(Model.)

R. M. ROSE.

EMBROIDERING ATTACHMENT.

No. 250,582. Patented Dec. 6, 1881.

Fig 1.

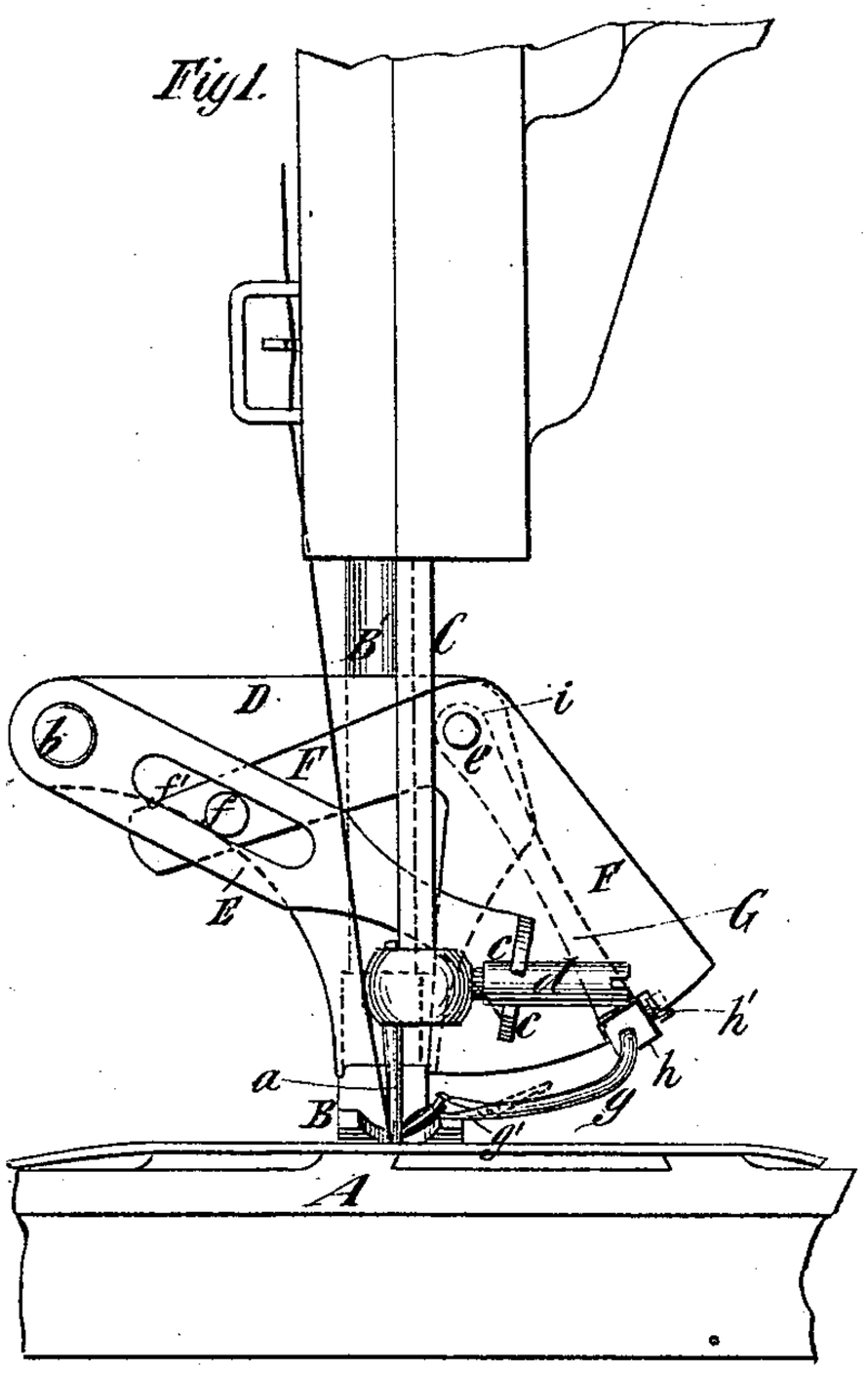


Fig 2.

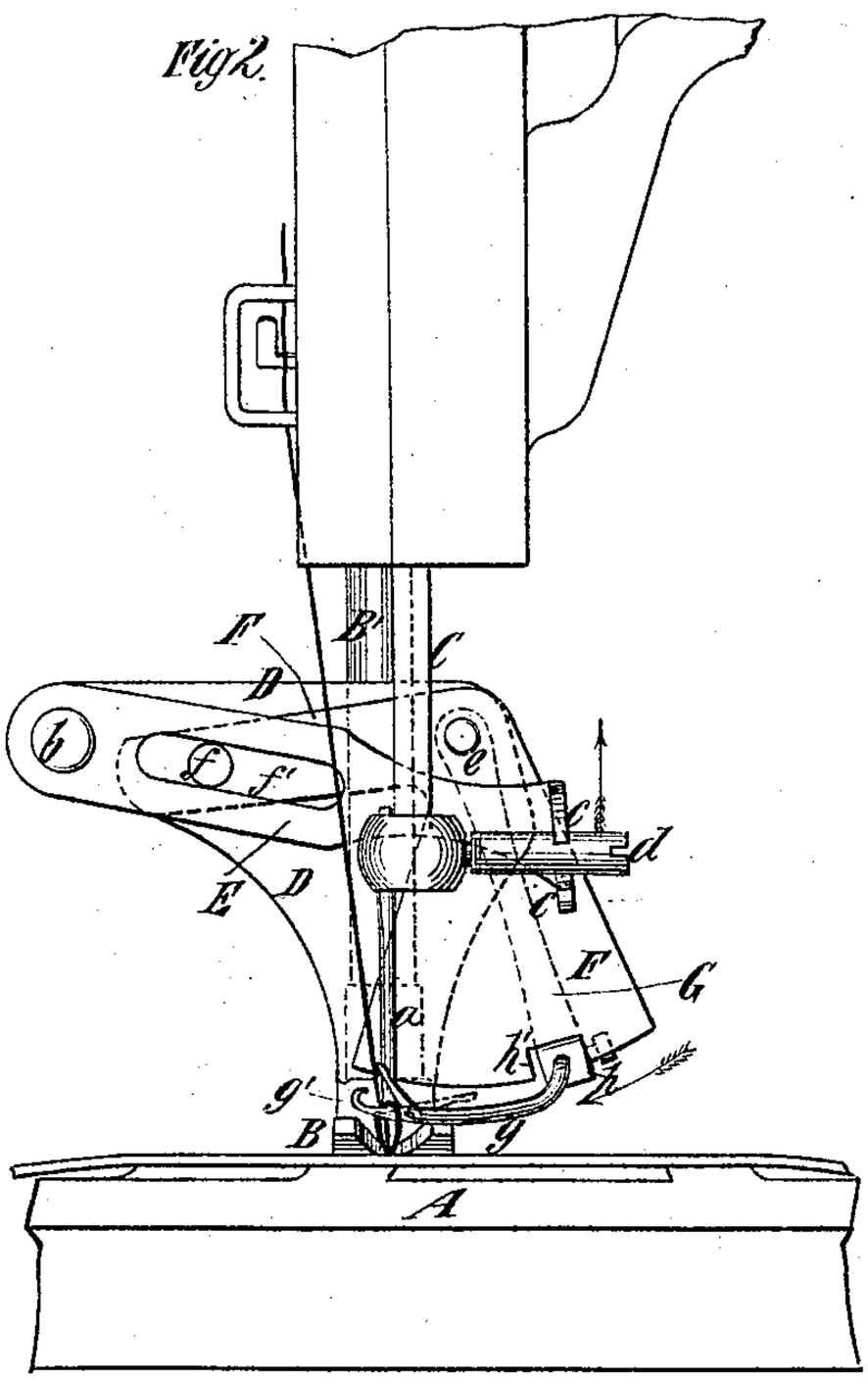


Fig 3.

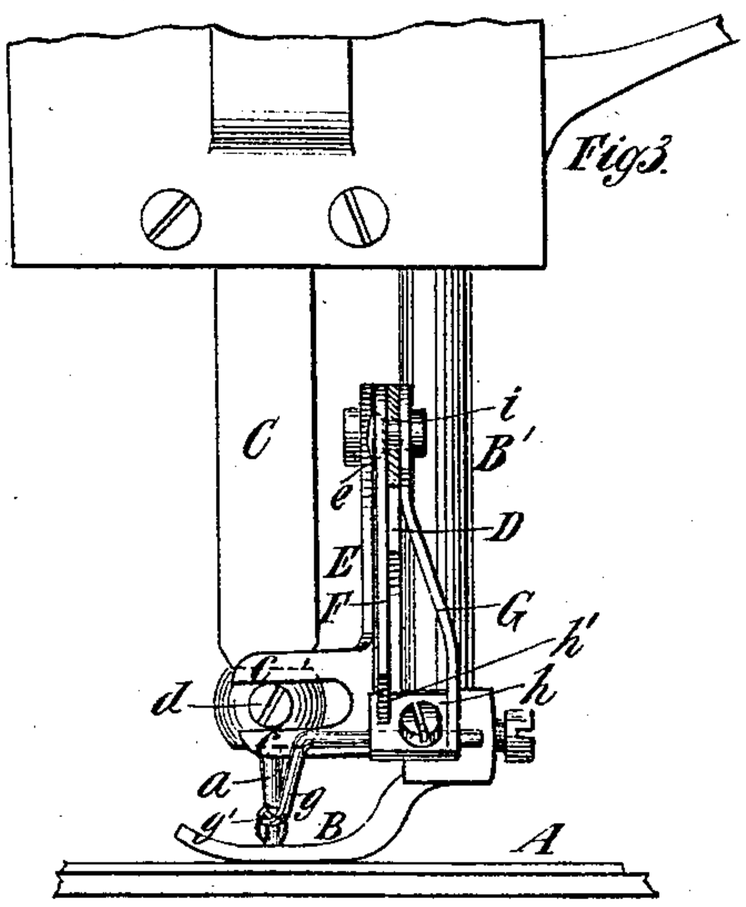
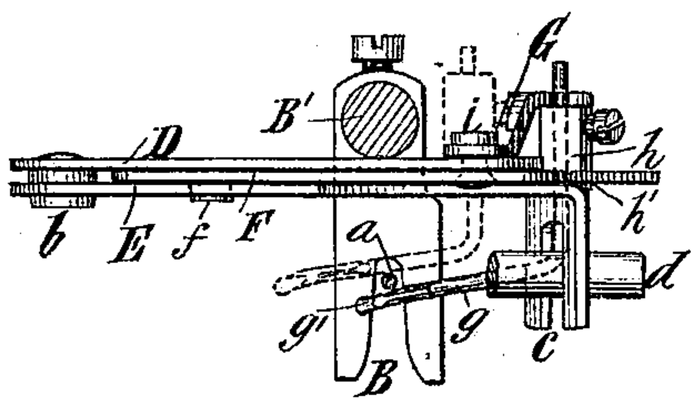


Fig 4.



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EMBROIDERING ATTACHMENT.

SPECIFICATION forming part of Letters Patent No. 250,582, dated December 6, 1881.

Application filed September 8, 1881. (Model.)

To all whom it may concern:

Be it known that I, REUBEN M. ROSE, of Brooklyn, in the county of Kings and State of New York, have invented certain new and Improved Embroidery Attachments for Sewing-Machines, of which the following is a specification.

This embroidery attachment is intended to be applied to either of the two classes of sewing-machines now in most common use—viz., that class in which two threads, worked by a needle and a shuttle or its equivalent, are employed to make the sewing-stitch, and that class in which a single thread, inserted through the cloth or other material on one side, is enchained on the opposite side to form the sewing-stitch.

The invention is an improvement upon the embroidery attachment which forms the subject of my application for Letters Patent filed December 23, 1880, Serial No. 22,770, and which forms the embroidery with the ordinary needle-thread of the sewing-machine, without the use of a special embroidery-thread, by causing the said needle-thread to be enchained in a series of loops, one within another, consecutively, to form a tambour-stitch on the same side of the material on which it enters, which is the opposite side to that on which the sewing-stitch is formed.

In my former application, and also in my present attachment, the embroidery-stitch is formed by a hooked embroidery-needle arranged on that side of the cloth or other material at which the sewing-needle enters, and moved forward and to one side of the sewing-needle as the latter ascends, and backward and to the other side of said sewing-needle as it descends, whereby the sewing-needle before entering the material may place its thread in the form of a loop around the hooked embroidery-needle, and the hooked embroidery-needle may afterward draw said loop through a loop similarly formed by the last previous operation.

In my former application special mechanism is employed for giving the embroidery-needle a lateral movement at the end of each forward-and-backward movement, to carry it from one side to the other of the sewing-needle; and the principal object of my present invention is to dispense with such mechanism. To this end I arrange the embroidery-needle so that its length is oblique relatively to its line of movement forward and backward, so that while its hooked end will pass on one side of the sewing-needle in moving forward the portion behind the hooked end will be caused simply by its longitudinal movement to pass under and to the opposite side of the sewing-needle as the latter ascends; and I also make the embroidery-needle slightly elastic or attach it to a spring-arm, or both, so that its hooked end may be deflected by the sewing-needle when the latter is in the work, to cause it, after leaving the sewing-needle, to spring laterally to bring it on the side of the needle at which it should be in going forward.

In the accompanying drawings, Figures 1 and 2 are side views of my attachment, showing its parts in different positions, and representing, also, the presser-foot, the sewing-needle, and parts of the work-bed, head, and needle-bar of a sewing-machine to which the attachment is applied. Fig. 3 is an end view of said attachment, also showing the presser-foot, sewing-needle, and parts of the work-bed, head, needle-bar, and presser-bar of the machine; and Fig. 4 is a plan of my attachment, including a horizontal section of the sewing-needle and presser-bar, and a plan of the presser-foot.

Similar letters of reference designate corresponding parts in all the figures.

A designates the work-bed; B, the presser-foot; and C, the needle-bar, carrying the ordinary sewing-needle, *a*.

B′ designates the presser-bar, to which the presser B is fixed; and D designates a plate or stock-piece, rigidly secured to the presser-bar B′.

E designates a lever, which is fulcrumed at one end, *b*, to the stock piece or plate D, and is bent outward at the other end and bifurcated or formed with jaws *c*, which receive between them a pin, *d*, projecting horizontally from the needle-bar C, and said lever is moved up and down by the corresponding movements of the needle-bar.

F designates a bell-crank or elbow lever, which is fulcrumed at *e* to the stock piece or plate D, and one arm of which carries a pin,

f, that engages with a slot, *f'*, in the lever E, thereby imparting to the lever F an oscillating motion, and to its downwardly-extending arm a back-and-forward motion. The lever F is arranged between the stock or plate D and the lever E, as clearly seen in Figs. 3 and 4.

The hooked embroidery-needle *g*, which is here represented as an ordinary latch-needle, is rigidly secured in a block or hub, *h*, which is fixed to the end of a spring-arm, G, the opposite end of which is secured to the stock plate or piece D at *i*. The block or hub *h* fits loosely in a notch, *h'*, in the bell-crank or elbow lever F, and thereby insures the movement of the needle backward and forward simultaneously with said lever, while it permits the block or hub and needle *g* to make the necessary slight lateral movement relatively to the stock or plate D. The portion of the needle *g* in rear of its hooked end *g'* is slightly elastic, and stands at a small angle or obliquely relatively to the line of movement thereof, so that while the hooked end *g'* always stands in a position to pass on one side of the sewing-needle *a* the portion in rear thereof is in position to pass upon the other side of said sewing-needle. This will be clearly understood by reference to Fig. 4, wherein the hooked end *g'* of the embroidery-needle *g* is just about passing the sewing-needle *a* on the side opposite the levers E F and stock plate or piece D. While the embroidery-needle *g* is thus moving forward the sewing-needle *a* is ascending, and as it rises clear of the presser-foot B the portion of the embroidery-needle in rear of the hooked end passes under the sewing-needle, and when the said sewing-needle comes down the embroidery-needle *g* is between the sewing-needle *a* and the levers E F. As the embroidery-needle *g* continues its backward movement its hooked end *g'* bears against the side of the sewing-needle *a*, which is then in the work, and thereby deflects the embroidery-needle *g* or the spring-arm G, or both the needle and arm. When the hooked end *g'* of the embroidery-needle *g* passes or leaves the sewing-needle *a* it springs outward into the position shown in Fig. 4, when it is in a position to go forward on the side of the needle *a* opposite to that on which it went backward.

The necessary yielding of the hooked end of the embroidery-needle to enable it to pass by the sewing-needle might be provided for by the elasticity of the embroidery-needle alone, if it were rigidly secured in the lever F, or the said yielding may be provided for by the elasticity of the spring G alone, or by the elasticity of both the said spring and the needle, as in the example illustrated.

In commencing to describe the operation of the embroidery attachment I will suppose that the embroidery-needle is in its most backward position, as represented in Fig. 1 of the drawings, and has not yet been put in operation. The sewing needle is now in its lowest position through the cloth or other material being operated upon. Before starting the operation the latch of the embroidery-needle must be opened, as shown in dotted outline in Fig. 1. The sewing-machine being now set in operation, the sewing-needle rises and the embroidery-needle advances with its latch open, as shown in dotted outline in Fig. 2, and before the sewing-needle has left the cloth the embroidery-needle passes it in front or one side, as shown in Fig. 2 and in bold outline in Fig. 4, and continues to so advance until the sewing-needle has risen entirely above it. During the latter portion of this advance the embroidery-needle passes laterally across the path of the sewing-needle, under the point thereof, arriving in the position shown in dotted outline in Fig. 4. In thus crossing the path of the sewing-needle the embroidery-needle bends aside the thread between the sewing-needle and the cloth. The sewing-needle now descends and enters the cloth, while the embroidery-needle moves back, and the former carries its thread over the open latch of the latter in the form of a loop, which is brought into the hook of the latter by the continued backward movement thereof. As the sewing-needle again rises or retires from the cloth the embroidery-needle again advances and passes across under the point of the sewing-needle, as before described, carrying its open latch forward through the loop already formed, and again bending aside the thread under the sewing-needle to prepare for the formation of a new loop by the next backward movement of the embroidery-needle and descent of the sewing-needle. This backward movement of the embroidery-needle brings the first-mentioned loop under the back of its open latch and causes the said loop to close the latch and pass over the same, and takes the said needle out of the said loop, which then passes over the hook of the said needle, so that as the latter continues to retire it draws the new loop, which its hook has received, through the loop first described, which is then drawn close down to the surface of the cloth by the ordinary operations of tightening the stitch and feeding the cloth in the sewing operation. As the embroidery-needle again advances it passes into the new loop, which then opens the latch to prepare for the formation of a succeeding loop, and after the first stitch has been completed the latch opens during every forward and closes during every backward movement of the embroidery-needle, being always closed, as shown in unbroken outline in Fig. 1, when the needle has completed its backward movement, and commencing to open when the needle, in its advance, approaches the position shown in Fig. 2.

To stop the embroidery at any time without stopping the sewing operation all that is necessary for the operator to do is to close the latch of the embroidery-needle with her finger while the said needle is in its extreme forward position, when the loop on the said needle is behind the point of the latch. This loop will

pass off the embroidery-needle as the latter retires, and the needle will work back and forth with its latch closed without taking any thread. To start the operation again it is only necessary to open the latch of the embroidery-needle while the latter is in any position.

In explaining the operation of my attachment I have not thought it necessary to explain the movement of the shuttle or other devices used in combination with the sewing-needle *a* to make the sewing-stitch, as my attachment in no way changes the ordinary action of such devices relatively to the needle; but it may be applied to and operate in any of the ordinary shuttle or rotating hook sewing-machines.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with the ordinary eye-pointed needle of a sewing-machine, of a hooked embroidery-needle arranged on that side of the material at which the sewing-needle enters obliquely to its line of movement, and adapted to yield laterally, and mechanism for moving said embroidery-needle forward on one side of and under the sewing-needle as the latter ascends, and backward on the other side of the sewing-needle as the latter descends, whereby the sewing-thread is enchained in a series of loops on the side of the material at which the sewing-needle enters, substantially as described.

2. The combination, with the ordinary eye-pointed needle of a sewing-machine, of a hooked embroidery-needle arranged on the side of the material at which the sewing-needle enters, a spring-arm to which said embroidery-needle is attached so that its length is oblique to its line of movement, and mechanism for moving said embroidery-needle forward and on one side of and under the sewing-needle as the latter ascends, and backward on the other side of the sewing-needle as the latter descends, whereby the sewing-thread is enchained in a series of loops on the side of the material at which the sewing-needle enters, substantially as described.

3. The combination of the sewing-needle *a*, the needle-bar C, the base plate or stock D, the levers E and F, the spring-arm G, and the hooked embroidery-needle *g*, carried by said arm, all substantially as described.

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Witnesses:

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