Dec. 11, 1934. J. M. MERROW 1,983,631

LOOPER CARRIER

Filed May 29, 1933

Fig. 1.

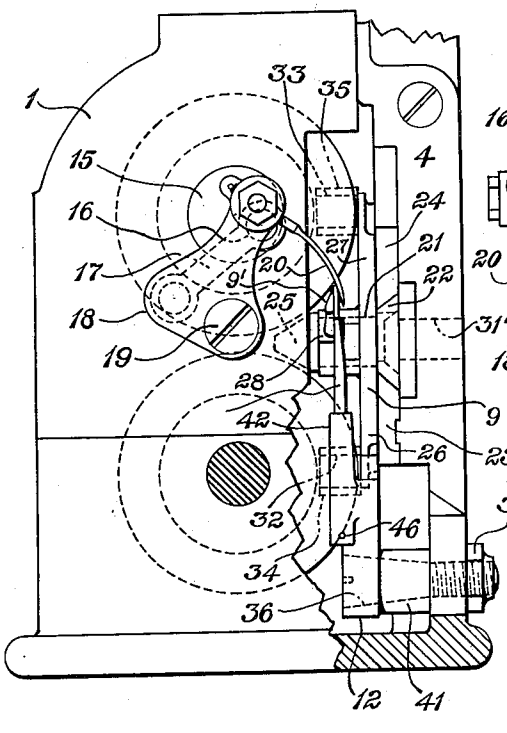


Fig. 2.

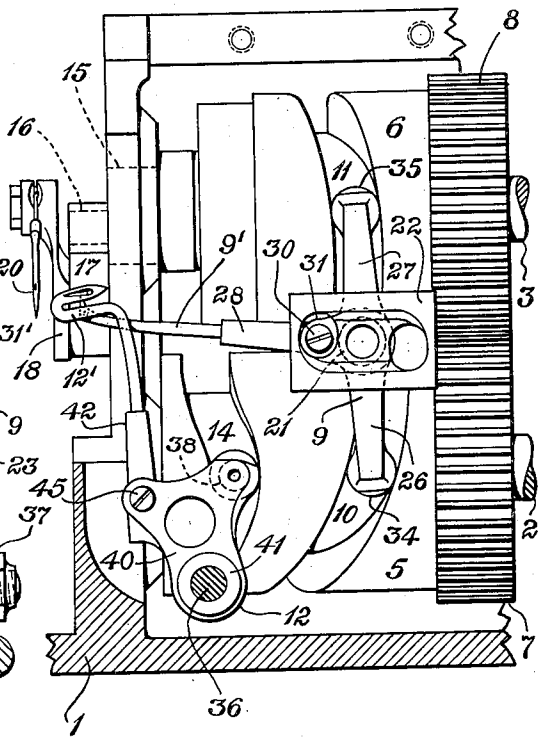


Fig. 3.

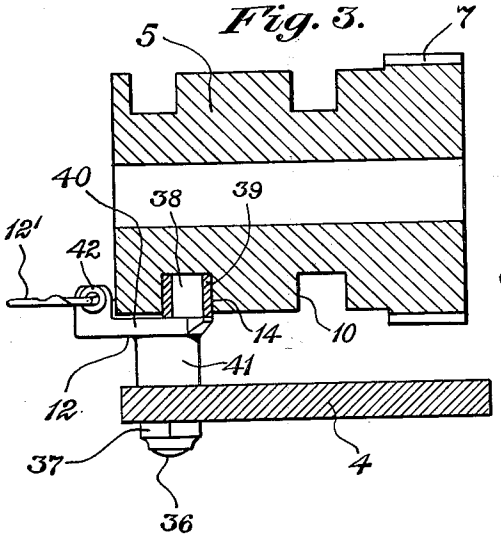


Fig. 4.

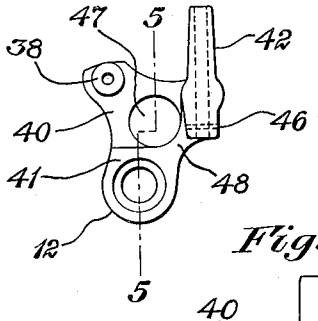
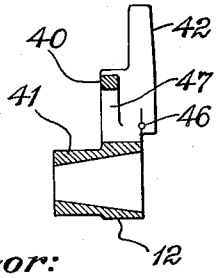


Fig. 5.



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UNITED STATES PATENT OFFICE

1,983,631

LOOPER CARRIER

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Application May 29, 1933, Serial No. 673,511

6 Claims. (Cl. 112—162)

This invention relates to overseaming machines and especially to machines of this type wherein the stitch forming implements comprise a thread carrying needle and two thread engaging loopers. Such a machine is illustrated and described in United States Patent #1,278,973, issued to Joseph M. Merrow, September 17, 1918 and also in several other United States patents on the Merrow type of sewing machine.

The object of my invention is the provision of an improved lower looper carrier and improvement in arrangement of parts in association of the lower looper carrier with an upper looper carrier and the actuating mechanism for both, as well as in the co-relation of the loopers with the needle in the field of stitch formation.

The invention includes a lower looper carrier having its stud for a cam engaging roll and its looper carrying arm so located that the path of movement of said arm lies between and substantially in parallelism with planes which are at right angles to the axis of the stud and coincident respectively with the base and free end thereof, the pivotal support of the carrier also extending into the space between said planes in the direction of its pivotal axis. With this form of carrier an arrangement with associated means may be effected whereby the field of stitch formation, pivotal support of the upper looper carrier, part of the pivotal support of the lower looper carrier, the cam roll engagement of both of the carriers with respective cam grooves, and the longitudinal extent of both loopers is maintained between two planes respectively coincident with opposite ends of the cam rolls. This arrangement permits the use of loopers that are not materially offset in their form from a single plane to which the loopers are closely confined in their movements so that twisting stresses developed in their operation at high speed imparted through their carriers is reduced to a minimum if not entirely eliminated.

In the accompanying drawing illustrating one convenient form of embodiment of my invention,—

Figure 1 is an end view of part of an overseaming machine of the Merrow type with part of the frame indicated as broken away to more clearly show an arrangement of loopers and their support with respect to actuating mechanism.

Figure 2 is a longitudinal sectional view of part of the machine frame shown in Fig. 1 with stitch forming implements and means for actuating them shown in elevation.

Figure 3 is a longitudinal sectional view of a cam and frame cap with a lower looper carrier interposed therebetween and pivotally supported upon the frame cap.

Figure 4 is a detail view of a lower looper carrier and,—

Figure 5 is a sectional view on line 5—5 of Fig. 4.

Referring to the drawing, 1 indicates a machine frame, 2 a main shaft upon which a driving pulley (not shown) may be mounted, 3 an upper shaft parallel with the lower or main shaft, and 4 a frame cap which supports for respective movement thereon a carrier for each of a pair of loopers, said frame cap being removably secured to the machine frame as by screws (not shown).

Cam cylinders 5 and 6 secured respectively to main shaft 2 and upper shaft 3 are provided with intermeshing gears 7 and 8 whereby both cylinders and the upper shaft revolve in unison when the lower shaft is rotated.

For actuating an upper looper carrier as 9, together with its looper 9', cam cylinders 5 and 6 are provided respectively with correlated cam grooves 10 and 11, and for actuating a lower looper carrier as 12, together with its looper 12', an additional cam groove 14 is provided in lower cam cylinder 5.

The outer or left hand end of the upper shaft 3 is provided with an enlargement 15 which carries a wrist pin 16 running in one end of a link 17, the other end of which is operatively secured to the needle carrier 18 which is pivotally secured to the frame of the machine upon screw stud 19 and carries the eye pointed needle 20 which latter is suitably reciprocated upon its stud at each revolution of the cam cylinders.

To permit of a compound movement of the upper looper carrier 9, it is pivotally supported upon a stud 21, preferably integral with the slide or block 22 which is movable horizontally in a raceway provided by the inner face of frame cap 4, a lower gib 23 and an upper gib 24. At its rear side the carrier 9 may be laterally supported by a back guide 25, see Fig. 1. Looper carrier 9 is formed with two arms 26 and 27 extending equally from one end of the pivotal hub through which stud 21 extends, and is also provided with a lateral arm 28 extended from the other end of the hub and which is drilled to form a socket to receive the shank of upper looper 9' which is secured in its socket by a screw as 30 accessible through a hole 31 in slide 22 and a suitable opening 31' extending through to the front of the frame cap.

Adjacent the outer extremity of each of its arms 26 and 27 the upper looper carrier is pro-

vided with respective pivotal studs 32 and 33, each bearing an anti-friction roll as 34 and 35 to fit respectively the cam grooves 10 and 11 by means of which the looper carrier is oscillated upon its pivotal axis and also reciprocated bodily horizontally with the sliding block 22, the resultant effect upon the looper being its movement in a required path which it will be noted is, together with carrier arm 28, confined to space between planes defined by the ends of cam rolls 34 and 35, (see Fig. 1).

To permit of oscillatory movement of lower looper carrier 12, it is pivotally supported upon a stud 36, preferably tapered, which is threaded into the frame cap and further secured thereto by check nut 37. For actuating this carrier it is provided with a pivotal stud 38 bearing an anti-friction roll 39 which fits into cam groove 14.

In operation, as the cam cylinders revolve, the upper shaft rotates, reciprocating the needle, the lower looper, cooperating with the needle, oscillates in a path extending across the path of the upper looper, and the upper looper reciprocates in a path crossing the path of the lower looper and also crossing the path of the needle for cooperation therewith. The loopers as usual are suitably formed to cooperate with the needle and with each other and it will be understood that loopers of different suitable forms may be employed for various purposes. Thus the lower looper cooperates with the needle and the upper looper, and the latter in turn cooperates with the lower looper and the needle to form overedge stitches.

The pivotal axis of the upper looper lies in a horizontal plane extending between the two cam cylinders. Owing to this fact it is possible to extend from the pivotal axis, and at substantially right angles thereto, both the looper receiving arm 28 and its looper, without either departing laterally from between planes defined respectively by opposite ends of cam roll studs 32 and 33, within which space is also included the field where the upper and lower looper cooperate with the needle and with each other to form overedge stitches. By thus maintaining the looper and its arm within the space indicated, any considerable offset of the parts involved is avoided. This arrangement is highly desirable as otherwise in high speed operation, twisting stresses would be developed tending to throw the carrier objectionably out of balance. Similarly provision is made with respect to the lower looper carrier 12 whereby its looper receiving arm 42 is positioned for movement in a path parallel to and between planes defined respectively by opposite ends of the cam roll 39. To effect this arrangement the lower looper carrier 12 is formed of a web portion 40 having laterally merged therewith the pivotal hub 41, pivotal bearing stud 38, and looper carrying arm 42 with the axes of the hub and stud substantially at right angles to the web and with the longitudinal axis of the arm non-radial to the hub and stud axes but extending between and substantially in parallelism with planes which are at right angles to the axis of the stud and coincident respectively with the base and end thereof, said hub, stud, and looper carrying arm or socket being triangularly disposed about the web. With this carrier mounted upon its supporting stud 36, which associates it with the frame cap 4, and with the latter secured to the machine frame, the upper portion of the web of the carrier is closely adjacent the periphery of the lower cam cylinder, with stud 38 in cam groove 14, and the looper carrying arm 42 beyond and in proximity with and opposite to the end of said cam cylinder, the stud 38 and looper carrying arm 42 being intermediate the planes defined by ends of the cam roll 39 as explained but separated by a space appropriate to receive that portion of the cam cylinder between the cam groove and the cam cylinder end wall. Like the upper looper and its carrier, the lower looper and its carrying arm are entirely maintained between planes coincident respectively with the base and end of the cam roll stud associated therewith.

The lower looper carrier arm is drilled to form a socket for the looper shank, and intermediate the ends of the arm, opposite a slight enlargement thereof, a tapped hole is provided in the web portion 40 of a set screw as 45, with which to secure the looper. Near the end of the looper receiving socket opposite the free extremity of arm 42 a transversely directed pin 46 is provided to form a locating stop against which to set the looper to establish its correct relation with respect to the other stitch forming implements. Intermediate the triangularly disposed features of the lower looper carrier, referred to above as merging with the web portion 40, the latter may be apertured as shown at 47 to reduce weight of the part without materially affecting its strength or stability. To increase rigidity of the carrier laterally the web portion between the hub and looper receiving arm may be provided with a rib or flange 48.

Having thus described my invention, what I claim is,—

1. An overseaming machine including in combination, a reciprocatory needle, a pair of cam cylinders supported for rotation in parallelism within the machine frame, a frame cap adjacent to the cam cylinders, a reciprocatory slide mounted on the frame cap, a looper carrier pivoted to the slide with its pivotal axis in a plane extending between the cam cylinders, said looper carrier having two arms, each of which is provided with a bearing stud to engage a groove in a respective cam cylinder, a second looper carrier pivoted to the frame cap and having a bearing stud to engage another groove in one of the cam cylinders, each of the looper carriers also having a looper arm aligned with the paths of movement of the several bearing studs, with the looper arm of the slide supported carrier operable in a space between the cam cylinders and with the bearing stud and looper arm of the other carrier separated by a space appropriate to receive that portion of the cam cylinder between the groove for said stud and an end wall of the cylinder.

2. Looper mechanism including in combination, a pair of cam cylinders rotatable in parallelism, and an upper and lower looper carrier operably supported adjacent said cam cylinders, the upper looper carrier having two arms, each of which is provided with a bearing stud to engage a groove in a respective cam cylinder, and the lower looper carrier having a bearing stud to engage another groove in one of the cam cylinders, each of the looper carriers also having a looper arm aligned with the paths of movement of the several bearing studs, with the upper looper arm operable in a space between the cam cylinders, and with the bearing stud and looper arm of the lower looper carrier separated by a space appropriate to receive that portion of the cam cylinder between the goove for said stud and an end wall of the cylinder.

3. Looper carrier mechanism including in

combination, a cam cylinder rotatable about its longitudinal axis and having a cam surface laterally disposed relative to an end wall of the cylinder, and a looper carrier operatively associated with the cam cylinder and provided with a cam stud or follower and a looper carrying arm that are movable along paths falling between planes coincident with the ends of said stud but separated by a space appropriate to receive that portion of the cylinder between the cam surface and an end wall of the cylinder.

4. A looper carrier comprising an apertured web portion having laterally merged therewith a pivotal hub, a pivotal bearing stud, and a looper socket arm, with the axes of the hub and stud substantially at right angles to the web and with the longitudinal axis of the arm non-radial to the hub and stud axes but extending between and substantially in parallelism with planes which are at right angles to the axis of the stud and coincident respectively with the base and end thereof, said hub, stud, and looper socket arm being triangularly disposed about the aperture.

5. A looper carrier comprising a web portion having laterally merged therewith a pivotal hub, a pivotal bearing stud, and a looper socket arm, with the axes of the hub and stud substantially at right angles to the web and with the longitudinal axis of the arm non-radial to the hub and stud axes but extending between and substantially in parallelism with planes which are at right angles to the axis of the stud and coincident respectively with the base and end thereof, said hub, stud, and looper socket arm being triangularly disposed about the web.

6. A looper carrier comprising a web portion having laterally merged therewith a pivotal hub, a pivotal bearing stud, and a looper socket arm, with the axes of the hub and stud substantially at right angles to the web and with the longitudinal axis of the arm non-radial to the hub and stud axes but extending between and substantially in parallelism with planes which are at right angles to the axis of the stud and coincident respectively with the base and end thereof.

JOSEPH M. MERROW.