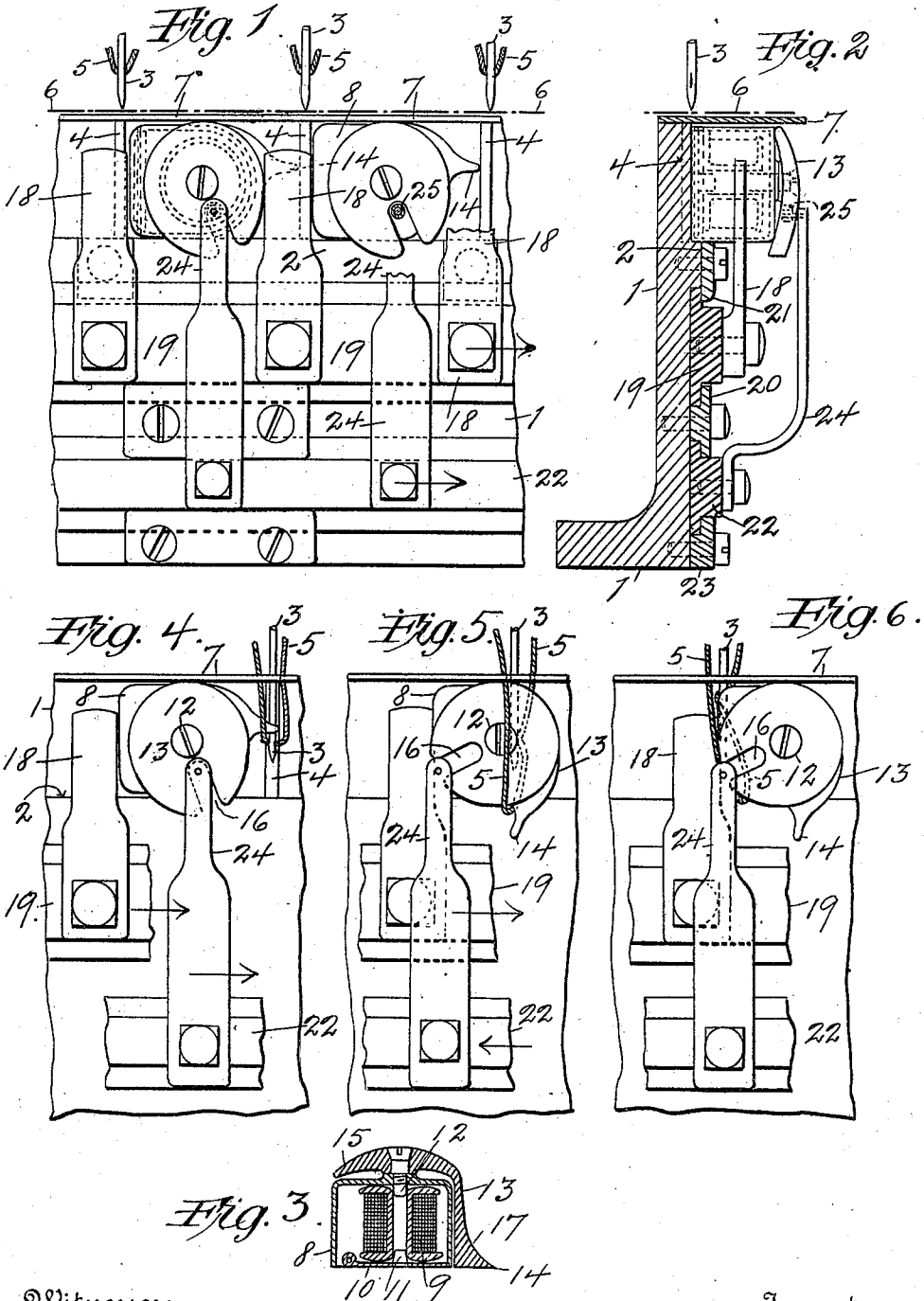


M. SCHOENFELD.
SHUTTLE MECHANISM FOR EMBROIDERING MACHINES.
APPLICATION FILED APR. 4, 1910.

996,285.

Patented June 27, 1911.

3 SHEETS—SHEET 1.



Witnesses:
Edward D. C. Sperry.

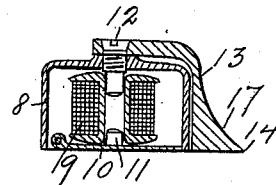
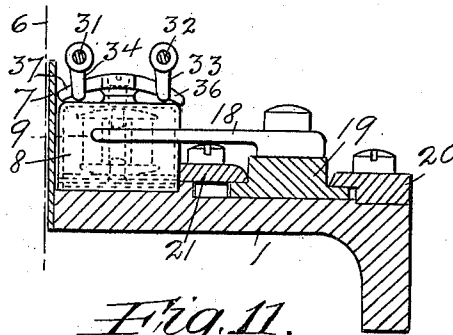
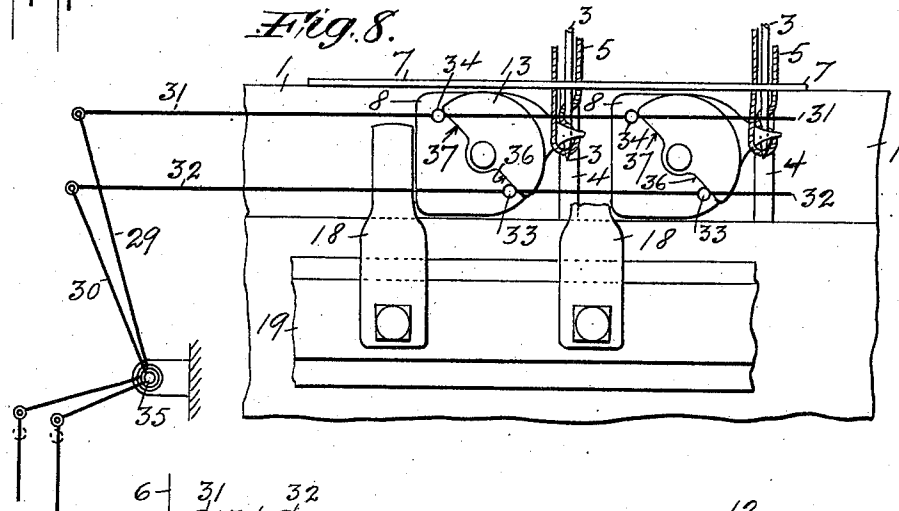
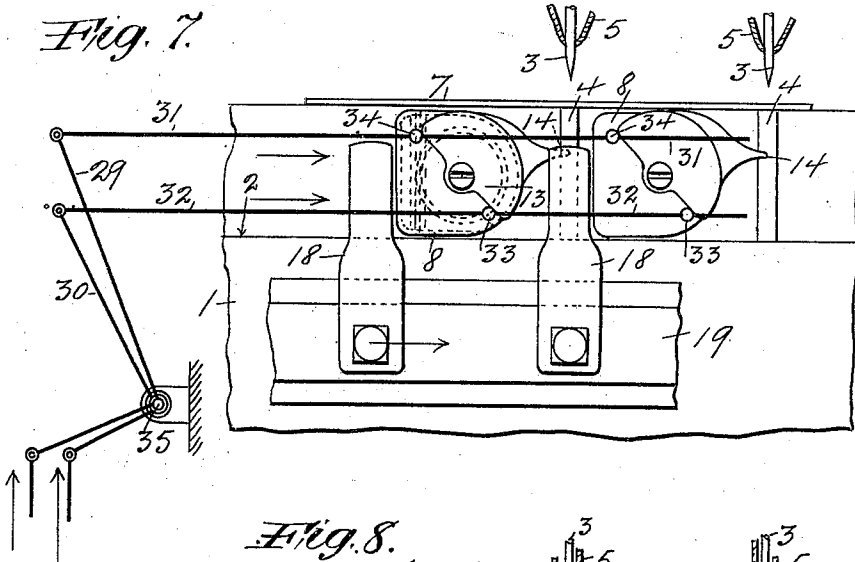
Inventor
Morris Schoenfeld
By his Attorney
Charles S. Newell.

M. SCHOENFELD.
SHUTTLE MECHANISM FOR EMBROIDERING MACHINES.
APPLICATION FILED APR. 4, 1910.

996,285.

Patented June 27, 1911.

3 SHEETS—SHEET 2.



Witnesses:
Edward D. C. Sperry.

Inventor
Morris Schoenfeld
By his Attorney
Charles E. Hensley

M. SCHOENFELD.
SHUTTLE MECHANISM FOR EMBROIDERING MACHINES.
APPLICATION FILED APR. 4, 1910.

996,285.

Patented June 27, 1911.

3 SHEETS—SHEET 3.

Fig. 9.

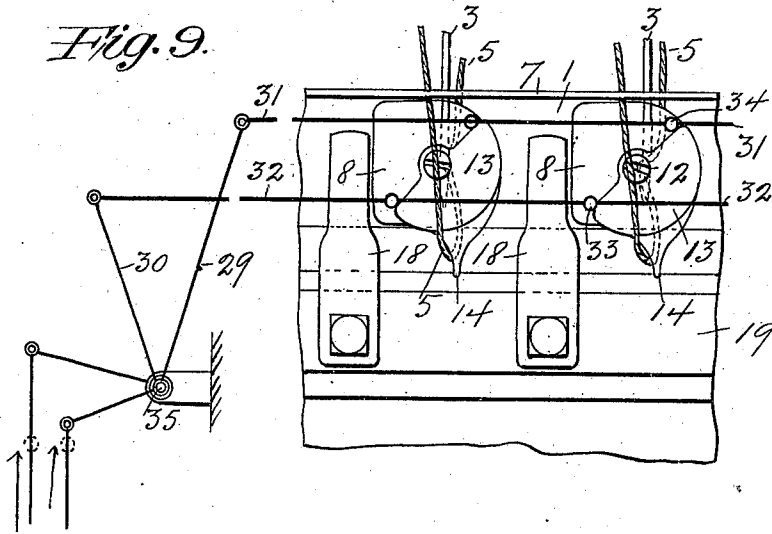
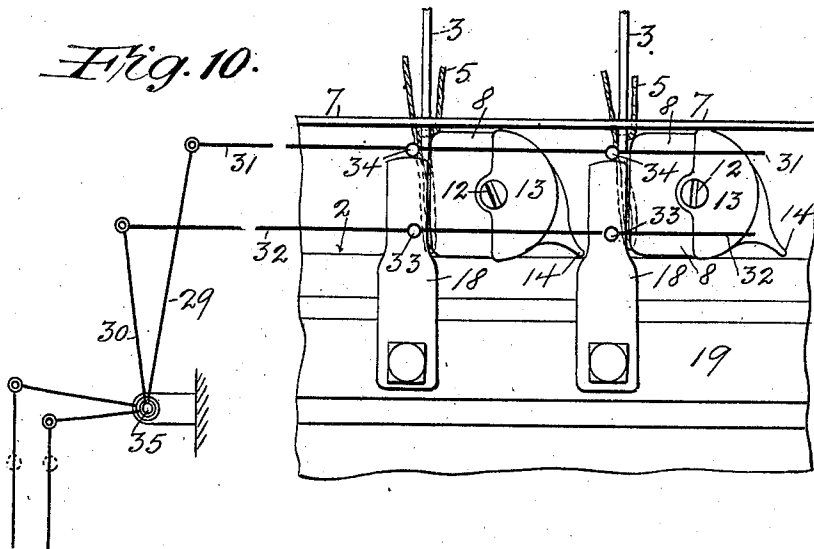


Fig. 10.



Witnesses:
Edward D. Sperry.

Inventor
Morris Schoenfeld
By Attorney
Charles E. Newley

UNITED STATES PATENT OFFICE.

MORRIS SCHOENFELD, OF RORSCHACH, SWITZERLAND.

SHUTTLE MECHANISM FOR EMBROIDERING-MACHINES.

996,285.

Specification of Letters Patent. Patented June 27, 1911.

Application filed April 4, 1910. Serial No. 553,165.

To all whom it may concern:

Be it known that I, MORRIS SCHOENFELD, a citizen of the United States, and a resident of Rorschach, in the Canton of St. Gall, Switzerland, have invented certain new and useful Improvements in Shuttle Mechanism for Embroidering-Machines, of which the following is a specification.

The present invention relates to the stitch forming parts of an embroidering machine and more particularly to the shuttle mechanism.

The object of my present invention is to make it possible to use shuttles much larger than heretofore and to do so I have utilized a catcher which enters the loop of the thread as it is brought through the fabric by the needle and by an action in addition to the usual movement of the shuttle the catcher enlarges the thread loop sufficiently to permit the shuttle to pass through.

Heretofore an enlargement of the shuttle beyond certain limits has been impracticable as an increase in the length of the shuttle materially decreased the working possibilities of the machine by decreasing the number of the needles which it was possible to place within the longitudinal limitations of the machine; while to increase the shuttle in width was more or less limited by the length of the shuttle because a too large increase in the width from the nose of the shuttle would make it impossible to get the shuttle through the loop speedily. By increasing the size of the shuttle it is possible to use larger bobbins with a correspondingly larger supply of thread and the shuttles will not require replenishing so often; and this in a machine employing hundreds of needles is an important factor.

In my improved mechanism I employ an element which lies near the nose of the shuttle and engages in the loop of the thread as it is formed by the needle. This element is then given a movement which enlarges the loop in the thread and permits the larger shuttle to pass through the loop.

My invention may be carried out in several forms, in which the shuttles travel on longitudinal tracks or upright tracks and the details of the mechanism are susceptible of modification.

Other advantages will appear from the detailed description of an embodiment of my invention hereinafter.

In the drawings forming a part of this application, Figure 1 is a plan view of the stitch forming elements of an embroidering machine, showing my improved shuttle mechanism in one form, in which the shuttles travel in longitudinal shuttle tracks, Fig. 2 is an end view of Fig. 1, showing the parts in cross section, Fig. 3 is a section through one of the shuttles, Figs. 4 to 6 are views similar to Fig. 1, showing the parts in the different positions during the operation thereof, Figs. 7 to 10 are plan views of the shuttles driven by a modified form of mechanism, Fig. 11 is an end view of the preceding construction, showing the same in cross section, Fig. 12 is a cross section of one of the shuttles used in this modified construction.

The mechanism consists primarily of a shuttle or set of shuttles and for each shuttle there is a catcher which engages the thread near the nose of the shuttle, preferably before the latter itself enters the loop of the thread and moves preferably in an oscillatory action to open the thread loop sufficiently to permit the shuttle to pass freely through the thread loop; and mechanism for operating the shuttle and the catcher. The catcher I have termed the element for opening the loop, may be operated by different forms of mechanism, of which several examples are herein shown. The exact moment at which the catcher enters the loop may differ under the broad scope of my invention but I prefer to so dispose the catcher that its end will lie close to the nose of the shuttle and will enter the loop just before the shuttle begins to pass through the loop. The catcher is then operated to open the loop either while the shuttle is passing there-through or it may complete its opening action before the shuttle enters the loop.

I will first describe the form of my invention as embodied in Figs. 1 to 6. The shuttle and various parts I have shown supported upon a stationary support or carrier 1, which is rigidly and longitudinally mounted upon the embroidering machine; and the needles 2, which are arranged in longitudinal rows upon the machine in the usual way work in and out of the needle channels 4 of the carrier 1, and in doing so they carry the threads 5 through the fabric 6 which is stretched upon a tambour frame before the various needles in the usual way.

The track for guiding the various shuttles in this form of my invention I have shown formed of a guiding plate or flange 2, projecting from the carrier 1, and a needle plate 7 attached to the edge of the carrier 1, and which is provided with apertures for the needles to pass therethrough into the needle channels 4. For each needle I have provided, in this form, a shuttle consisting of a casing 8, which is preferably of rectangular form and shaped to work in the track formed by the carrier 1, the flange 2, and the needle plate 7. The bobbin 9, carrying the thread of the shuttle is shown disposed across the shuttle and mounted to turn on a pin 11 on the hinged cover 10 of the shuttle and the pin 12. Each shuttle is provided with a catcher and, in the form now under consideration the catcher consists of a plate 13 which is secured to the exterior of the shuttle by means of the screw 12; and it has a reduced point 14 so disposed that it will enter the loop of the thread 5 as the latter is formed by the needle and preferably to one side of the shuttle, in this form; and this plate or catcher gradually curves at 17 to open the thread loop as the catcher is oscillated. The catcher plate 13 passes partly around the shuttle and is provided with a part 15 which has a radial slot 16. The connection of the catcher with the shuttle is such that the former may oscillate freely about the latter and I prefer in all forms of my invention to connect the catcher with the shuttle so that it travels therewith and in such a fixed relation that the catcher and shuttle will properly cooperate with each other in action.

The shuttle is driven longitudinally in the shuttle track, that is, between the carrier 1, the flange 2, and the needle plate 7, by means of a shuttle drive bar 19 which is common to the shuttles of a row, by means of the shuttle drive arms 18 which are arranged on the bar 19 in such a way that there will be a drive arm engaging on opposite ends of each shuttle as shown in Fig. 1.

The shuttle drive bar travels between the guides 20 and 21, which are mounted on the carrier 1 and the mechanism for operating the drive bar may be such as is usually employed for operating drive bars, or such as will be readily understood by those skilled in the art, it being necessary simply to impart a reciprocating movement to the drive bars. There is another drive bar 22, which travels between the guides 20 and 23, similar to the shuttle drive bar and any mechanism is employed to operate the same to move it as indicated in the drawings and which will be understood by those skilled in the art. This drive bar is provided with an arm 24 for each catcher, whereby the bar is common to the several catchers of a row and these arms are provided with a roller 25 on their upper

ends which are so positioned that they will engage in the radial slots 16 in the several catchers.

The action of the first form of my invention will be readily understood from the drawings. The bars 19 and 22 advance to the right in the figures, both at the same speed, immediately after the needles have passed through the fabric and into the needle channels, until the engaging end 14 of the catcher enters the loop of the thread near the needle as shown in Fig. 4. The point 14 will then take in the thread loop and the catcher is then ready to be oscillated to open the thread loop sufficiently to allow the shuttle to pass therethrough without having to make a long shuttle with a very long nose, as would be the case with prior constructions. During the movement of the drive bar 22 to the right the roller 25 was traveling in the slot 16 of the catcher. The direction of movement of the drive bar 22 is now reversed and is made to travel to the left in the drawings and the result will be that the roller 25 will act upon the catcher to rotate the latter upon its axle when the loop of the thread which was engaged by the end 14 of the catcher will be opened. At the same time the bar 19 continues to move in its first direction, to the right, and the enlargement of the loop by the catcher makes way for the passage of the shuttle. The shuttle will finally pass through the thread loop and slightly beyond the extreme movement of the engaging fingers 24, so that the thread can pass between the shuttle and the roller 25. The thread is now drawn up by the action of the take up and the shuttle is ready to be returned to its first position for the next stitch. When the shuttle drive bar is reversed in direction the shuttle will move to the left and the roller 25 will reengage in the radial slot 16 of the catcher and thereafter the shuttle drive bar and the catcher drive bar will be returned to the first or starting position when the shuttle and catcher will be ready to make the same action for the next stitch and the movement is so continued during the stitching operation of the machine.

It will be apparent that quite large shuttles may be used and they can be placed close together and their action may be very rapid without in any way decreasing the quality of the work over that heretofore produced in former machines.

In Figs. 7 to 12 I have shown still another way of operating the catcher. In this form the shuttles may remain as in the first form, and the shuttle drive is the same. The catcher and its operating mechanism are however changed to produce the same result as heretofore but in a different way. Here I have shown two bellcrank levers 29, 30, suitably mounted to rock upon fulcrums 35

and they are operated in any well known manner, as for instance by cams on the shaft of the machine. The cams are not here shown as they will be obvious to any one skilled in the art and they will be apparent from the requirements of the mechanism which they are to operate. These bellcrank levers have long rods 31, 32, fulcrumed to their upper ends, each of which is provided with an engaging pin 33, 34, the former engaging the edge 36 on one side of the axle of the catcher and the latter engaging on the edge 37 on the other side of the axle. To this extent the catcher is modified over the first form, as shown in Fig. 12. The parts before the stitching begins are in the position shown in Fig. 7. When the needle advances through the fabric the bellcrank levers are moved to the right, when the pins 33, 34, on the rods 31, 32, will move the catcher forward with the shuttle without any oscillation until the nose of the catcher engages in the loop of the thread as shown in Fig. 8; and then the bellcrank lever 29 and its rod 31 are given an additional movement as shown in Fig. 9 and the bellcrank lever 30 and its rod 32 are given a reverse movement, thus causing the catcher to be oscillated to open the loop of the thread and let the shuttle pass through the loop. When the catcher has been sufficiently oscillated the shuttle passes on through the loop, as shown in Fig. 10 and the loop is then taken up by the action of the take up. The shuttle is then returned to its original position and the bellcrank levers are also returned when the parts are in a position ready for the next stitch.

Many changes may be made in the form

and operation of the mechanism without departing from the broad spirit of my invention.

Having described my invention what I claim is:

1. A stitch forming mechanism comprising a sewing needle, a shuttle track and a reciprocating shuttle adapted to cooperate with the needle, a shuttle drive adapted to reciprocate the shuttle, an oscillating catcher carried by the shuttle, and adapted to engage and enlarge the thread loop for the passage of the shuttle, means reciprocating independent of the shuttle movement and adapted to engage and oscillate the said catcher in addition to the reciprocating movement caused by the shuttle drive, and means for operating said reciprocating means.

2. A stitch forming mechanism comprising sewing needles, a shuttle track and reciprocating shuttles adapted to cooperate with the needles, a shuttle drive adapted to reciprocate the shuttles, an oscillating catcher carried by each of the shuttles and adapted to engage and enlarge the thread loop for the passage therethrough of the shuttle, each of said catchers having a slot, pins engaging and disengaging in said slots and means for imparting a movement to said pins generally reverse to the shuttle driving movement, whereby said catchers will be oscillated.

Signed at the city of Rorschach, in the Canton of St. Gall, Switzerland, this 24th day of March, 1910.

MORRIS SCHOENFELD.

In the presence of—
FRIEDR. STEINER,
EDGAR LOCH.