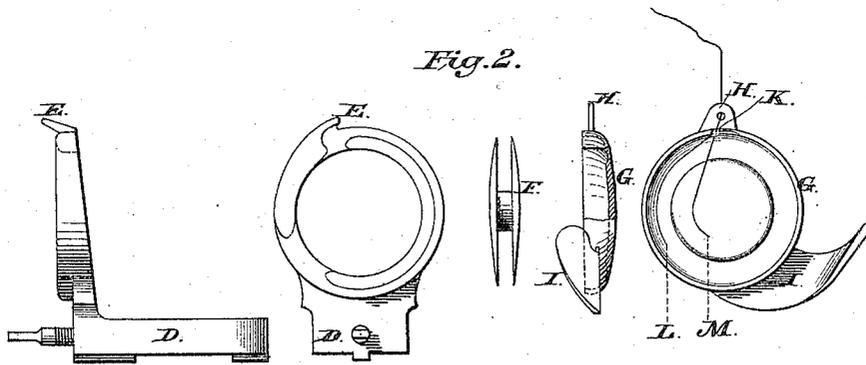
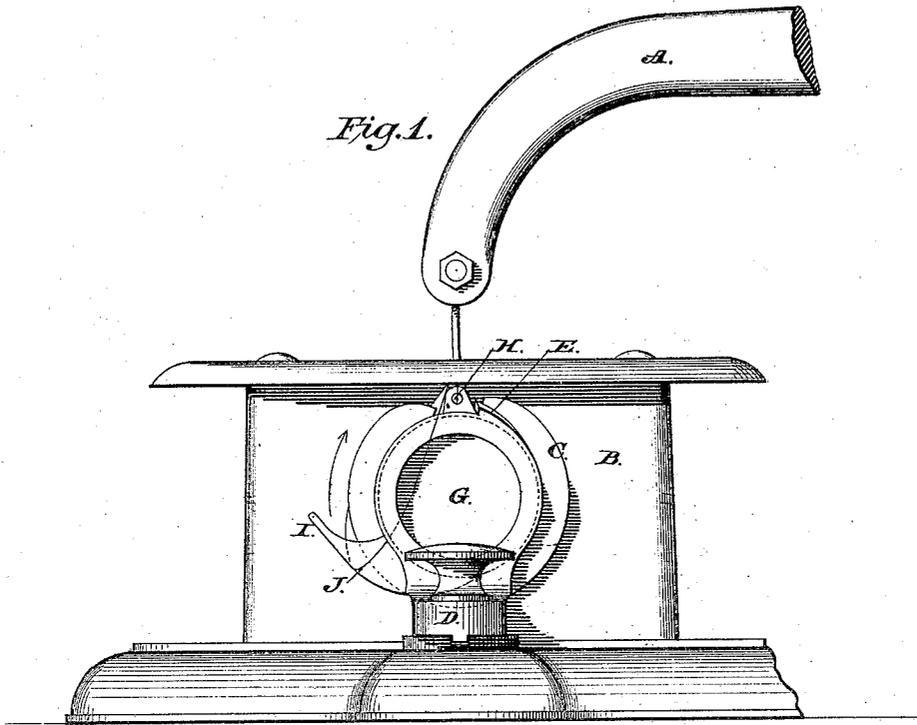


A. C. VAN SANT.

REVOLVING-HOOK SEWING-MACHINE.

No. 172,676.

Patented Jan. 25, 1876.



Attest
Nicholas Ulrich
John H. Waeple

Inventor
Adam C. Van Sant

UNITED STATES PATENT OFFICE.

ADAM C. VAN SANT, OF PEORIA, ILLINOIS, ASSIGNOR TO WHEELER AND WILSON MANUFACTURING COMPANY, OF BRIDGEPORT, CONNECTICUT.

IMPROVEMENT IN REVOLVING-HOOK SEWING-MACHINES.

Specification forming part of Letters Patent No. **172,676**, dated January 25, 1876; application filed August 13, 1875.

To all whom it may concern :

Be it known that I, ADAM C. VAN SANT, of the city and county of Peoria, in the State of Illinois, have invented certain Improvements in Sewing-Machines, which improvements are fully set forth in the following specification, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention consists in certain improvements in the well-known Wheeler and Wilson machine; and pertains particularly to the parts thereof which perform the interlocking of the threads in forming the stitch.

In Figure 2 of the accompanying drawings the parts of my invention are shown separately, while in Fig. 1 of the same they are shown applied to the machine as when in operation, the parts of each being lettered as follows:

A, arm of machine; B, frame of machine; C, rotating hook; D, ring-slide; E, stop; F, metal spool or bobbin; G, bobbin-case; H, leader; I, loop-controller; J, loop of upper thread; K, tension-regulating notch, while L and M show different positions of the under thread.

The construction and operation of my invention are as follows:

The metal spool or bobbin for containing the under thread (shown at F, Fig. 2) is constructed essentially as heretofore, except that it is much thicker. The bobbin-case G is constructed in the shape plainly shown in the drawings, and is of sufficient depth that when placed over the bobbin, as in operation, its edges may completely cover the opening in the circumference of the bobbin. From the top of the bobbin-case extends a short projection, as shown at H, which I term a leader, and from the bottom of the same extends a longer projection, which is shaped as shown at I, which I term a loop-controller, and in the edge of its rim, near the leader H, is formed a passage for the thread, which I term a tension-regulating notch. (Shown at K.) The center of the recess in the bobbin-case is raised slightly above the general surface, as represented more particularly by the sectional view in Fig. 2. The ring-slide D I construct the same as heretofore used, except that upon the top of the same I place a projection or spur, as shown at E, which I term a stop.

As the parts of my invention are plainly shown in the drawings, the foregoing brief description, together with the further reference to them in explaining their operation, will be sufficient to render their construction clearly understood.

To prepare the machine for work, the bobbin F, after being filled with thread, is placed within the bobbin-case G, the thread passing from the bobbin through the tension-regulating notch K and the eyelet-hole in the leader H, and both are placed within the recess in the face of the rotating hook, and held there by means of the ring-slide D, the stop E being just in front of the leader H, which prevents the case from turning with the hook, and holds the loop-controller I always in one position, as seen in Fig. 1.

When in operation, the rotating hook revolves in the direction indicated by the arrow, (the thread in the bobbin being wound in an opposite direction,) while the fabric being sewed, if passing through a machine standing as shown in the drawings, would be fed toward the observer.

While the interlocking mechanism used in the Wheeler and Wilson machine is now well understood, yet it will be necessary to refer to its operation, both with and without my improvement, in order that the application of my improvement thereto may be clearly comprehended. Its operation is as follows:

As the needle is forced through the fabric, it passes in close proximity to the rotating hook, which is shown at C, and as it starts to rise, thus forming a loop of the upper thread, the loop is caught upon the point of the rotating hook and there held until the hook has performed a part of a revolution, when that portion of the loop which was back of the point of the hook enters a diagonal groove, which conducts it toward the face of the hook, where it is chamfered off in such form as to cast the loop off the face of the hook and over the metal spool or bobbin (which has formerly been used without a case) which contains the under thread, thus interlocking the two threads.

It will be seen that even after the loop has been thus passed around the bobbin, the stitch is still incomplete, the hook being incapable of completely disengaging itself from

the loop, preparatory to making the next stitch. This is accomplished in my invention by means of the loop-controller I, the operation of which is as follows:

As the loop of the thread is being carried by the hook around the bobbin-case which incloses the bobbin containing the under thread, before the operation is entirely complete, the loop comes in contact with the loop-controller, which gradually arrests its passage, and, as the loop must pass over the loop-controller also to complete its passage around the under thread, it is evident that in doing so the loop will be elongated; and the controller is constructed of such width and shape that the strain upon the thread caused by its passage over the controller will be just sufficient to draw the loop from behind the point of the hook. After performing this office, the loop is retained upon the loop-controller, as shown by the line J in the drawings; until the hook enters the succeeding loop, when, as the hook draws thread for the next stitch, it slides off the end of the controller and is drawn up into the fabric, thus completing the stitch.

It will be seen that part of the slack thread which forms this loop is drawn up by the needle as it penetrates the fabric for the next stitch, and it is evident that more of the loop will be thus taken up in sewing upon thick than upon thin fabrics. To permit this, the loop-controller is so shaped that as the loop approaches its upper end the loop will be slackened sufficiently to give the necessary amount of thread. In sewing thick fabrics, therefore, the loop merely slides enough nearer the upper end of the controller to give this necessary amount of thread, and is there retained, preparatory to being drawn up during the formation of the next stitch.

I do not, however, confine myself to the use of the loop-controller I, as the leader H and the tension-regulating notch K perform important functions in and of themselves, whether used in connection with the loop-controller I or any other device which will accomplish the same purpose. As, for instance, the end of the under thread being passed through the leader H, as described, even if extending only far enough to reach the fabric being sewed, will be always held by the leader H in exactly the proper position to be caught by the loop of the upper thread, and requires no further attention from the operator whatever, while, as now in use, a sufficient length of thread must be left extending from the bobbin to be either made fast or held by the operator, thereby incurring a waste of thread, and requiring the careful attention of the operator at the beginning of every seam.

Again, with the bobbin as heretofore employed, if the machine is turned backward, which frequently occurs with beginners, on reversing the motion the under thread will usually be caught behind the rotating hook,

and the sewing can only be continued by removing the work and rearranging the threads, while with my improvement, the under thread being held by the leader H entirely away from the point of the rotating hook, it can, under no circumstances, be caught by it, and the machine may be turned backward repeatedly, and then when reversed will continue to sew with as much certainty as if turned only in the proper direction.

Again, a difficulty has formerly existed on account of the constantly-increasing tension of the under thread as it becomes exhausted from the bobbin, owing to the fact that the thread is more easily drawn from the circumference of the bobbin, as when full, than from nearer its center, as when nearly empty, and consequently requiring a frequent change of the tension of the upper thread to insure a uniform interlocking of the two threads in the fabric.

This tendency of the tension of the under thread to increase as the thread becomes exhausted is counteracted in my improvement in the following manner: When the bobbin is full, the thread, in drawing from the bobbin, is drawn in the course indicated by the line L shown in the case G, Fig. 2, and in its passage through the tension-regulating notch it is drawn with sufficient force against the rim of the bobbin-case to materially increase its tension, while, as the thread becomes exhausted it draws more and more in the direction of the line M in the same figure, which diminishes the friction caused by its passage through the notch. Also, as the thread draws more in the latter direction it has a tendency to lift the bobbin, and thereby diminishes the friction between the lower edge of the bobbin and the case, which tendency increases as the thread approaches the center, and though the desired effect is due more to the former than the latter, the result of these two influences is a uniformity of tension upon the under thread unattainable with the open bobbin.

I do not confine myself to the exact location of the tension-regulating notch in relation to the leader H, shown in the drawing; but it may be moved farther to the right or left, to exert more or less of this controlling influence upon the under thread, as extended experience may prove necessary.

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

1. The bobbin-case G, provided with the tension-regulating notch K, in combination with the leader H, and stop E, all constructed to operate as shown and described.

2. The loop-controller I, in combination with the bobbin-case G, constructed to operate as shown and described.

ADAM C. VAN SANT.

Witnesses:

NICHOLAS ULRICH,
H. G. KREUTER.