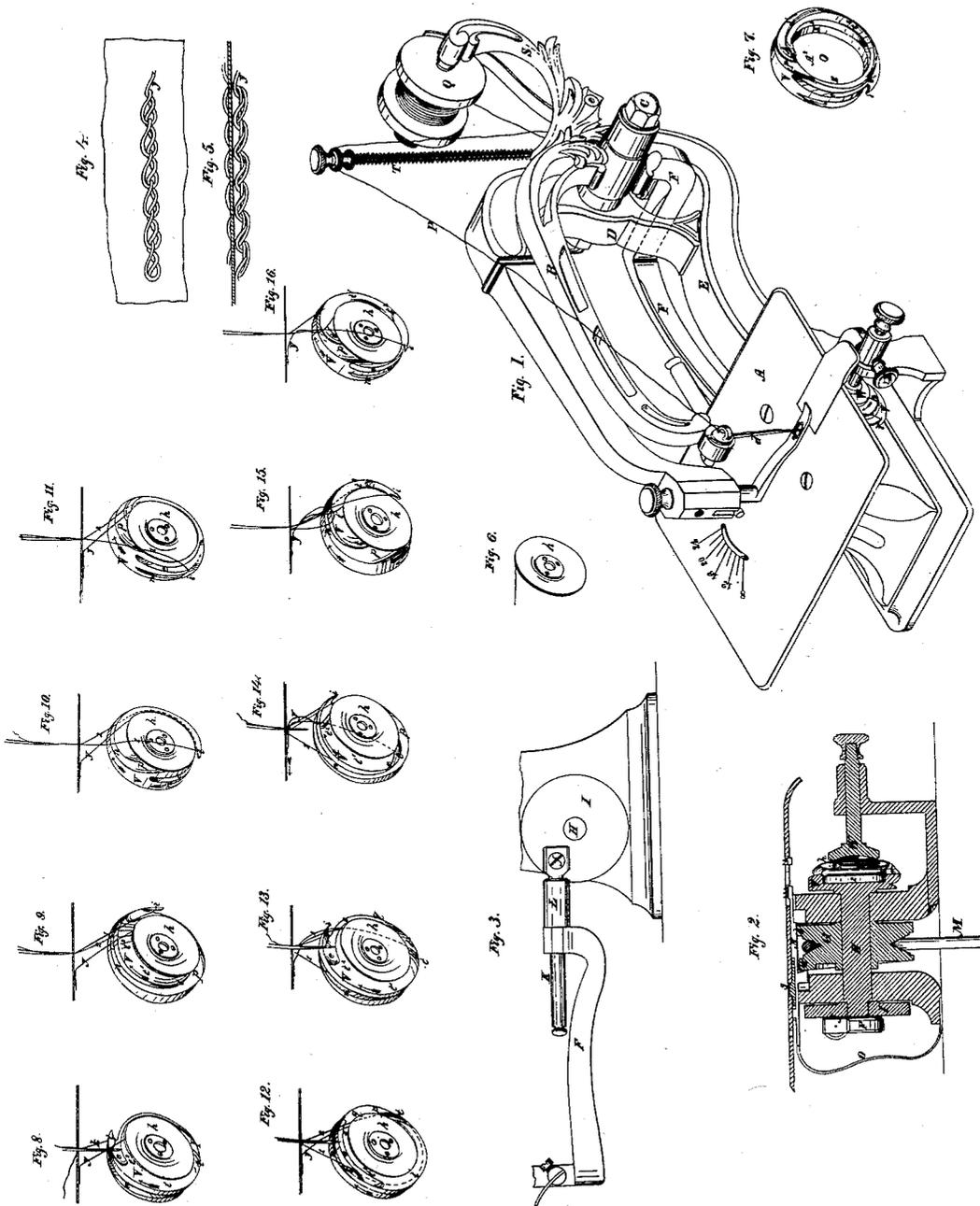


A. F. JOHNSON.
SEWING MACHINE.

No. 26,948.

Patented Jan. 24, 1860.



UNITED STATES PATENT OFFICE.

A. F. JOHNSON, OF BOSTON, ASSIGNOR TO A. B. ELY, OF NEWTON, MASS.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 26,948, dated January 24, 1860.

To all whom it may concern:

Be it known that I, A. F. JOHNSON, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Sewing-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a perspective view of my machine; Fig. 2, a vertical section through the rotary hook and bobbin; Fig. 3, a view showing the manner in which the needle-arm is driven; Fig. 4, a plan of the under side of my stitch; Fig. 5, a side view of the same; Fig. 6, a view of the bobbin; Fig. 7, a perspective view of the revolving hook; Figs. 8 to 16, details illustrating the formation of the stitch.

My present invention is designed to carry out another invention of an improved "locked chain-stitch" for which I have made application for Letters Patent simultaneously with the application for this; and my invention consists in the employment of a rotary hook and a needle, in combination with a shuttle or bobbin placed within the hook, the three being so constructed and arranged that the needle and rotary hook shall form a chain-stitch with a single thread, and the bobbin shall pass a second or binding thread through the loops of the chain-stitch to lock them and prevent the seam from raveling out.

That others skilled in the art may understand my invention, I will proceed to describe the method in which I have carried it out and the construction and operation of my machine.

In the accompanying drawings, A is the table; B, the needle-arm, which vibrates around a pin, C, projecting from a standard, D, rising from the bed-plate E. To the hub of the arm B is secured an arm, F, through which motion is communicated to the needle-arm as follows: A band, M, from a driving-wheel beneath (not seen in the drawings) passes over the pulley G upon the shaft H, to one end of which is secured the disk I. From this disk projects a pin, *f*, which serves as a pivot to the piston or rod K, that slides in a long socket, L, in the end of the arm F, and thus, as the shaft H revolves, the arm F is vibrated up and down, and with it the needle-bar B.

The feed-bar N is seen in section in Fig. 2. It is raised to engage its teeth with the goods

by a cam, *b*, upon the periphery of the pulley G, and traversed to give the feed by a cam, *a*, upon the face of the same pulley, the feed-bar being kept in contact with this cam by a spring, *o*. The throw of the feed-bar is adjusted by an eccentric, *g*, pivoted to the under side of the table, having an arm or handle, by which it is moved by the operator. The feed-bar also carries a point, *c*, which projects up through a curved slot in the table, and indicates by the graduation around the slot the number of stitches made to the inch.

These devices are more fully set forth and described in a third application for patent made simultaneously with this and with the before-mentioned application for the improved locked chain-stitch.

I will now proceed to describe more particularly my improved stitch and the mechanism by which it is formed.

An eye-pointed needle, *d*, such as is ordinarily employed in chain-stitch machines, is secured to the needle-bar, and carries a thread, P, which passes from a spool, Q, hung upon an arm, S, projecting from the needle-bar. From this spool the thread passes through an eye upon the frame of the machine, and thence through the take-up T to the needle.

The stitch, which, as before stated, consists of a chain-stitch having a binding-thread passed through each loop, is formed as follows: The revolving hook, which acts, in connection with the needle, to form the chain-stitch, is secured to the shaft H, and is formed as seen in Figs. 7 to 16. The bobbin *h* is seen detached in Fig. 6 and in section in Fig. 2, the binding-thread *y* (seen in red in Fig. 2) being inserted in the bobbin in the customary manner. The bobbin is held loosely up to the face of the hook V by a holder, W, which is kept in place by the thumb-screw X. The rotary hook V is formed with a flange or hoop, X², attached to a disk, A², and carries a point, *i*, which takes the loop from the needle, and a slot, *e*, immediately in front of the point, which is cut through to the open space Z in its center, Fig. 2. This slot has for its object to permit the needle to pass the point *i* without striking or interfering with the body of the hook. Upon the opposite or rear side of the point *i* there is a groove, *n*, which extends about two-thirds round the hook and runs out upon its front surface at *p*, this front surface of the hook

around the portion $t't''$ projecting beyond the surface of the bobbin, in order to guide the thread over or in front of the latter, while the remainder of the front surface of the hook is cut down below the bobbin, to permit the loop at the proper time to pass beneath the bobbin, as will be presently described. At the point where the groove n runs out to the surface of the hook a shoulder, t , is formed by the end of the projection $t't''$ of the hook, which holds on to the old loop, as seen in Fig. 13, until a new loop is taken from the needle, and thus the point of the hook is prevented from becoming entangled with the old loop. This is an essential feature of my hook, and does away with the necessity of the leather pad heretofore employed upon machines operating with a revolving hook. Commencing with the parts in the position represented in Fig. 8, the needle having descended in the slot e in the hook immediately in front of the point i and commenced its return motion, the point i having taken a loop, K , from the needle, as the hook continues to revolve in the direction of its arrow it enlarges the loop, while the needle rises above the cloth, as seen in Fig. 9, the rear thread, 2, of the loop running in the groove n upon the periphery of the hook, the front thread, 1, being led by the projecting portion t'' of the hook outside or in front of the bobbin, as in Fig. 10. By a further revolution of the hook the thread 1 is carried entirely past the bobbin, Fig. 11, slips out from the point i , and remains in the groove n behind the point. When the parts have reached this position, as represented in Fig. 12, the thread 1, which was previously in front of the point i , is now behind it, and the thread 2, being guided over by the groove n , is in front of the hook, and the part pqs , being cut away, permits the thread Q to enter behind the bobbin. The needle now makes a second descent into the slot e of the hook and the point i approaches to take another loop. In Fig. 13 the point has taken its second loop and the needle is again rising. Fig. 14 shows the progress of the hook, the loop 1 2 being about to slip off the shoulder t and leave the hook. In Fig. 15 the loop has left the hook, and is about being tightened up by the operation of the hook while forming the next loop. The new loop now continues as before, as seen in Figs. 15 and 16, and so on continuously.

The operation of the above-described hook is peculiar in this respect, that the portion of the loop that passes over and around the periphery of the hook during the first portion of its revolution is carried during the latter part of its revolution behind the bobbin, and is therefore less liable to be caught by the hook as it again revolves. It will be observed that at the moment when a loop is taken, Fig.

13, the point i passes through the old loop, and consequently when this loop leaves the hook, Fig. 15, it is thrown over the new loop, and thus each loop is passed through the one which preceded it, and a chain-stitch is formed in the fabric. It was observed, however, before that the thread 1, which was at first in front of the point i , passes back behind it, Fig. 12, and the thread 2, which was at first behind the point, is led out by the groove n in front of it, and this twisting of the loop takes place before the next loop is formed, and before the bobbin, with its binding-thread, is passed through it. There is consequently a twist or half-turn in each loop of the seam, as seen in Fig. 4. It has also been stated that the loop, after having been twisted half-round, is passed entirely round the bobbin; and it will be observed that the loop, when it is taken off the needle, is behind the bobbin-thread, that it is then twisted and the bobbin is passed through it, as seen in Figs. 13, 14, 15, and 16. The binding-thread y is thus passed around under and through each loop of the chain-stitch, as seen in Figs. 4 and 5, thus causing the binding-thread, by its crooked course, to become elastic, which would not be the case were it simply passed straight through each loop of the chain-stitch. In Figs. 4 and 5 the chain-stitch formed from the needle-thread is represented in green and the bobbin or binding thread in red. By causing the hook, constructed as above described, to take the loop later with respect to the motion of the needle, or the needle to move sooner with respect to the motion of the hook, or by the use of a longer-pointed needle, whereby the point of the hook is caused to pass through the old loop before it takes a new loop from the needle, a shuttle-stitch will be formed; and by taking out the bobbin from the rotary hook, or by running it without the binding-thread, a chain-stitch will be formed the loops of which are twisted, as already described.

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

1. The rotary hook, constructed as described or in any manner equivalent thereto, in combination with a needle and a bobbin, for the purpose of forming a seam by the interlacing of two threads, as set forth.

2. The shoulder t , or its equivalent, for the purpose of preventing the point i from being entangled with the old loop, as set forth.

3. Passing that portion of the loop that lies in the groove n or around the periphery of the hook during the first portion of its revolution behind the bobbin, as set forth.

A. F. JOHNSON.

Witnesses:

SAM. COOPER,
P. E. TESCHEMACHER.