

J. M. MERROW.
OVERSEAMING MACHINE.

APPLICATION FILED DEC. 26, 1914. RENEWED AUG. 28, 1916.

1,217,975.

Patented Mar. 6, 1917.

2 SHEETS—SHEET 1.

FIG. 1.

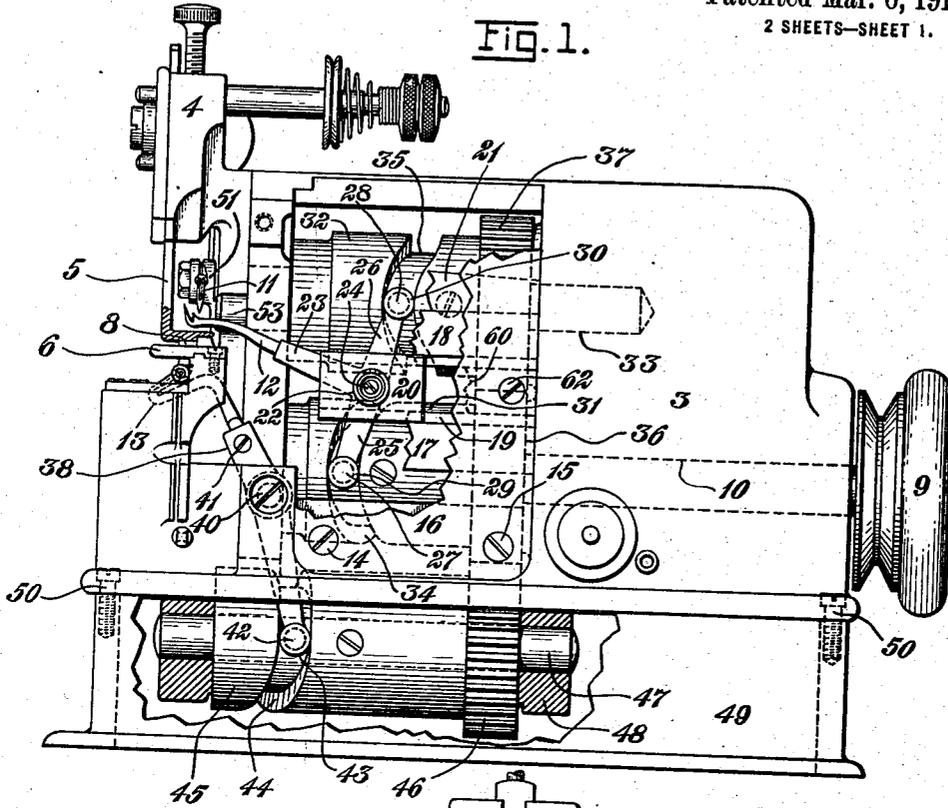
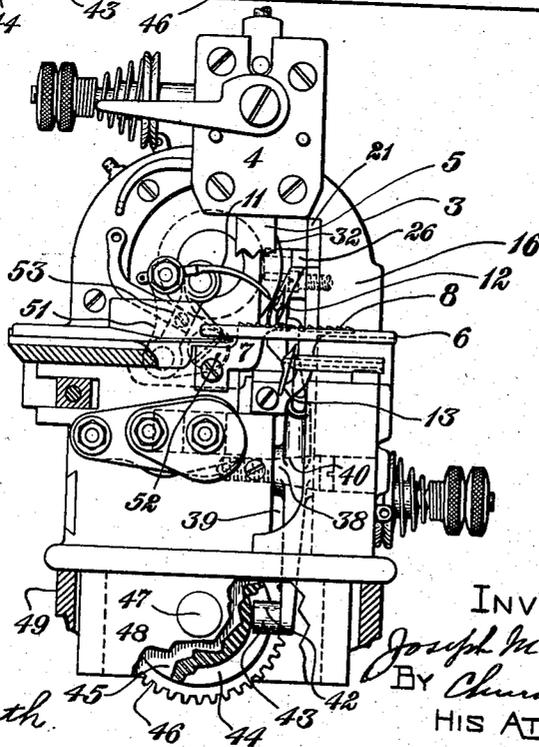


FIG. 2.



WITNESSES:

Halter Brown

Francis E. Ruth

INVENTOR

Joseph M. Merrow

BY *Church & Church*
HIS ATTORNEYS.

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2 SHEETS—SHEET 2.

Fig. 3.

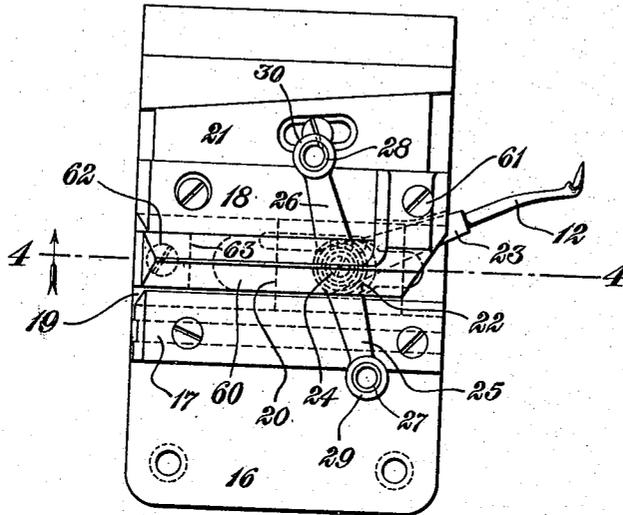
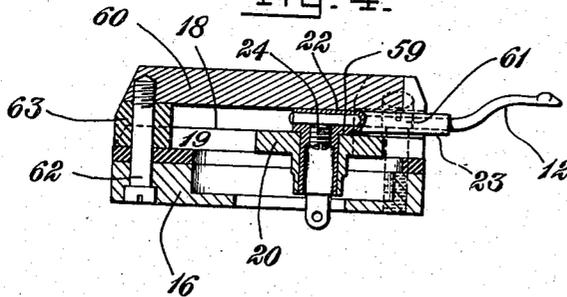


Fig. 4.



WITNESSES:

Halbert Brown
Francis C. Ruth

INVENTOR:

Joseph M. Merrow
By *Chas. & Thos.*
HIS ATTORNEYS

UNITED STATES PATENT OFFICE.

JOSEPH M. MERROW, OF HARTFORD, CONNECTICUT, ASSIGNOR TO THE MERROW MACHINE COMPANY, OF HARTFORD, CONNECTICUT, A CORPORATION OF CONNECTICUT.

OVERSEAMING-MACHINE.

1,217,975.

Specification of Letters Patent.

Patented Mar. 6, 1917.

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To all whom it may concern:

Be it known that I, JOSEPH M. MERROW, a citizen of the United States, residing at Hartford, in the county of Hartford, State of Connecticut, have invented certain new and useful Improvements in Overseaming-Machines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the figures and numerals of reference marked thereon.

This invention relates to overseaming machines of a type characterized by stitch forming elements comprising an eye pointed thread carrying needle and two loopers. Each of these elements in the process of interlooping threads to form overedge stitches must, during one stitch forming cycle, be definitely moved to separated points to cooperate respectively with each of the other two. To accomplish this sequence of action at the extremely high speeds required in this class of machines, it is also essential that the looper supporting mechanism have great rigidity with a minimum of restraining effect to the free action of the moving parts. The provision of mechanism, effective in these respects is the primary object of my invention. Other objects will hereinafter appear.

In the drawings accompanying and forming part of the present specification there is shown in detail one convenient form of embodiment of my invention. The arrangement and design of the various parts however are not limited to the exact showing of the illustrations, as changes therein may be made in many respects within the scope of the invention as defined by the claims.

Referring to the drawings:

Figure 1 is a front elevation of an overseaming machine of the type above mentioned,—parts being broken away and in section to more clearly show features of my invention.

Fig. 2 is an end view of the machine as seen from the left in Fig. 1 certain parts being removed or broken away and others shown in section.

Fig. 3 is a view of the inner face of the frame cap with looper supporting parts in position thereon.

Fig. 4 is a sectional view on line 4—4 of Fig. 3.

Similar reference numerals designate similar parts throughout the several views.

To briefly identify such well known parts of the machine as have been illustrated together with less conspicuous detail entering into the invention,—3 designates the machine frame, 4 the head, 5 the presser-foot, 6 the needle plate, 7 and 8 the feed dogs, 9 the driving wheel, and 10 the driving shaft. The stitch forming elements comprise the needle 11, a looper 12 and a looper 13, each of which is given (as will hereinafter appear) a suitable movement in the process of interlooping threads to form overseam stitches. Thread guides, takeups, tension and a chaining finger (around which latter stitches may be formed) all of which are common in overseaming machines and some of which are shown in the drawings, it is thought need not be herein specifically described.

Fitted in an opening in the front of the machine frame 3 and secured by screws 14 and 15, is the frame cap 16, provided on its inner face with gibs 17 and 18 to form a raceway 19 which movably supports the slide 20. Bearing against gib 18 is an adjusting wedge 21. Pivotaly mounted in said slide 20 is a carrier 22 for the looper 12, the latter being inserted in an arm of the carrier and removably held therein by a set screw 24. Extending from the carrier 22 in opposite directions and at approximately right angles to the arm 23 are arms 25 and 26 provided respectively with studs 27 and 28 and anti-friction rolls 29 and 30, which as will hereinafter appear are positively actuated, by cams to effect the desired movement of the looper 12.

Within the machine frame 3, opposite the frame cap 16 are a pair of cam cylinders 31 and 32 the former being secured to the driving shaft 10, and the latter to a shaft 33, which is shown above the driving shaft and as extending parallel thereto. The cam cylinders 31 and 32 are grooved respectively as at 34 and 35, each to receive its corresponding stud roll 29 and 30 associated as already described with the looper carrier 22.

Rigid with the cam cylinders 31 and 32 are the intermeshing gears 36 and 37 respec-

tively, by virtue of which rotation of the driving shaft will cause the cam cylinders to rotate in unison, the cam grooves 34 and 35 effecting through the connections described an oscillating, bodily reciprocatory movement of the looper 12 so that the latter passes above, to one side of, and below the plane of but not under the needle plate to cooperate in required sequence with the needle and with the other looper 13.

In forming the stitch to be produced by the machine illustrated the looper 13 passes back and forth from beneath the needle plate and to one side of the needle plate to cooperate alternately with the needle and the looper 12. To effect this movement an oscillatory carrier 38 for the looper 13 is provided pivotally supported intermediate its ends in a slot 39 in the machine frame on a taper stud 40. A socket in one end of the carrier 38 receives the shank of looper 13 which is secured by a set screw 41. At its opposite end, carrier 38 is provided with a stud 42 and an anti-friction roll 43, which roll is actuated by a cam groove 44 in a cam cylinder 45.

This last mentioned cam cylinder, which is similar to the other two previously described but preferably longer, is mounted parallel with the latter and provided with a driving gear 46 which meshes with the gear 36, whereby the third cam cylinder 45 will rotate in unison with the other cam cylinders. A supporting shaft 47 for cam cylinder 45 is journaled in a bearing frame 48 depending from the machine frame 3 and inclosed within a sub-base 49 to which said machine frame 3 is secured by screws as 50.

The needle shown in the drawings is of the curved type. It is adapted to be oscillated by its carrier 51 in a well known manner which may be briefly described as follows:—

Needle carrier 51 is supported on a pivot 52 and connected by a pitman or link 53 with an eccentric extension of shaft 33 so that as the latter is rotated the needle through its carrier will be swung through an arc approximately bisected by the needle plate and crossed above said needle plate by the looper 12 and below it by the looper 13.

The character of looper carrier 38 and the simple oscillating movement required thereof permits of its being substantially mounted on a pivot well supported at both ends as shown and already explained. The other looper carrier 22, however, has a compound movement, that is,—it is bodily reciprocated together with its supporting slide 20, and at the same time it is oscillated about the axis of its pivotal connection with said slide.

It is desirable that the looper 12 be supported so as to prevent lateral shake and at the same time be free to move in its path, and to that end a new form of looper carrier guide is shown in Figs. 3 and 4.

The guideway for slide 20 as above stated, includes gibs 17 and 18, fastened to the frame cap 16 to which is also secured adjusting wedge 21, this particular arrangement of frame cap parts being shown and described in United States Patent No. 441,315 granted to me November 25th, 1890. My present invention pertains in part to the novel form and mounting of a back guide for the looper carrier 22. Said looper carrier 22, adjacent to its pivot portion, is formed with a shoulder 59 and the slide 20 affords a bearing surface for said shoulder. An opposing bearing surface for the opposite side of looper carrier 22 is provided on the back guide or bar 60 which is preferably secured to the face of the upper gib 18 by means of a screw 61 which extends through the said gib and screws into the frame cap thus securing one end of the gib 18 and one end of the back guide 60, to the frame cap 16.

The opposite end of the back guide 60 is secured to the frame cap 16 by means of the screw 62 which extends through the frame cap from the outside and also through the block 63, and screws into the back guide, the block 63, being of such height that the surface of the back guide in proximity to the rear side of the looper carrier 22 is parallel with the movements of said looper carrier.

By this construction the looper carrier 22 is supported and prevented from undue lateral vibration or lost motion and at the same time is free to oscillate and travel bodily. The peculiar construction of the back guide 60 with the block 63 interposed between the said back guide and the frame cap makes for easy and accurate construction, repair, and maintenance, inasmuch as all the parts involved are sustained by the frame cap.

In operation, as the hand wheel is turned, the cam cylinders revolve, the upper shaft rotates, reciprocating the needle, the lower looper, cooperating with the needle below the needle plate, oscillates in a path extending beyond the edge of the needle plate across the path of the upper looper; the upper looper reciprocates in a path crossing the path of the lower looper and also crossing the path of and cooperating with the needle above the needle plate. Thus the lower looper cooperates with the needle and the upper looper, which latter in turn cooperates with the lower looper and the needle to form overedge stitches. As shown in the drawings, the needle is designed to carry a thread, the lower looper is provided with an eye for carrying a second thread through a loop of needle thread below the needle plate and the upper looper is provided with a point and a throat for catching and carrying a loop of the lower looper thread around the edge of the needle plate and into the

path of the needle so that the latter may pass through the loop of lower looper thread, thus forming overseam stitches with two threads.

5 In this machine the point of the lower looper passes in the rear of the needle above the eye of the latter and moves toward and beyond the path of the upper looper while the point of the latter is below the path of the said lower looper, and the upper looper then rises, passing its point back of the eye of the lower looper, and continues in its path upward, toward, and beyond and in front of the point of the needle when the latter has risen to approximately its highest position and as the needle descends, the needle point enters the loop of thread carried by the upper looper, carrying the needle thread down through said loop and through the fabric, while the upper looper returns around the edge of the needle plate to its former lowest position, and meanwhile the lower looper has returned beyond the path of the needle, ready for its next advance.

25 When three threads are employed in overseaming the upper looper would be provided with an eye for carrying a thread, a loop of which it would carry through the loop of the lower looper thread thus presenting a loop of the third thread to the needle, as is well known in the sewing machine art.

What I claim is:

1. In an overseaming machine, in combination, a reciprocatory needle, a bodily reciprocatory looper, a pair of cam cylinders provided with means for actuating said looper, a second looper, and a third cam cylinder provided with an irregular groove for actuating said second looper.

40 2. In an overseaming machine, in combination, a reciprocatory needle, a looper cooperative with the needle, a second looper cooperative with the needle and with the first mentioned looper, means including two cam cylinders for actuating one of said loopers and means including a third cam cylinder provided with an irregular groove for actuating the other looper.

50 3. In an overseaming machine, in combination, a reciprocatory needle, a looper cooperative with the needle, a second looper cooperative with the needle and with the first mentioned looper, a cap supported by and removable from the machine frame, supporting means for one of said loopers mounted on said cap, a pair of cam cylinders provided with means for actuating the cap supported looper, and a third cam cylinder provided with an irregular groove for actuating the other looper.

60 4. In an overseaming machine, including a reciprocatory needle and in combination therewith, a looper carrier pivotally and slidably mounted, a pair of cam cylinders provided with means for actuating said

looper carrier, a second looper carrier pivoted intermediate its ends, and a third cam cylinder provided with an irregular groove for actuating said second looper carrier.

5. In an overseaming machine, including a reciprocatory needle and in combination therewith, a pair of loopers each movable to cross the path of the other and to cross the path of the needle and three cam cylinders geared to rotate in unison, two of said cam cylinders being provided with means for actuating one of said loopers and the third cam cylinder being provided with an irregular groove to actuate the other looper.

6. In an overseaming machine including a reciprocatory needle and a needle plate, and in combination therewith, a looper supported for bodily reciprocatory, oscillating movement, a second looper supported for oscillating movement, a pair of cam cylinders provided with means for actuating the first mentioned looper and a third cam cylinder provided with an irregular groove for actuating the second mentioned looper, all of said cam cylinders being connected to rotate in unison whereby the loopers will be actuated to cooperate with the needle and with each other to interloop thread to form overedge stitches.

7. In an overseaming machine, including a reciprocatory needle and a looper cooperative therewith, the combination of a removable frame cap, a slide supported by the frame cap, a guide bar, having an offset foot at one end and a removable spacing block at the other end, whereby it may be attached to the frame cap in definite relation thereto, and a looper carrier interposed between said guide bar and the slide and pivoted to the latter.

8. In an overseaming machine, including a reciprocatory needle and loopers cooperative therewith, the combination of a removable frame cap, a slide supported by the frame cap, a looper carrier pivoted to said slide, means for actuating the looper carrier, a guide bar having an offset foot on one end and provided with a surface to oppose displacement of the looper carrier, a spacing block interposed between the guide bar and the frame cap, and means in proximity to the ends of the bar for attaching it to the frame cap.

9. In an overseaming machine, including a reciprocatory needle and a looper cooperative therewith, the combination of means within the machine frame for actuating the loopers, a removable frame cap, gibs secured to the frame cap to form a guideway, a slide supported by the guideway, a guide bar having an offset foot at one end thereof supported upon one of the gibs, a removable spacing block located between the gibs for supporting the opposite end of the guide bar, two separate means extending respec-

tively through one of said gibs and through said spacing block for securing the guide bar to the frame cap, and a looper carrier interposed between said guide bar and the

5 slide and pivoted to the latter.

10. In an overseaming machine including a reciprocatory needle and a needle plate, in combination, an upper looper, a pair of cam cylinders intergeared to rotate in unison and provided with cooperating cam grooves for actuating said looper, a third cam cylinder operatively associated with the other two, a lower looper actuated by an irregular groove in said third cam cylinder, and means for supporting the loopers, whereby the lower looper cooperates with the needle below the needle plate and with the upper looper; and the upper looper cooperates with the lower looper and with the needle above the needle plate to form overedge stitches.

11. In an overseaming machine, the combination of the following instrumentalities, to wit: a reciprocatory needle, a bodily reciprocatory looper, an oscillatory looper and a plurality of cam cylinders geared together and provided with irregular grooves in their cylindrical faces, there being two grooves cooperating to operate the bodily movable looper and a third groove for operating the

30 oscillatory looper.

12. In an overseaming machine, in combination, a reciprocatory needle, a bodily reciprocatory looper, an oscillatory looper and a plurality of cam cylinders geared together and provided with irregular peripheral grooves, there being two grooves cooperating to actuate the bodily movable looper and a third groove for actuating the oscillatory looper.

40 13. In an overseaming machine, in combination, a reciprocatory needle, a looper cooperative with the needle, a second looper cooperative with the needle and with the first mentioned looper, a cap supported by and removable from the machine frame, supporting means for one of said loopers mounted on said cap, a plurality of cam cylinders geared together and provided with irregular grooves there being two grooves for actuating the cap supported looper and a third groove for actuating the other looper.

50 14. In an overseaming machine, in combination, a reciprocatory needle, a bodily reciprocatory looper, an oscillatory looper

pivoted intermediate its ends, a plurality of cam cylinders geared together and provided with irregular grooves there being two grooves cooperating to actuate one of the loopers and a third groove for actuating the other looper.

15. In an overseaming machine, in combination, a reciprocatory needle, a pair of loopers each movable to cross the path of the other and to cross the path of the needle, a plurality of cam cylinders geared together and provided with irregular grooves there being two grooves cooperating to actuate one of the loopers and a third groove for actuating the other looper.

16. In an overseaming machine, including a reciprocatory needle and a needle plate, and in combination therewith, a looper supported for bodily reciprocatory, oscillating movement, and a plurality of cam cylinders provided with irregular grooves, there being two grooves cooperating to actuate one of the loopers and a third groove for actuating the other looper, all of said cam cylinders being connected to rotate in unison whereby the loopers will be actuated to cooperate with the needle and with each other to inter-loop thread to form overedge stitches.

17. In an overseaming machine, in combination, a reciprocatory needle, a bodily reciprocatory looper, a lever having its fulcrum intermediate its ends, a second looper secured to one end of said lever and a plurality of cam cylinders provided with irregular grooves, there being two grooves cooperating to actuate the bodily reciprocatory looper and a third groove for actuating the lever.

18. In an overseaming machine, in combination, a reciprocatory needle, a bodily reciprocatory looper, a pair of cam cylinders provided with means for actuating said looper, a lever, a second looper secured to one end of said lever, and a third cam cylinder provided with an irregular groove adapted to receive the other end of the lever for imparting movement thereto, the fulcrum for said lever being intermediate its ends.

JOSEPH M. MERROW.

Witnesses:

F. W. SPELLMAN,
F. E. ANDERSON.