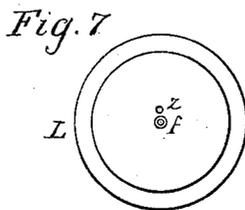
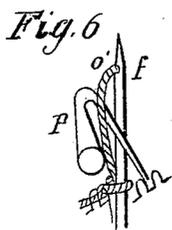
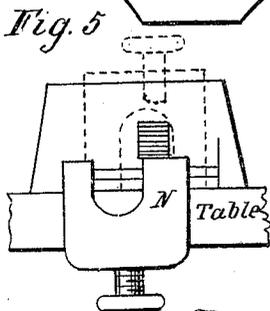
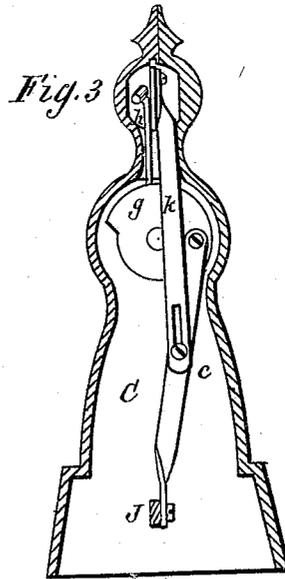
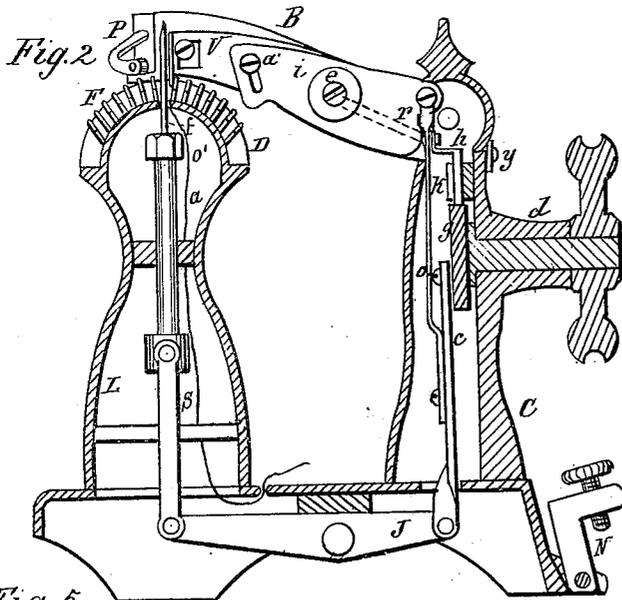
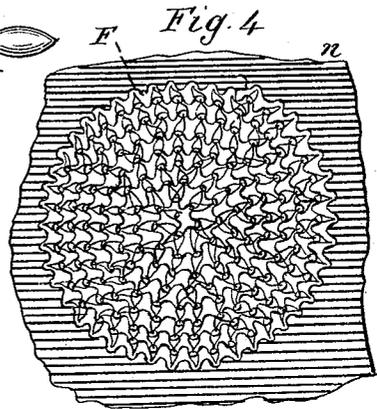
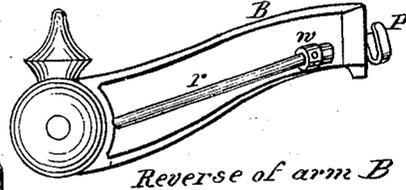
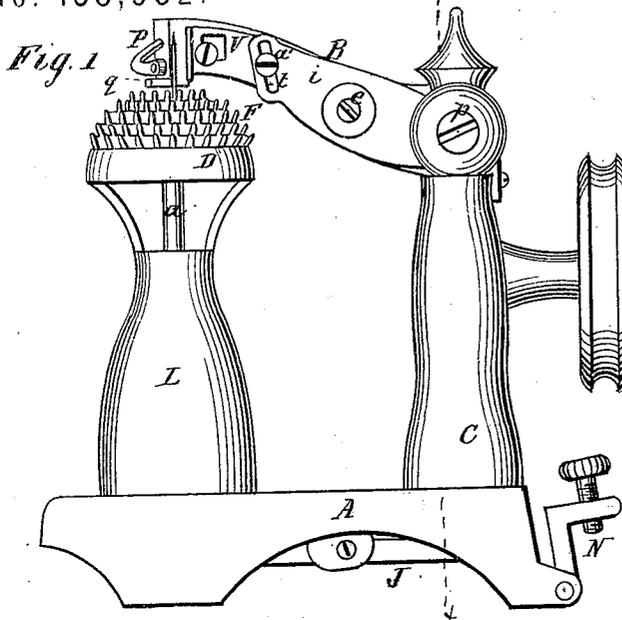


B. ARNOLD.
Machines for Darning Stockings.

No. 138,982.

Patented May 20, 1873.



Witnesses *Frank H. Arnold*
James E. Arnold

Inventor
Benjamin Arnold

UNITED STATES PATENT OFFICE.

BENJAMIN ARNOLD, OF EAST GREENWICH, RHODE ISLAND.

IMPROVEMENT IN MACHINES FOR DARNING STOCKINGS.

Specification forming part of Letters Patent No. **138,982**, dated May 20, 1873; application filed September 26, 1870.

To all whom it may concern:

Be it known that I, BENJAMIN ARNOLD, of East Greenwich, in the county of Kent and State of Rhode Island, have invented a new and Improved Machine for Mending Stockings and other Fabrics; and do hereby declare the following to be a full and correct description thereof, reference being had to the accompanying drawing making part of this specification, and to the letters and numbers of reference marked thereon, similar letters and numbers being used in all the figures to denote the same part.

In the drawing, Figure 1 is a front elevation of the machine. Fig. 2 shows a vertical longitudinal section taken through the middle of the machine. Fig. 3 shows a vertical cross-section taken through the standard in the direction of the line *x x*, Fig. 1. Fig. 4 is a top view of the cap D with the stitches on it. Fig. 5 is a back view of the clamp. Fig. 6 shows how the looper carries the loop onto the point in front, enlarged. Fig. 7 shows the top of the standard L with cap D taken off.

My invention consists in a spherical or flat cap, having a spiral or circular motion, and provided with a spiral or involute comb, with teeth on its upper edge to hold the work and receive the stitches, which are formed by an eye-pointed needle working through the comb, and also in certain devices applied to an arm projecting out over the cap, for communicating the feed-motion and operating the looper to cast the stitches onto the teeth of the comb.

The construction is as follows: A is a platform or table, on one end of which is placed a hollow standard, C, holding the arm B, shaft *d*, and cam *g*. L is another hollow standard, holding the needle-bar *a* and cap D, over which the fabric to be mended is placed. J is a lever hung underneath the platform, and connected at one end to the needle-bar by the bar *s*, and at the other end by the rod *c* to a pin, *o*, in the face of the cam *g*, which serves as a crank to give motion to the needle-bar and needle *f*. *v* is the feed-lever, moving on the pin *e* in the arm B. This lever has an up-and-down and forward-and-backward motion given to it by the lever *i*, which moves it by means of the pin *a'* in the diagonal slot *t*. *r* is a rod

that moves the looper P, being connected to the looper-shaft by a universal joint, *w*, to change the direction of its motion. The rod *r* has an arm on its inner end connected to the rod *h* which rests on the cam, *g*, Figs. 3 and 2. The lever *i* is moved by the bar *k*, which connects it to the rod *c*, a slot being made in the lower end of the bar to shorten the distance moved. The comb F is made of a strip of metal wound in an involute form, and if made in a spherical shape, as shown in Fig. 1, the plane of the strip should be in the radius of the circle of the sphere; but if made flat, the plane of the strip should be vertical; but whether made spherical or flat, the other parts of the machine remain the same. The shaded lines *n* in Fig. 4 represent the fabric to be mended, the edge of the work around the hole being put on the outside row of points. The cam *g* has a part of one side cut away to allow the rod *h* to drop down, that the other side may raise it again and operate the looper P. The arm B is fastened to the standard C by the screw-pin *p*, which allows it to be raised a little, so that the stocking can be put on the cap D. The clamp N, for holding the machine steady, is made so as to be turned up out of the way when not required by sliding it sideways on its pin, as shown by the dotted lines in Fig. 5.

The operation is as follows: The arm B being raised a little, the stocking is put on the cap D, the hole to be mended being brought over the center, and the cap itself is raised a little to clear the guide-pin *z*, Fig. 7, and tipped over to the front until the guard *q* that keeps the stitches on the points is just over the edge of the stocking on the further side of the hole, so that when the needle rises it shall come up through the border of the hole. The arm B is then fastened down, and by turning the wheel H the needle will be pushed up through, carrying the yarn *o'*, and as it descends it forms a loop, which the looper P enters, (see Fig. 6,) and guides down onto the point in the next row that is nearest opposite to the needle. As the needle descends, the feed-lever *v* descends into a space between the points, and pushes the next point in the row over the needle, ready for its next rising. The first time around the needle rises through

the edge of the stocking around the hole; but in the successive rounds after the first, the needle rises through a loop on the point over *t*, thrown on in the previous round, thus making a new loop through the old one each time, which produces the common knitting-stitch. As the number of points grows less in each successive row, it follows that there will not always be one directly in front of the needle to receive the new loop, in which case the looper is broad enough to drop the loop on the one nearest in front, and in this way two loops will sometimes come on one point, which will cause the narrowing necessary to close the hole up in the center.

Having thus described the construction and mode of operating the machine, what I claim as my invention, and desire to secure by Letters Patent, is—

1. The spiral or involute comb *F*, constructed and operating substantially as herein described, and for the purpose specified.

2. The combination of the needle *f* and looper *P* with the comb *F*, substantially as and for the purpose specified.

3. The combination of the two levers *v* and *i*, operating substantially as shown and described, to produce a motion suitable for a feed-motion.

4. The clamp *N*, made so that it can slide and be turned up out of the way when not in use, substantially as shown and described.

BENJAMIN ARNOLD.

Witnesses:

FRANK H. ARNOLD,
JAMES E. ARNOLD.