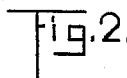
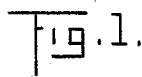


J. M. MERROW.
SEWING MACHINE.

No. 540,675.

Patented June 11, 1895.



WITNESSES. —

William H. Stedman

John A Cross

INVENTOR

Joseph W. Merriam

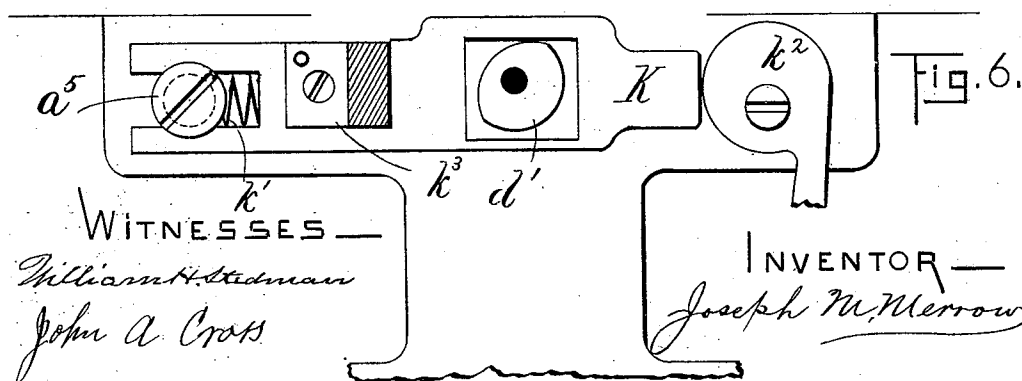
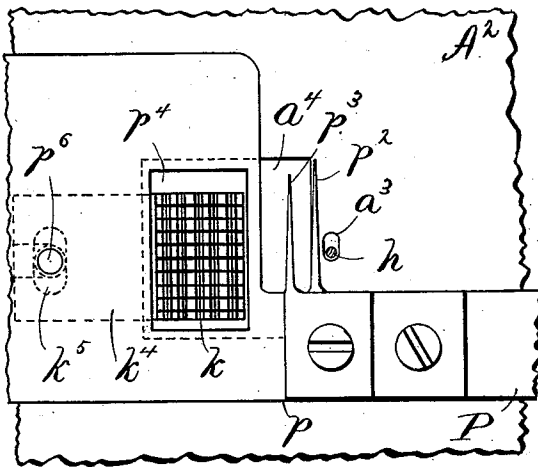
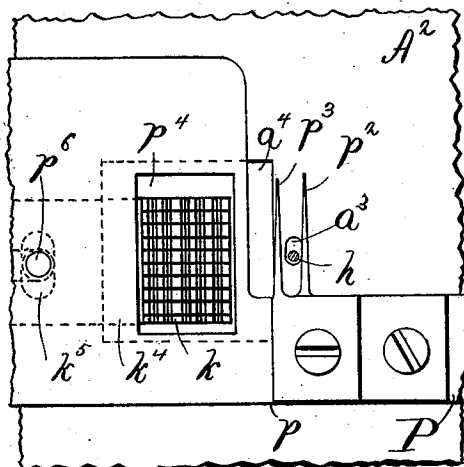
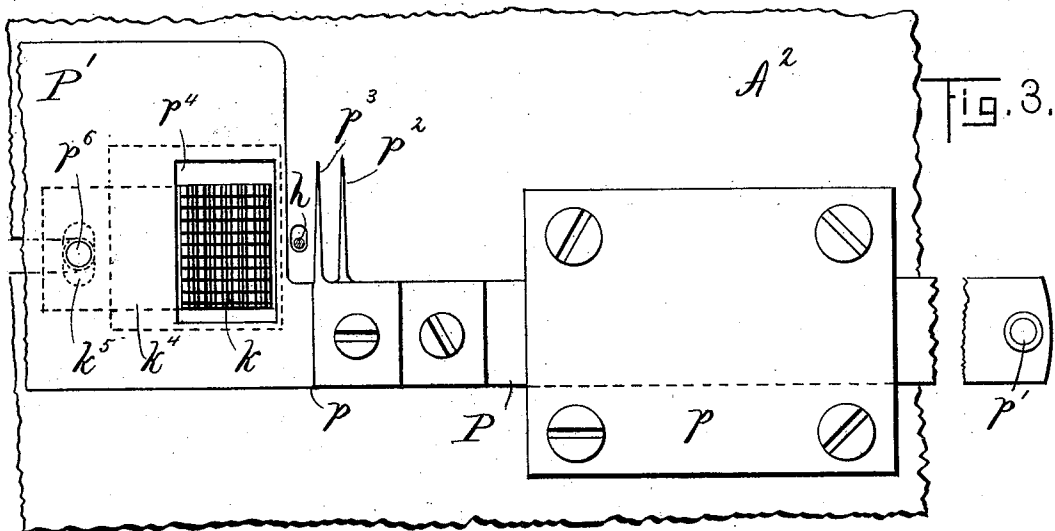
(No Model.)

2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

JOSEPH M. MERROW, OF MANSFIELD, CONNECTICUT.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 540,675, dated June 11, 1895.

Application filed November 20, 1888. Serial No. 291,317. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH M. MERROW, a citizen of the United States, residing at Merrow, in the town of Mansfield, county of Tolland, and State of Connecticut, have invented new and useful Improvements in Sewing-Machines, of which the following is a specification.

My invention relates particularly to embroiderying mechanism.

My object is to form ornamental borders upon the edges of fabrics in accordance with what I believe to be a new and improved method, and my invention consists in means for attaining such object as will be herein fully explained.

In the drawings forming a part of this specification, Figure 1 is a side elevation of the machine, parts being broken away to show the mechanism. Fig. 2 is an enlarged view of a portion of the left end of the machine, showing the feeding mechanism and looper. Fig. 3 is an enlarged plan of a portion of the work-plate and attachments. Figs. 4 and 5 are also enlarged plan views of smaller portions of the work-plate and attachments. Fig. 6 is an enlarged view of a portion of the left end of the machine, showing the feed-cam and a portion of the feed-bar.

Similar letters of reference indicate corresponding parts throughout the illustrations.

A, indicates the bed of the machine; A', the standard; A², the work-plate; B, the needle arm; C, the needle lever; D, the shaft; E, the driving wheel; F, the eccentric; G, the connecting rod; H, the needle spindle; I, the presser foot spindle; J, the presser foot; d, the looper; K, the feed bar; k, the feed dog, and h the needle.

L, M, m, and N, indicate spur gears.

O, indicates a pattern cam; P, a sliding bar; P', a guard plate; p, a cap for the bar P; p', a cam pin, and p² and p³, indicate two fingers.

The driving shaft D, is journaled in the machine, through the standard A', and the bearing A³, and is adapted to be rotated by the application of any convenient power to the outer end of said driving shaft. The needle h, is secured to the lower end of the needle spindle H, which latter is operatively supported in suitable bearings in the needle arm

B, and is loosely connected to the needle lever C, by means of a pin or screw h'. The needle lever C, is pivoted to the needle arm B, upon a stud b, and is provided with a ball c, which extends into a hole in the upper end of the eccentric rod G, the lower portion of which surrounds the eccentric F, attached to the driving shaft D. The looper d, is secured to the driving shaft D, and rotates with the latter. The spur gear L, is secured to the driving shaft D, and meshes into the spur gear M, which latter is adapted to rotate upon its stud a, secured to the standard A'. Secured to the gear M, is the gear m, which meshes into the gear N. One end only of gear m is shown in Fig. 1 as said gear is situated on the opposite side of gear N where it engages the latter. Formed on or secured to the spur gear N, is a cam cylinder O, which together with said gear N, is operatively supported upon the stud a', secured to the standard A', and said cam cylinder is provided with an irregular groove o, into which extends the cam pin p', secured to the sliding bar P, which latter is operatively held within a groove or channel in the work-plate, by means of the cap p. The guard plate P', is made integral with or secured to the sliding bar P, and is provided with an opening p⁴, through which the feed dog k, operates. The fingers p², and p³, are adjustably secured to the sliding bar P. The work plate A², is provided with a small opening a³, for the passage of the needle h, and a larger opening a⁴, for the feed dog k. The feed bar K, is operatively held to its support by means of the screw a⁵, and is carried upward and forward by means of the cam or eccentric d', which is attached to the driving shaft D. The downward movement of the feed bar K, is effected by its own gravity and by the action of the feed cam d', while the backward motion is imparted to the said feed bar by the coiled wire spring k', and the extent of its backward motion is limited by the eccentric stop k². The feed dog support k³, is secured to the side of the feed bar K, and said support is provided with a dovetailed channel extending across its upper side at a right angle to the line of travel of the feed bar as the latter moves forward or backward. The feed dog k, has a roughened upper surface and its lower side conforms with the upper side of

its support k^3 , in which said feed dog is adapted to slide. The feed dog k , is provided with an extension k^4 , near the outer end of which is a slotted hole k^5 , into which extends the pin p^6 , which is secured to the guard plate P' . The spur gear L , is several times smaller than the gear M , into which it meshes and again the spur gear m , attached to the gear M , is several times smaller than the gear N , into which latter the said spur gear m , meshes and to which is secured the cam cylinder O . Said cam cylinder is therefore rotated much more slowly than the shaft D . The irregular groove o , in the cam cylinder O , is made of such form as to hold the sliding bar P , stationary while the needle h , is carried down through the work plate and until said needle is raised above the work plate when said cam groove operates to slide said bar P , carrying the fingers p^2 , and p^3 , as will be more fully explained.

In the operation of the machine, the needle is provided with thread and the fabric is placed over the guard plate upon the work plate and under the presser foot with its edge adjacent to the shoulder p^5 , of the sliding bar P , and against the outer side of the finger p^3 , when said finger is in the position shown in Figs. 1 and 3. By the application of any convenient power to the driving wheel, the driving shaft is rotated, carrying with it the eccentric which operates the eccentric rod, the needle lever, needle spindle and needle which latter carries the thread down through the fabric and a loop of the thread is taken from the side of the needle, by the looper which rotates with the driving shaft.

As the machine is further operated, the needle is raised above the fabric, when the latter is fed along by the action of the feed dog. Each time the needle passes through the fabric the loop of thread previously taken by the looper is carried into such a position by the looper that the point of the needle passes through said loop which is released by the action of the looper and another loop grasped by said looper as before which loop is drawn through the loop previously made thus forming the single chain stitch in a manner common in sewing machines and well understood by those acquainted with such machinery.

When the needle is raised out of the fabric (from the position shown in Fig. 1) by the operation of the machine, the sliding bar P , carrying the fingers p^2 , and p^3 , the guard plate P' , and feed dog together with the fabric are moved one step to the left by the action of the cam groove o , and when the needle next descends through the work plate, said needle passes between the two fingers p^2 , and p^3 , said fingers being in the position shown in Fig. 4, and a loop is formed around the finger p^3 . When the needle is again raised above the work plate the sliding bar P , and its attachments together with the fabric will be carried another step to the left to the position shown in Fig. 5, when the needle descends through

the work plate outside the finger p^2 , and a loop is formed around said finger.

Further operating the machine the needle is next carried down between the two fingers and the thread again forms a loop around the finger p^2 . Next time the needle descends outside of the finger p^2 , next, between the two fingers, next outside the finger p^2 , and in like manner on either side of the same alternately until a sufficient number of loops have been formed around the finger p^2 , to produce the desired length of chain, when the sliding bar P , is carried (by the action of the cam groove o ,) to the right into the position first described and as shown in Figs. 1 and 3, and the needle again passes through the fabric near its edge forming a loop around the finger p^3 . Each time the needle is carried above the work plate the fabric is fed forward one step and carried laterally either to the right or to the left, the feed dog k , the sliding bar P , the guard plate P' , and the fingers p^2 , and p^3 , being also carried correspondingly. As the operation described is continued a chain of loops will be formed around the fingers and connected to the fabric at points more or less distant from each other along the edge of said fabric, according to the form of the irregular groove o , the rate of rotation of the cam cylinder O , and the length of the feed, thus forming a series of open edge chain scallops along the edge of the fabric. The length of the loops of a chain when formed around one of the fingers will be somewhat dependent upon the sizes, the adjustment and the taper of said fingers. The opening in the work plate for the passage of the needle serves as a guide for the thread so that it may not be carried out of reach of the looper.

Any convenient known feeding mechanism may be employed in this machine, or in the absence of fabric without the use of feeding mechanism other than the fingers p^2 , and p^3 , a chain of loops may be formed around said fingers p^2 , and p^3 , or by making the irregular groove o , in such form that the needle will be carried down alternately upon either side of one of such fingers, a chain of loops will be formed around one of said fingers and the other finger may then be dispensed with.

It is not essential to use the form of looper herein shown as any convenient known means for forming loops of thread may be used.

As will be obvious to any one skilled in the art, my invention is not limited and circumscribed by the particular form of mechanical devices herein shown, as they but illustrate one practical application of the principle underlying my invention, as the latter is capable of being practiced by the use and application of various mechanical contrivances operating to effect the movements herein referred to in the manner described for the production of the same or substantially the same results. Thus as will readily be understood, other forms and descriptions of needle operating devices may be employed, the looper

may be replaced by other known forms of loopers and the actuating mechanisms can be varied. So too, the devices for effecting the lateral movements designed to produce the chain of loops by causing them to be drawn or formed over fingers in the manner described, may be varied, and other known equivalent forms of feeding mechanisms may be used in place of that shown.

I regard my invention as generic in that it relates to certain combinations and arrangements of co-operating devices, and except in the particulars hereinafter specified in the claims, the form and arrangement of the members which go to make up the individual devices are unimportant.

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

1. The combination in a machine such as described, of a stitch forming mechanism provided with a vertically reciprocating thread carrier cooperating with a looper to form stitches, and a plurality of stitch-receiving or supporting fingers arranged side by side in the same horizontal plane and movable laterally, between the thread carrier and the looper, in the intervals between the completion of successive stitches, and mechanism operating upon said fingers to shift them side-wise by successive movements in the same direction, to successively present different fingers to the stitch forming devices; substantially as described.

2. The combination with a stitch forming mechanism provided with a thread carrier and a looper cooperating at intervals to connect or interloop portions of the thread of a plurality of fingers over which loops are formed by the stitch forming mechanism, and mechanism actuating said fingers to present each finger separately and at different intervals in

position to receive loops as they are formed by the stitch forming mechanism.

3. In a machine, such as described, the combination of stitch-forming mechanism, a plurality of stitch receiving fingers, and actuating devices for shifting or changing the relative positions of the fingers and stitch-forming mechanism to successively present adjacent fingers in position to receive the stitches; substantially as described.

4. In a machine such as described the combination with a stitch forming mechanism adapted to form stitches around a finger, of devices for feeding forward the fabric and moving it laterally of the direction of feed, and a plurality of fingers provided with actuating devices for reciprocating said fingers laterally and alternately presenting them to the stitch forming devices, whereby one or more stitches may be formed in the fabric and one or more connected stitches may be formed outside of the fabric, substantially as described.

5. In a machine such as described the combination with the stitch forming mechanism including needle looper and work plate, of a laterally movable feed, a finger held normally outside the plane of reciprocation of the needle, and actuating devices controlling said finger to reciprocate it laterally across the plane of reciprocation of the needle, between the latter and the looper, whereby one or more stitches may be formed in the fabric, the latter shifted laterally beyond the needle, and the stitches formed beyond the fabric upon the finger, substantially as described.

JOSEPH M. MERROW.

Witnesses:

FRANK H. ALLEN,
ALONZO M. LUTHER.