2 Sheets—Sheet 1.

J. H. ROSE & D. M. SOMERS.

Embroidering Attachment for Sewing-Machines.

No. 196,769. **Patented Nov. 6, 1877.**

Fig. 1.

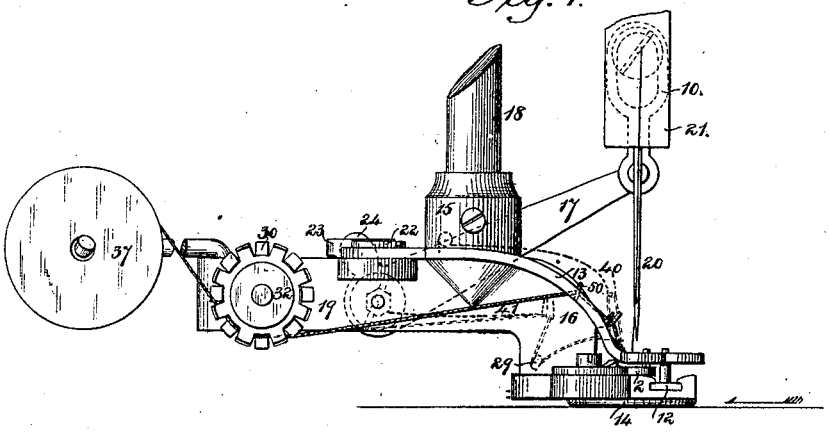


Fig. 2.

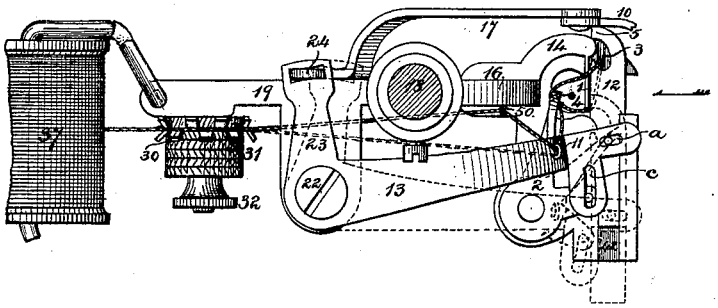


Fig. 3.

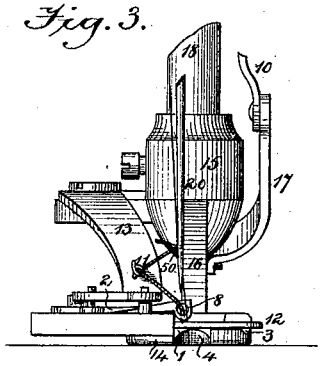


Fig. 4.

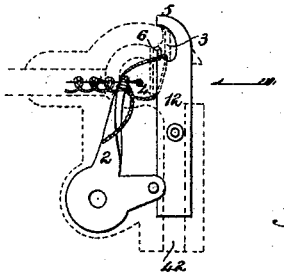


Fig. 5.

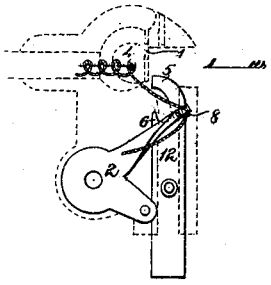
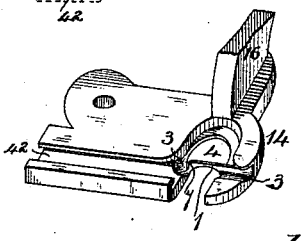


Fig. 6.



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2 Sheets—Sheet 2.

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Fig. 7.

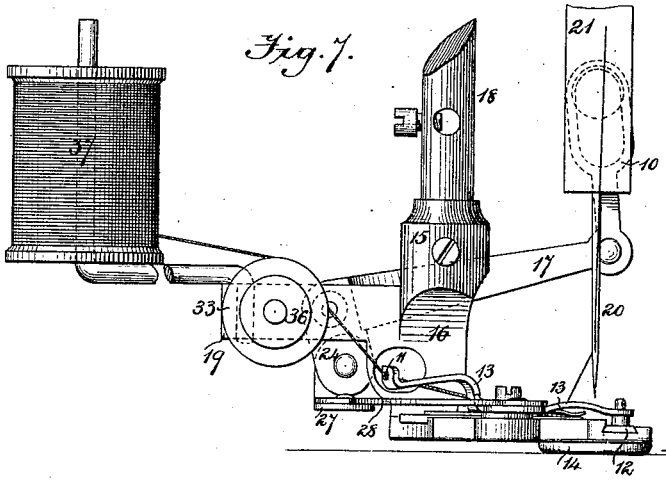


Fig. 13.

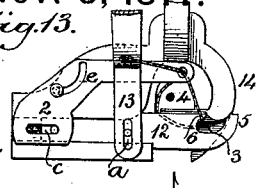


Fig. 14.

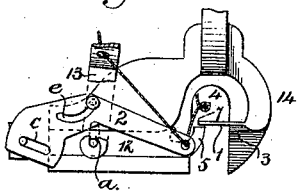


Fig. 8.

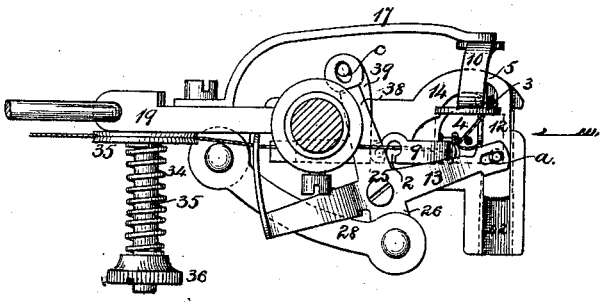


Fig. 10.

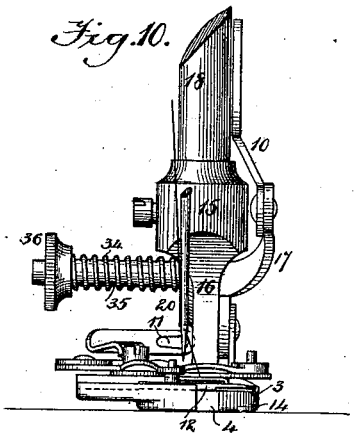


Fig. 9.

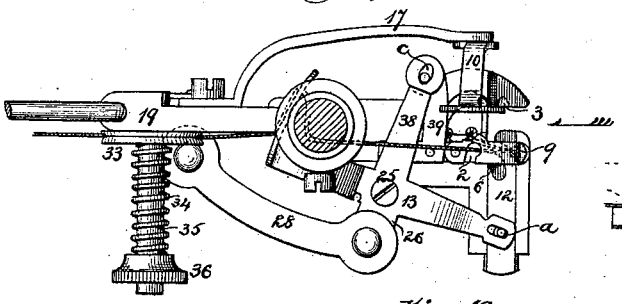


Fig. 11.

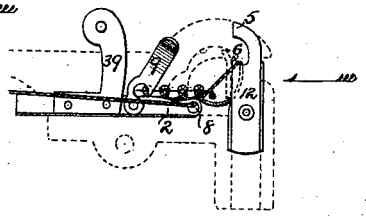
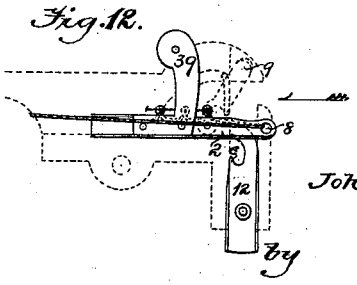


Fig. 12.



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UNITED STATES PATENT OFFICE.

JOHN H. ROSE AND DANIEL M. SOMERS, OF NEW YORK, N. Y.

IMPROVEMENT IN EMBROIDERING ATTACHMENTS FOR SEWING-MACHINES.

Specification forming part of Letters Patent No. **196,769**, dated November 6, 1877; application filed September 18, 1877.

To all whom it may concern:

Be it known that we, JOHN H. ROSE and DANIEL M. SOMERS, of the city, county, and State of New York, have invented an Improvement in Embroidery Attachments for Sewing-Machines, of which the following is a specification:

This invention relates to that class of attachments for sewing-machines which, secured in place of the ordinary presser-foot, manipulates a pattern-thread and lays the same in an ornamental form or figure, which is secured upon the fabric by the sewing mechanism of the machine.

It consists, essentially, of a reciprocating thread-carrier which draws the pattern-thread over a stop in one direction, and of a moving guide which directs the pattern-thread in another direction, the two instrumentalities operating to pay out a quantity of pattern-thread, lay the same behind the sewing-needle, hold it in position until the needle descends before it to form the point of its attachment upon the fabric, and then to draw up the said pattern-thread until it forms an ornamental loop, held fast upon the fabric by the sewed stitch.

It further consists in mechanisms for imparting the motions to the thread-carrier and moving guide, in peculiar take-ups and tensions, and in details of construction, all of which will more fully hereinafter appear.

The illustrations show, in Figure 1, a side elevation of one embodiment of our invention; Fig. 2, a plan view of the same; Fig. 3, a front elevation; Figs. 4 and 5, diagrams illustrating the operation of the instrumentalities for paying out, laying, and drawing the pattern-thread into the form of a loop; Fig. 6, a perspective view of the presser-foot, showing more clearly the stop 7 and thread-channel 3; Figs. 7 to 12, inclusive, a modified form of the invention, Fig. 7 being a side elevation; Figs. 8 and 9, plan views of the parts in two positions; Fig. 10, an end elevation; and Figs. 11 and 12, diagrams similar to those shown in Figs. 4 and 5; and Figs. 13 and 14, plan views of a second modification of our invention.

The instrumentalities forming our improved device are all supported by a metal frame-work, which consists of a shank, 16, a hub, 15, a presser-foot, 14, and an arm, 19. This device is attached to the presser-bar 18 of a sewing-machine by means of the hub 15, and takes the place of the ordinary presser-foot. The presser-foot 14 is perforated by a work-orifice, 4, in which the sewing-needle 20 operates, and through which the work may be inspected as the pattern is being formed. This work-orifice 4 extends through the presser-foot from the front end thereof, and is divided about centrally by a narrow cross-bar, 1, which extends nearly across the same, and whose end is shaped to form a stop, 7, against which the pattern-thread is drawn, as will be explained. The presser-foot is extended sidewise, and has formed in it a rabbeted or grooved way, 42, in which moves the reciprocating thread-carrier 12, which carrier is so fashioned at its forward end as to form a hook, 6, and a stripper-arm, 5, the functions of which will fully hereinafter appear. To this elongated part of the presser-foot the moving thread-guide 2, which has at its extremity a guide-eye, 8, is pivoted to the frame-work, in the construction shown in Figs. 1 to 6, while in the modification shown in Figs. 7 to 12 said presser-foot is channeled out to form a way for the guide 2 to slide in, while in the modification shown in Figs. 13 and 14 the said guide 2 is pivoted both to the presser-foot and to the carrier 12.

The thread-carrier 12 and the thread-guide 2 are, in all of the forms of the invention, actuated by a vibrating lever, 13, pivoted to the frame-work, and driven by a lever, 17, which is vibrated by the movements of the needle-bar 21, to which it is connected by a link, 10, whose elongated slot embraces the needle-screw, and thus provides a lost motion, which will be hereinafter referred to.

In the construction illustrated in Figs. 1 to 6, the lever 13 is shown as pivoted at 22, and its arm 23 has a slotted opening, into which the arm 24 of the lever 17 enters, whereby the vertical reciprocations of the latter lever transmit horizontal vibrations to the former.

In the construction shown in Figs. 7 to 12, the lever 13 is shown as pivoted at 25, and its arm 26 is connected by links 27 and 28 to the arm 24 of the lever 17, whereby the vertical reciprocations of the latter transmit horizon-

tal vibrations to the former. Either of these modifications of the levers may be applied to the device shown in Figs. 13 and 14.

In all of the forms of the device the end of the lever 13 is slotted at *a*, in its forward end, to receive a pin projecting from the thread-carrier 12, thus causing the latter to reciprocate.

The vibrating lever 13, in the construction as illustrated in Figs. 1 to 6, is provided with a second slot, *c*, which receives a pin projecting from an arm of the thread-guide 2, thus causing it to be vibrated in a horizontal plane. As shown in Figs. 7 to 12, however, the modified form of this thread-guide 2 is such as to require a horizontal reciprocating movement, and this is accomplished by means of an arm, 38, slotted at its end to receive a pin projecting from an arm, 39, attached to the said thread-guide 2, which slides in a channel-way, as before described.

In the modification shown in Figs. 13 and 14, the carrier 12 operates as in the other forms of the device; but the thread-guard 2 has a right-angular movement imparted to it, as follows: It is pivoted to the presser-foot, in the construction as illustrated in Figs. 1 to 6, but has near its center a curved slot, *e*, by which it slides upon said pivot, and it is attached at its rear end to the extremity of the thread-carrier by a pivot which slides in a slot, *c*, which construction causes its end which has the eye 8, in passing from the position shown in Fig. 14 to that of Fig. 13, to first move rearward, or toward the shank 16, and then forward, or in the same direction as the thread-carrier, thus carrying the pattern-thread a considerable distance behind the needle, and insuring its passing before said thread.

The arm 19 of the frame-work supports a spool-holder and a tension device. The spool-holder consists simply of a wire fastened in a hole drilled in the frame-work, and bent at a right angle to receive a spool of thread. The tension device shown on Sheet 1 consists of a metal disk, 30, with alternating spurs, which disk is controlled by a screw, 32, and suitable washers, and, as shown in Sheet 2, of a pair of metal disks or plates, 33, between which the thread passes, which plates are held in frictional contact by means of a spring, 34, encircling the spindle 35, and abutting against a screw-nut, 36, the pressure of which spring 34 may be regulated by said screw-nut 36. Neither of these tension devices is, however, novel in itself, and therefore may have substituted for it any other form of device for producing tension upon the pattern-thread.

The pattern-thread passing from a spool, 37, mounted upon the holder, after being passed around the tension-wheel 30 or between the tension-disks 33, or other suitable tension device, is passed over a hook, 50, on the frame 16, then is threaded through a guide eye or hook, 11, in the lever 13, thence through the guide-eye 8 in the thread-guide 2; but it may pass direct from the spool to the eye or hook 11, though the first-described threading is desirable.

In order to a full understanding of the operation of this embroidering attachment, we must suppose the sewing-needle to have made a stitch in the fabric and to be raised to its highest position. The fabric being fed, the sewing-thread will be stretched through the needle-eye and down to the fabric in an angular position, as in Figs. 1 and 7. The pattern-thread is then passed from the guide-eye 8 in the thread-guide 2, so as to lie before the stretched sewing-thread, and at a point behind the plane in which the sewing-needle reciprocates. The descent of the needle will then operate to form a stitch and fasten the end of said pattern-thread down onto the fabric, which pattern-thread will thus be drawn between the hook 6 and stripping-arm 5 of the carrier 12 and lie against the stop 7. As the needle rises it vibrates the levers 17 13, the latter reciprocating the carrier 12 and causing it to traverse from the position shown in Figs. 5, 12, and 14 to that shown in Figs. 4, 11, and 13. In this movement of it the hook 6 of the carrier 12 engages the pattern-thread, and draws the same over or partially around the stop 7, the under side of the grooved way 42 being cut out, as at 3, to form a channel for the said thread to lie in, beneath the under surface of the carrier 12 and the top of the presser-foot 14. The reciprocation of the carrier 12 begins and proceeds with the movements of the lever 13, while the slot *c*, in which the driving-pin of the thread-guide 2 enters, permits said carrier to play a distance before motion is communicated to the said thread-guide, this arrangement permitting the hook of the carrier 12 to engage the pattern-thread and carry it beyond the stop 7 and behind the stop-bar 1, thus securing it before the guide 2 begins to affect it. When this is accomplished the motion of the thread-guide 2 begins, and its rearward reciprocation draws the pattern-thread in that direction while the carrier 12 advances it, these combined movements distending the pattern-thread from its point of attachment to the fabric around the end of stop 7, behind and nearly parallel with the stop-bar 1, and over the hook 6, as in Figs. 2, 4, 8, 11, and 13.

During this movement of the parts the thread has been payed out from the spool to the extent required. The needle-bar 21 has now reached its highest position, and the feed-movement is imparted to the fabric in the direction of the arrows, and carries that portion of the pattern-thread which is stretched from the hook 6 over the work-orifice 4 to the eye 8 in the thread-guide 2 into a plane behind that in which the needle descends.

In order that this position of the pattern-thread shall be maintained until the needle has passed down before it, the link 10, connecting the driving-lever 17 to the needle-bar, is

formed with an elongated slot where it embraces the needle-screw. This slot provides a lost motion—that is, the needle may descend to pass before the pattern-thread and enter the fabric, thus carrying the sewing-thread over the pattern-thread before the lever 17 begins to move to actuate the instrumentalities which manipulate said pattern-thread.

The needle continues to make its downward stroke to draw the sewing-stitch tight as the thread-carrier 12 and thread-guide 2 make their reverse reciprocations. The carrier 12 now operates, by means of its stripping-arm 5, to cast the pattern-thread off from the stop-bar 1, and the guide 2 draws said thread over before the said carrier, so that the thread may be in position to be again engaged by said carrier. The superabundant length of pattern-thread which is required by the throw of the carrier 12 and guide 2, which bind it around the needle, is, during the rearward reciprocations of said parts, withdrawn by the movement of the lever 13, through whose eye or hook 11 said thread passes, the said lever 13 thus acting as a take-up, which draws the thread from the position shown in Figs. 4, 11, and 13 to that shown in Figs. 5, 12, and 14, where it lies tightly drawn around the needle, thus forming said thread into an ornamental loop, held fast by the sewing-thread. The needle then rises, the instrumentalities which control the pattern-thread again reciprocate in the forward direction, the fabric is fed to determine the length of sewing-stitch, and, consequently, of the pattern-loops, and the operation is repeated.

In case of any irregularity in the pattern-thread, as where worsted and the like is used, an auxiliary take-up may be required to produce a perfect regularity in the work. This take-up may be provided with a spring, as 40, attached to the lever 13, so as to overlie its guide eye or hook 11, and have the pattern-thread passed through its bent end, as in Fig. 1; or a similar spring, as 41, attached to the frame-work, so that its hooked end shall stand between the spool 37 and the eye 8 of the guide 2 may have the pattern-thread passed through its bent end, thence under a fixed hook, 29, to the guide eye or hook 11 and 8. Either of these springs will be drawn out of their normal position by the pattern-thread as it is moved forward by the carrier 12 and guide 2, and will, of course, retract and take up the slackened threads when the parts move into the positions shown in Figs. 2 (dotted lines) and 5, thus drawing the thread so as to form a perfect pattern.

In the modified construction shown in Figs. 7 to 14, inclusive, the parts corresponding with similar parts in the construction shown in Figs. 1 to 6, inclusive, are marked with like characters. There is no material change in the structure of the modifications of the device, except in the mode of actuating the thread-guide 2, the same function and principle of operation being common to all of the parts in each structure. Though the thread-guide 2 is vibrated in two examples of the device, and has a right-line reciprocation in another, its guide-eye 8 moves to and from the same points, and manipulates the pattern-thread in substantially the same manner; and though the guide-eye in the lever 13 is at the front end thereof, in one instance, and in the rear end in another, its function as a guide and take-up are performed in precisely the same manner by both constructions.

In one modification a twist-controller, 9, is supplied to the guide 2, it being a plate pivoted thereto at its rear end, raised in its center, where it is pierced with a hole to permit the passage of the thread, and bent down at its forward end to bear over the guide-eye 8 with a spring-pressure. Its function is to prevent the twist which is imparted to the pattern-thread by the manipulation of it by the carrier and guide, and force the same to remain in that part of the pattern-thread which is beyond the guide-eye 8 or sewed to the fabric. This twist-controller may, of course, be applied to any form of the guide 2, and will prevent any accumulation of twist in the pattern-thread between the guide 2 and the supply-spool which would prevent the perfect operation of the device.

What is claimed is—

1. A reciprocating thread-carrier, 12, provided with a hook or fork, 3, and a stripper, 5, substantially as described.

2. A thread-guide, 2, having an eye, 8, substantially as described.

3. The combination, substantially as described, of a stop, 7, a moving thread-guide, 2, and a reciprocating thread-carrier, 12, with mechanism for operating the same.

4. The combination of the actuating-lever 13, and means for connecting the same to the operative parts of a sewing-machine, with the thread-carrier 12 and thread-guide 2, substantially as described.

5. The combination of the levers 17 and 13 with the carrier 12 and guide 2, substantially as described.

6. The presser-foot provided with the channel 3 and stop 7, in combination with the thread-carrier 12 and operating mechanism, substantially as described.

7. In combination with the presser-foot provided with stop-bar 1, the thread-carrier 12, having stripper 5, substantially as described.

8. The twist-controller 9, in combination with the thread-guide 2, substantially as described.

9. The combination of guide 11, hook 29, tension-spring 41, and tension device, substantially as described.

10. The combination of the driving-lever carrying a link, 10, having an elongated slot, with the lever 13 and reciprocating thread-carrier 12, substantially as described.

11. In combination with the tension de-

vice, thread-carrier 12, and thread-guide 2, the lever 13, having a guide-eye, 11, substantially as described.

12. The combination of the hook 50 with lever 13, provided with guide hook or eye 11, and the thread-guide 2, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

JOHN H. ROSE.
DANIEL M. SOMERS.

Witnesses:
H. T. MUNSON,
J. C. KLUBER.