

(No Model.)

W. D. RUNDLETT.
SEWING MACHINE.

No. 570,960.

Patented Nov. 10, 1896.

Fig. 1

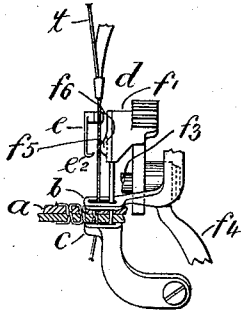


Fig. 2

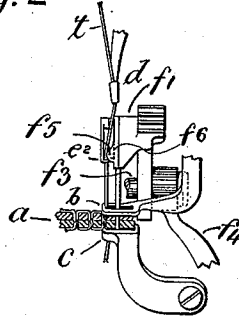


Fig. 3

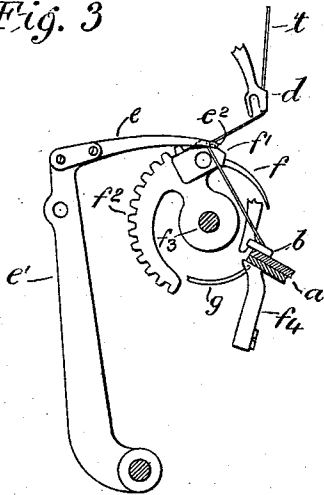
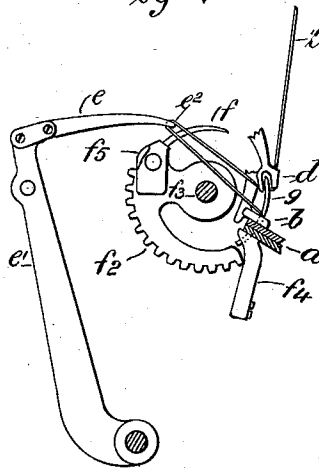


Fig. 4



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SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 570,960, dated November 10, 1896.

Application filed May 6, 1893. Serial No. 473,210. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM D. RUNDLETT, formerly of the city and county of Providence, in the State of Rhode Island, but now residing at North Andover, Massachusetts, have invented certain new and useful Improvements in Sewing-Machines; and I do hereby declare the following specification, taken in connection with the accompanying drawings, forming a part of the same, to be a full, clear, and exact description thereof.

The present invention relates more particularly to the matter of forming a loop upon one side of the work to be engaged and pulled through the work by a hook-needle, as is customary in hook-needle machines. For the formation of this loop there are commonly employed two devices known as a "thread-arm" and a "thread-eye," one or both of which serve to draw out the loop. The thread-eye is always in engagement with the thread, the thread passing through an inclosed eye therein. The thread-arm, however, is not always in engagement with the thread, but engages and releases the thread alternately at each successive stitch. The thread-arm, therefore, cannot be provided with an inclosed eye, but must, instead, be provided with some sort of engaging device which will readily release the thread at the required times.

Usually the thread-arm is provided with a sort of hook or bent end for engaging the thread, and means are employed for periodically moving the thread into engagement with, or into a position where it can be engaged by, the hook of said thread-arm, this being commonly done by a suitable movement of the thread-eye.

One feature of the present invention consists in so arranging the thread-arm with relation to the standing thread, that is, the thread extending from the work to the thread-eye, and with relation to the feed of the work that the feeding movement of the work will serve to move the standing thread toward the thread-arm and into line with the hook thereof, and so that with the parts properly arranged and timed the thread may be moved into a position where it will be engaged by the hook of the thread-arm simply by the feeding movement of the work and without the

employment of any other means for the purpose. As the thread-arm is provided with merely a hook or bent end for engaging the thread, there is a liability, particularly in stitching around the toe of a narrow or pointed-toe shoe, that the thread may be pulled or twisted out of the hook of the thread-arm prematurely. To overcome this difficulty, a further feature of invention consists in so arranging the awl-head with relation to the standing thread and the thread-arm that when the awl-head has been moved to feed the work it will serve to hold the thread in the hook of the thread-arm.

A still further feature of invention consists in so constructing or arranging the parts that the movement of the awl-head in feeding the work will serve as an auxiliary or supplemental means for moving the standing thread toward the thread-arm and into line with the hook thereof.

Referring to the drawings, Figure 1 represents a front view of such parts of a sewing-machine as are necessary for the understanding of the present invention. Fig. 2 is a like view showing certain of the parts in a different position. Fig. 3 is a view taken at right angles to Fig. 2 and showing certain of the parts in a still different position; and Fig. 4 is a like view to Fig. 3, but showing the parts in a different position.

In the drawings, *a* represents the work, which is held between the presser-foot *b* and the work-support *c*.

d represents the thread-eye through which the upper thread *t* passes on its way from the work to the take-up, and *e* represents the thread-arm, which is secured to an operating-lever *e'* and is provided at its free end with a hook *e''* for engaging the thread.

f is the awl, which is mounted in the awl-head *f'*, which said awl-head is adapted to be oscillated by the segment-gear *f''* and suitable connecting mechanism. This awl-head is also capable of sliding lengthwise upon its supporting-shaft *f'''* for the purpose of giving to the awl the proper movement to feed the work, this sliding movement of the awl-head *f'* being effected by means of the arm *f''''*, connected therewith, which said arm is adapted to be operated at the proper times by suit-

able connecting mechanism. The awl-head f' is provided with a boss or projection f^5 for the purpose hereinafter described.

g is the hook-needle, which is to be mounted in a suitable head and operated by suitable mechanism in the usual manner.

The loop-forming devices and the needle and awl mechanism shown in the drawings are the same as those shown and described in an application for Letters Patent filed by me June 24, 1892, Serial No. 437,876, in which said application the operation of said parts is fully described. It will not be necessary for an understanding of the present invention to repeat in detail the description of the operation of said parts or the mechanism for operating them. It will be sufficient in this connection to simply state the movements which are given to the different parts. The thread-eye d has a vertical movement given to it, whereby it is moved at the proper time from the position shown in Figs. 1, 2, and 3 to the position shown in Fig. 4, and said thread-eye also has a slight oscillating movement given to it for the purpose of laying the thread into the barb of the needle, as usual in machines of this class. The thread-arm e has a swinging or oscillating movement given to it by suitable connecting mechanism, whereby it is swung forward into a position to engage the thread t , as indicated in Figs. 1 and 2, and is then swung backward to draw out the loop of thread and into the position shown in Fig. 4. The awl-head and awl are first oscillated or swung from the position shown in Fig. 4 to the position shown in Fig. 1, so as to cause the awl to puncture the work and make a hole for the passage of the needle. The awl-head and awl are then moved laterally, the awl-head being slid lengthwise upon its supporting-shaft for the purpose of feeding the work the required distance for a stitch. The awl-head and awl are then at the proper time oscillated to withdraw the awl from the work and swung back to their original position, as shown in Fig. 4.

It will be understood that after the awl has entered the work the presser-foot b is lifted to permit the feeding of the work by the movement of the awl-head and awl and is then lowered to clamp the work before the awl is withdrawn. Ordinarily the withdrawal of the awl and the backward movement of the thread-arm to draw out the loop of thread take place simultaneously.

As will be seen by reference to the drawings, the thread-arm is arranged to move in a plane substantially at right angles to the line of movement of the work as it is being fed and on that side of the standing thread toward which the work is moved in feeding, and the parts are so arranged and timed that when the feeding movement is ready to take place the thread-arm e is in its forward position and with the hook e^2 just in front and to one side of the standing thread, and the thread-eye b is at its greatest distance from

the work. When now the awl-head and awl are moved lengthwise of the shaft f^3 , as from the position shown in Fig. 1 to the position shown in Fig. 2, for the purpose of feeding the work, the lower end of the standing thread will be carried along with the work and the standing thread be thereby moved toward the thread-arm and into a position where it will be engaged by the hook of the thread-arm when the latter is moved backward to draw out the loop. The arrangement of the parts is such that when the awl is in the work and the feeding movement is taking place the awl-head f' will be in line with the standing thread, and so that when the awl-head is moved lengthwise on the shaft f^3 to feed the work said awl-head or the boss f^5 thereon will be brought into a position where it will serve to hold the thread in the hook of the thread-arm, as shown in Fig. 2, and prevent said thread from being pulled or twisted out of the hook of the thread-arm as long as the parts remain in substantially the same relative position. If desired, the awl-head may, in addition to thus holding the thread in the hook of the thread-arm, be made to serve as an auxiliary means for moving the standing thread toward the thread-arm and into line with the hook thereof. Thus by properly arranging the parts or by making the boss of proper length the awl-head or the boss thereon will come in contact with the standing thread during the feeding movement of the awl-head, and so that the continued feeding movement of the awl-head will cause the thread to be thereby pushed toward the thread-arm and into line with the hook thereof. When this arrangement is employed, the feeding movement of the awl-head effects the proper movement of the standing thread in a twofold manner, to wit, first, by imparting a corresponding feeding movement to the work, to which one end of the standing thread is connected, and, second, by coming directly in contact with the standing thread itself. Thus the movement of the standing thread into line with the hook of the thread-arm and its engagement thereby are doubly insured. The parts may be so arranged and timed that the boss f^5 will, in moving the thread into the path of the hook of the thread-arm, pass in behind said hook, or, if desired, a slot f^6 may be cut in the face of the boss f^5 to receive the extreme end of the hook e^2 of the thread-arm, as indicated in dotted lines, Fig. 2.

As the withdrawal of the awl from the work takes place simultaneously with the backward movement of the thread-arm to draw out the loop, the boss f^5 will retain substantially the same relative position to the hook of the thread-arm and so as to hold the thread in said hook for a considerable distance during the simultaneous movement of the parts and until the parts have reached the position shown in Fig. 3, in which position and during the remainder of the movement of the

thread-arm the thread will be securely held by the hook of the thread-arm alone until such time in the forward movement of the thread-arm as it is desired that the loop should be released by the thread-arm.

It will be understood that at the proper time the awl-head and awl are moved back lengthwise of the shaft f^3 to their original position, and that thus the awl-head will be moved sufficiently far away from the thread-arm so as not to in any way interfere with the proper release of the thread from the hook of the thread-arm at the proper time in the forward movement of said thread-arm.

It will thus be seen that by the arrangement and organization of parts above described the thread may be moved into line with the hook of the thread-arm simply by the feeding movement of the work; that when thus moved into line with the hook of the thread-arm, either by the feeding movement of the work or by any other means, the thread will be held securely in said hook by the awl-head during all that period in which there is any liability of the thread being pulled or twisted out of said hook, and, finally, that the awl-head may, by being arranged to come in contact with the standing thread during the feeding movement of said awl-head, serve to move the thread into line with the hook of the thread-arm directly as well as indirectly through the feed of the work.

If desired, the boss f^5 may be omitted and the slot f^6 to receive the end of the hook e^2 of the thread-arm be cut directly in the face of the awl-head, in which case the thread will be moved and held by said face of the awl-head in precisely the same manner.

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

1. The combination with means for feeding the work, of a thread-eye, and a thread-arm having the hook so arranged with relation to said thread-eye that the feeding movement of the work will carry the thread toward said thread-arm and into line with the hook thereon, substantially as described.

2. The combination with means for feeding the work, of a thread-eye, a thread-arm having its hook so arranged with relation to the thread-eye that the feeding movement of the work will carry the thread toward said thread-arm and into the paths of the hook thereon, and means for actuating said thread-arm, substantially as described.

3. The combination of a thread-eye, a thread-arm, means for moving the standing thread into line with the hook of said thread-arm, an awl-head and awl, and means for moving said awl-head and awl to feed the work, said awl-head being in such relation to the thread-arm that when said awl-head has been moved to feed the work, it will serve to hold the thread in the hook of the thread-arm, substantially as described.

4. The combination of means for feeding the work, a thread-eye, a thread-arm so arranged with relation to said thread-eye that the feeding movement of the work will carry the thread toward said thread-arm and into the path of the hook thereon, and means for holding the thread in said hook, substantially as described.

5. The combination of a thread-eye, a thread-arm, an awl-head and awl, means for moving said awl-head and awl to feed the work and for moving said awl-head into close proximity to the hook on said thread-arm, whereby said awl-head serves to hold the thread in said hook, substantially as described.

6. The combination of a thread-eye, a thread-arm, an awl-head and awl, and means for moving said awl-head and awl to feed the work, said awl-head being in such relation to the thread-arm that when said awl-head is moved to feed the work it will serve to directly move the thread into line with the hook of said thread-arm, substantially as described.

7. The combination of a thread-eye, a thread-arm, an awl-head and awl, means for moving said thread-arm to draw out a loop of thread, means for oscillating said awl-head and awl, and means for moving said awl-head and awl to feed the work, said awl-head being in such relation to the thread-arm that when said awl-head has been moved to feed the work it will serve to hold the thread in the hook of the thread-arm, and the said means for oscillating the awl-head operating simultaneously with the means for moving the thread-arm, whereby said awl-head will continue to hold the thread in the hook of the thread-arm during a portion of the oscillation of said awl-head, substantially as described.

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