively rapid movement of the take-up lever in taking up and also in giving up the needle thread, while permitting a relatively long dwell to the take-up at the top and bottom of its stroke to cooperate with the sewing instrumentalities. This variable speed driving mechanism comprises a horizontal driving shaft 24 which is mounted parallel to, but with its axis offset from, the axis of the shaft 26 to which the take-up arm 16 is secured. At its rear end the drive shaft 24 is provided with a worm gear 28 which engages with a worm 30 (see Fig. 2) on the vertical drive shaft 32 of the machine. At its forward end the shaft 24 is provided with a crank arm 34 which is connected through a drag link 36 to a crank pin 38 mounted on a disk 40 on the take-up shaft 26, so that accelerating and retarding movements are obtained in the rotation of the take-up during each revolution.

In order to prevent the thread from jumping off from the take-up roll 14 or becoming entangled with the other parts, the take-up is arranged to operate within an enclosing housing 42, the front wall of which is parallel to the plane of movement of the take-up. A passageway for the thread is formed between a stationary plate 44 secured to the front wall of the housing 42, and

a flanged disk or shield 46 secured to the end of the take-up shaft 26. A bevel edge disk or button 48 is mounted upon the outer end of the take-up roll 14, and is arranged to bear against the wall of the housing outside of the stationary plate. The thread is thus prevented from jumping off from the take-up roll, being positively guided between the plate 44 and the button 48 on one side, and the shield 46 on the other side into engagement with the roll 14. Furthermore, the thread is at all times held in position within the housing to prevent its becoming entangled with other parts of the machine, and the housing also tends to retain the loop of thread in the extended position to which it is brought by the operation of the take-up during the idle revolution of the take-up in stopping the machine.

The thread lock 10 above referred to is maintained normally in locking position, but is opened momentarily during each sewing cycle, to permit the drawing off of additional thread from the supply, through connections comprising a cam lever 50 provided at one end with a cam roll 52 arranged to ride on the face of the disk 40, and at its other end connected to an endwise movable shaft or plunger 54 for engaging and releasing the thread lock. The plunger 54 is journaled in a bracket 56 in the housing 42, and is provided at its forward end with a tip or head 58 having formed thereon a clamping surface which is arranged to cooperate with a similar surface on a fixed plate indicated at 60 to clamp the thread between them. Two guide screws secured to the member 60 and arranged to project into corresponding recesses in the head 58 serve to position the thread between the two surfaces of the thread lock. A compression spring 62 coiled about the plunger 54 between a shoulder formed on the bracket 56 tends to hold the surfaces of the thread lock normally in locking position. A raised portion on the cam disk 40, engaging with the roll 52, causes the cam lever 50 to move slightly to retract the plunger against the pressure of its spring to release the thread at the desired point in each sewing cycle.

The invention having been described, what is claimed is:

1. In a sewing machine, the combination of stitch forming devices comprising a hook needle, a shuttle, and a take-up mechanism including a rotary take-up member, a stationary housing for the take-up member having a flat surface normal to the axis of rotation of the take-up member, a take-up roll mounted to move with the take-up member and arranged to engage with the flat

surface, a shield secured to turn with the take-up member arranged to confine the thread within narrow limits between the shield and the said surface of the housing to insure the engagement of the thread by the take-up roll, and guides for positioning the thread in the housing with relation to the take-up roll.

2. In a sewing machine, the combination of stitch forming devices comprising a hook needle, a shuttle, and a take-up mechanism including a rotary take-up member, a stationary housing for the take-up member having a flat surface normal to the axis of rotation of the take-up member, a take-up roll mounted to move with the take-up member and arranged to engage with the flat surface, a shield secured to turn with the take-up member arranged to confine the thread within narrow limits between the shield and said surface of the housing, a disk secured to said flat surface positioned within the circle of movement of the take-up roll to further confine and insure the engagement of the thread by the take-up roll, and guides for positioning the thread in the housing with relation to the take-up roll.

3. In a sewing machine, the combination of stitch forming devices comprising a hook needle, a shuttle, and a take-up mechanism including a rotary take-up member, a stationary housing for the take-up member having a flat surface normal to the axis of rotation of the take-up member, a take-up roll arranged to move with the take-up member and engaging with said flat surface, a shield for confining the thread within narrow limits between the shield and said flat surface to insure the engagement of the thread by the take-up roll, a drive shaft offset from the axis of the take-up member and arranged to make one revolution for each stitch forming cycle, and a drag link for operating the take-up from the drive shaft arranged to rotate the take-up through a corresponding revolution at a varying rate of speed.

4. In a sewing machine, the combination of stitch forming devices comprising a hook needle, a shuttle, a rotary take-up member, a supply from which the needle thread is drawn, a thread lock located between the take-up and the supply, a drive shaft offset from the axis of the take-up arranged to impart one revolution thereto for each sewing cycle, a drag link for operating the take-up from the drive shaft at a varying rate of speed, a cam member secured to rotate with the take-up member, and means controlled by said cam to release the thread lock at a predetermined point in the rotation of the take-up member.

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