S. W. AVIS.

OVERSEAMING MACHINE.

APPLICATION FILED DEC. 12, 1914.

1,217,896. Patented Mar. 6, 1917.

Fig. 1.

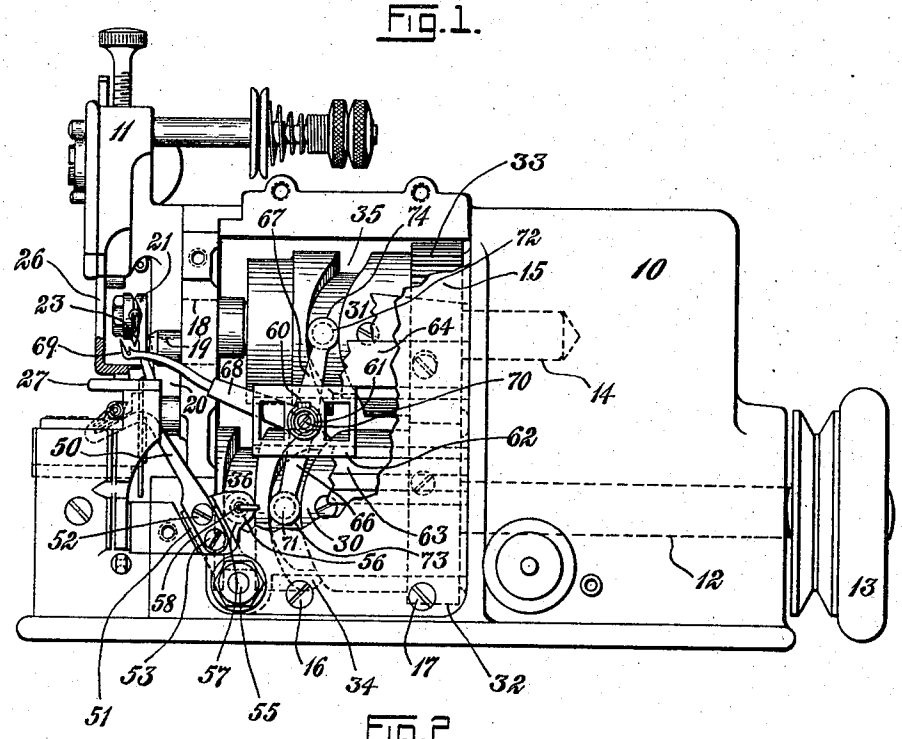
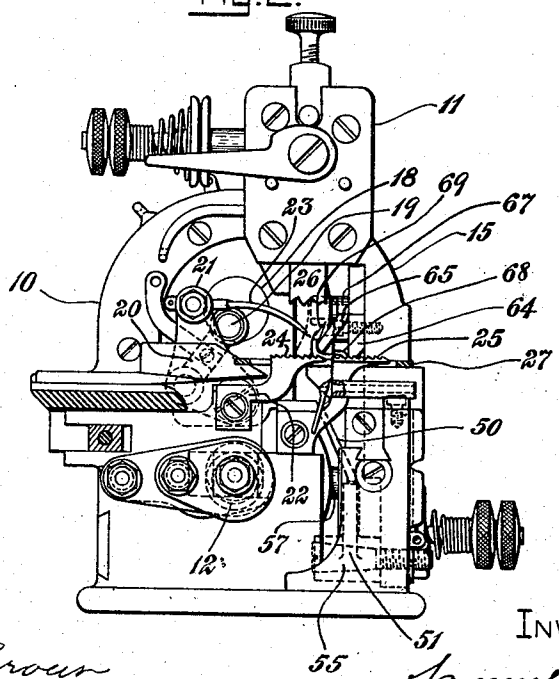


Fig. 2.



WITNESSES:

Halbert R. Brown

Francis E. Ruth

INVENTOR:

Samuel W. Avis

BY Church & Church

his ATTORNEYS.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

SAMUEL W. AVIS, OF HARTFORD, CONNECTICUT, ASSIGNOR TO THE MERROW MACHINE COMPANY, OF HARTFORD, CONNECTICUT, A CORPORATION OF CONNECTICUT.

OVERSEAMING-MACHINE.

1,217,896. Specification of Letters Patent. Patented Mar. 6, 1917.

Application filed December 12, 1914. Serial No. 876,917.

To all whom it may concern:

Be it known that I, SAMUEL WALTER AVIS, 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 letters of reference thereon.

This invention relates to overseaming machines and especially, to that class of machines including a thread carrying needle and two thread carrying loopers in the stitch forming mechanism, in which the loopers or either of them may be provided with an eye or closed thread passage or an open throat for the thread as is common in overseaming machines.

This invention particularly relates to the operation of the loopers and has for its object the general increase of efficiency and speed of the machine.

This invention is illustrated as embodied in a form resembling and akin to, that shown and described in U. S. Patent No. 591,049 but is different in mode of operation and details of construction. In machines of the type shown in the above mentioned patent the lower looper makes two horizontal reciprocations for each reciprocation of the needle and can coöperate with the needle at only one of said reciprocations; and the upper looper reciprocates above, around the edge of and below the needle plate once for each reciprocation of the needle and coöperates with the lower looper once for two reciprocations of the latter, the two loopers being so connected and related that the horizontal movements of the two loopers are mutual.

According to the present invention the two loopers are supported and actuated independently thus dispensing with one of the reciprocations of the lower looper and avoiding the requirement that the upper looper shall reciprocate under the needle plate.

In the accompanying drawings Figure 1 is a front elevation of a machine embodying my present invention portions of the machine being shown as broken away and portions being removed for the purpose of better displaying the mechanism.

Fig. 2 is an elevation of the machine looking from the left end of Fig. 1, parts being broken away and the needle plate being in section.

Throughout the several figures of the drawings like characters of reference indicate the same parts.

In the drawings 10 indicates the frame of the machine, 11 the head, 12 the main shaft, 13 the driving pulley, 14 the upper shaft parallel with the lower shaft, and 15 the frame cap which supports the looper carriers and is secured to frame 10 by means of the screws 16 and 17.

The cam cylinders 30 and 31 are secured respectively to the main shaft 12 and the upper shaft 14 the said cam cylinders being provided with intermeshing gears 32 and 33 whereby the two cam cylinders and the upper shaft revolve in unison when the lower or main shaft is rotated.

The cam cylinders 30 and 31 are provided respectively with correlated cam grooves 34 and 35 for actuating the upper looper and the lower cam cylinder 30 is provided with an additional cam groove 36 for actuating the lower looper as will be more fully explained hereinafter.

The outer or left hand end of the upper shaft 14 is provided with an enlargment 18 which carries a wrist pin 19 running in one end of the connection 20 the other end of which connection is operatively secured to the needle carrier 21 which is pivotally secured to the frame of the machine upon the screw stud 22 and carries the eye pointed needle 23 which latter is suitably reciprocated upon its stud at each revolution of the cam cylinders. The machine is provided with two separately operated feed dogs 24 and 25 and contains the usual presser foot 26 and needle plate 27 and is provided with tensions, takeups and thread guides.

The needle plate is usually provided with a finger around which the stitches are formed as is common in overseaming machines.

The upper cutter and its carrier have been removed to better display the present invention. The work plate is not shown as it is thought that the needle plate is a sufficient work support for illustrative purposes.

The lower looper 50 is secured to its carrier 51 by means of the screws 52 and 53, and is operatively supported upon the stud 55 which latter is secured to the frame cap 15 practically in a line vertically below the cam groove 36.

The lower looper carrier 51 is provided with a stud 56 surrounded by a roll 57 which fits into the cam groove 36 by means of which the looper 50 is oscillated below the needle plate 27 passing the needle 23, when the latter is at or near its lowest position, in moving outward, (toward the right in Fig. 1) across the path of the upper looper. The takeup 58 is preferably carried by the lower looper carrier, to act upon the lower looper thread, when the lower looper is provided with an eye for carrying a thread, as is represented in the drawings.

The groove 36 in the cam 30 for operating the lower looper 50 is made irregular in form so that it will cause the lower looper to pass the needle rapidly in order to facilitate its entrance of the needle thread loop, and, after the upper looper in its upward movement has passed the lower, to cause the latter to recede rapidly so as to withdraw early from the needle thread loop previously taken and to return to its position at the left of the needle before the latter in its downward movement passes its point below the needle plate, thus obviating the possibility of the point of the needle penetrating or disarranging the thread with which the lower looper may be provided. The lower looper is then permitted to dwell until the needle is at or near its lowest position when the said looper again advances rapidly to enter the needle thread loop as before. This irregular movement of the lower looper is made to coöperate with and accommodate the movement of the upper looper, the variation in speed and time of travel also permit of a short throw of the lower looper, enhances the speed of the machine and is desirable in the formation of the stitches.

The upper looper carrier 60 is pivotally supported at 61 upon the sliding block 62 which is movable horizontally in a raceway provided by the inner face of the frame cap 15, the lower gib 63 and the upper gib 64.

A back guide 65 (removed in Fig. 1—shown in Fig. 2) is secured to the frame cap 15 and forms a lateral support for the upper looper carrier 60 on its rear side.

The upper looper carrier 60 is formed with two arms 66 and 67 extending equally from the pivotal support 61; and is provided with a lateral arm 68 for supporting the upper looper 69 which is secured to its carrier by the screw 70 located in the pivotal support 61. The upper looper carrier is also provided with two studs 71 and 72 surrounded by cam rolls 73 and 74 which respectively fit into the cam grooves 34 and 35 by means of which the looper carrier is oscillated upon its pivotal support and is also reciprocated bodily horizontally with the sliding block 62 whereby the upper looper 69 is reciprocated in a path above the needle plate beyond the path of the needle and around the edge of the needle plate to a point below the said needle plate and across the path of the lower looper 50 but preferably not under the needle plate.

In operation, as the hand wheel is turned, the cam cylinders revolve, the upper shaft rotates, reciprocating the needle, the lower looper, coöperating 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 coöperating with the needle above the needle plate. Thus the lower looper coöperates with the needle and and the upper looper, which latter in turn coöperates 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.

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 returns beyond the path of the needle, ready for its next advance.

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.

In the arrangement shown the loopers

and looper carriers are entirely supported upon the frame cap 15 which may be removed from the machine complete with the looper carriers and their supports for examination or adjustment.

Having thus described my invention, I now claim—

1. In an overseaming machine and in combination with a reciprocating needle, a needle plate and feeding mechanism; a looper and a carrier therefor supported to oscillate and to reciprocate bodily in a right line, a pair of grooved cam cylinders for actuating said looper and its carrier, a second looper with its carrier pivotally supported and actuated by an irregular groove in one of said cam cylinders whereby the needle and the two loopers coöperate to form overedge stitches.

2. In an overseaming machine and in combination with a reciprocating needle, and means for supporting and feeding the material, a lower oscillating looper carrier, an upper looper carrier pivoted and supported to reciprocate bodily, in a straight line and also to oscillate, a pair of rotating cam cylinders arranged in proximity to each other, said cam cylinders being provided with two correlative grooves for actuating the upper looper and an irregular groove for actuating the lower looper whereby the path of the lower looper intersects the paths of the needle and of the upper looper, and the path of the upper looper intersects the paths of the lower looper and of the needle, to carry thread to produce overedge stitches.

3. In an overseaming machine including a reciprocating eye pointed needle and in combination, a lower looper with its carrier pivotally supported, an upper looper with its carrier pivotally and slidably supported, a pair of cam cylinders supported in proximity with each other and geared to rotate in unison, a cam groove in each of said cylinders engaging corresponding studs upon the upper looper carrier; and a second groove irregular in form in one of said cam cylinders engaging a stud upon the lower looper carrier whereby the loopers coöperate with each other and with the needle.

4. In an overseaming machine including a reciprocating eye pointed needle and means for supporting and feeding the fabric and in combination therewith; a pair of cam cylinders provided with intermeshing gear teeth, and three correlated cam grooves, an upper looper with its carrier pivotally and slidably supported, and supplied with studs and rolls to engage two of said cam grooves, a lower looper with its carrier pivotally supported and provided with a stud with a roll adapted to engage one of the grooves in one of the said cam cylinders whereby the lower looper is intermittently moved to co-act with the needle and upper looper and the upper looper coacts with the lower looper and the needle in transferring loops of thread to produce overedge stitches upon the edge of the material.

5. In an overedge sewing machine including a needle, and means for supporting and feeding the fabric and in combination therewith, a frame cap secured to the frame of the machine, two loopers and means to actuate them to coöperate with each other and with the needle, both of said loopers being independently supported upon said frame cap, whereby the loopers together with their supports may be removed from the frame of the machine for inspection and adjustment.

6. In an overseaming machine and in combination, a reciprocatory needle, a pair of cam cylinders supported within the machine frame, a frame cap contiguous to said cam cylinders, a reciprocatory slide mounted on the frame cap, a looper pivoted to said slide, and a second looper pivoted to the frame cap, reciprocation of the slide and oscillation of the looper carried thereby being effected by two correlated cam grooves in the cam cylinders, and oscillation of the second looper being effected by a single cam groove in one of the said cam cylinders.

7. In an overseaming machine and in combination with a reciprocating needle, and means for supporting and feeding material, a looper and a carrier therefor supported to oscillate and to reciprocate bodily in a right line, a pair of grooved cam cylinders for actuating said looper and its carrier, and a second looper with a fulcrumed carrier therefor having intermediate said looper and fulcrum means adapted to engage an irregular groove in one of said cam cylinders for actuating said second looper.

SAMUEL W. AVIS.

Witnesses:
FRED W. SPELLMAN,
F. E. ANDERSON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."