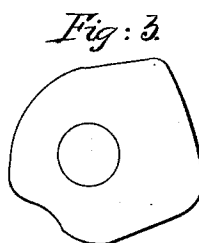
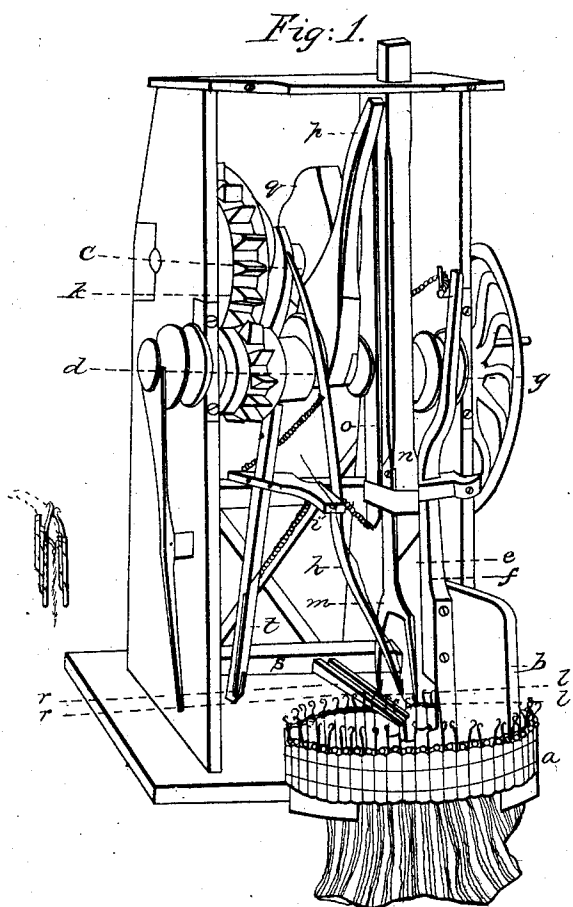


E. COLVIN.  
RIBBED HOSE TOP KNITTER.

No. 16,375.

Patented Jan. 13, 1857.



*Fig: 2.*



Witnesses:

*J. H. Hough*  
*Edwin Edgerton*

Inventor:

*Ernest Colvin*

# UNITED STATES PATENT OFFICE.

ENOCH COLVIN, OF POULTNEY, VERMONT.

## KNITTING-MACHINE.

Specification of Letters Patent No. 16,375, dated January 13, 1857.

*To all whom it may concern:*

Be it known that I, ENOCH COLVIN, of Poultney, in the county of Rutland and State of Vermont, have invented a new and useful  
5 Machine for Knitting Ribbed Tops for Stockings, of which the following is a full and exact description, having reference to the accompanying drawings and the letters thereon.

10 I employ two flattened circles, one inside of the other, (*a*) each containing fifty needles, such as are in use for knitting plain hose by machinery, or more if wanted. Every other needle is cut off at the top of  
15 the stocking. The hooks of those in the outside circle are turned outward, and the others reversed, and every whole needle stands against and over one in the other circle which has been cut off. The outside circle  
20 is sustained by two shelves which stand end to end far enough apart for the whole work to fall between them. The ends of these shelves, which look toward each other, are hollowed out in a semicircular form, and  
25 have rims or flanges of sheet-iron, steel or the like rising nearly as high as the stocking work, around which the outside circle of needles moves, and which keeps the circle in its place and suitably stretched. Inside of  
30 the double circle is another shelf sustained by a bent arm (*b*) attached to the frame at such a height as to permit the circle to pass under it. This shelf fills the circle and follows the curves in the ends of the other two,  
35 at such a distance that the stocking drops freely between them. It sustains the inside circle of needles, and also a spring which presses against them at a short distance from the point where the stitch is made, and  
40 keeps that part of the circle straight and taut.

The movements of the machine are all obtained from two shafts, one above the other and geared to it so that the lower shaft has  
45 twice the motion of the upper one, (*c* and *d*.)

The double circle is carried around by two feeders (*e* and *f*) such as are used in like machines; the upper ends of which are adapted to and move in grooved eccentrics  
50 (*g* G Fig. 2) on the fast shaft, and are kept to it by india rubber or coiled wire springs. The eccentrics are so constructed that the feeders approach one another, or recede together. As soon as a stitch is made they  
55 open, and a curve in the grooves throws them to the left to the distance of one needle

from another. They are directly brought together again, and clasp the double circle of needles, when another curve in the grooves in the eccentrics moves them to the right,  
60 carrying the circle along with them, and bringing forward another needle. While the work of making a new loop or stitch is going on the feeders are kept closed and hold the work steady. The rim or flange upon  
65 the right-hand shelf is carried around on the backside between the outside needles and the fabric woven, so that the back feeder presses against it. Another corresponding flange is secured to the inside shelf rising  
70 between the inside needles and the fabric, and sustaining the pressure of the inside feeder as well as of the spring on the inside shelf above described.

The yarn is carried by a yarn guide, (*h*)  
75 the arm of which is secured by a pivot to a fast arm of the frame (*i*). Upon this pivot the first arm plays back and forth, and with it the guide just above the needle hooks. This motion is derived from an eccentric (*h*)  
80 upon the upper or slow shaft, against which the arm is held by a spring. As the yarn guide moves backward over the circle, the yarn is caught on one of the inside needles, and on one of the others when it returns. 85

Two hooks are necessary, one standing directly behind the other (*l* *l*), an inch and a half or two inches from it, one being usually inside the circle, the other behind it, and equally distant from it, and both turned  
90 toward each other. They are carried at the ends of a fork (*m*), with prongs long enough to play clear of the work, and carried by an upright arm. This arm moves up and down in a groove in the upper part  
95 of the frame, and in a sleeve at the lower part. The sleeve is secured to another arm (*o*) which hangs from the frame at the top so as to swing back and forth, and lies close against the other or hook arm. An up and  
100 down motion is given to the latter or hook arm by means of a third one (*p*) to which it is attached by a bolt or pivot at the top, and the lower end of which is carried by an eccentric or crank on the fast shaft. The  
105 hook arm is also moved back and forth by an eccentric (*q* Fig. 3) on the slow or upper shaft, against which another spring constantly presses the hanging arm, to which the hook arm is secured by the sleeve. 110

The motions of the yarn guide and hook arm are so adapted to each other that when

the yarn guide carries the yarn from the inside backward, and on its way catches it on one of the inside needles, the inside hook is carried back into the groove of the same  
 5 needle, then rises, taking the loop that was before upon the needle, and carries it up, over and back of the needle, thus embracing in a new stitch the yarn just hitched upon the needle making of it a new loop. The  
 10 hook then is lowered, dropping the new stitch and is carried forward past the needle to its former position inside the circle. The feeders now bring another and an outside needle around; the yarn guide moves forward and catches the thread upon it; the  
 15 backside hook moves forward, takes up the old loop upon it and carries it over, making a new stitch and leaving a new loop on the needle, and then retires backward to its  
 20 former position.

Lest the hooks in returning to their positions should strike the needles a cam is placed obliquely on the fast shaft (or two on the other,) so as to strike a block upon  
 25 the hanging arm to which the hook arm is secured by the sleeve, and crowd the hooks slightly to the left.

A pair of pressers (*r r*) contributes to relieve the hook from the loop and at the same  
 30 time crowds the work down. They are moved up and down by being secured at one end to a rock shaft (*s*) which carries an arm (*t*) extending upward and kept by another spring snug to an eccentric on the fast shaft.

35 The left hand shelf of those first de-

scribed, should be secured only by a thumb screw in a slot, so that it may be moved to the left when a larger article is manufactured, or the reverse.

Two or more pairs of hooks may be attached to the hook arm, parallel to each other, so as to knit with two or more threads at once.

The yarn as it is wound on the spool should be broken into suitable lengths for  
 45 each stocking top. The end should be doubled back as far as it is wanted for commencing a new top, and the loop should be tied to the next length of yarn by a cotton thread long enough to go once around. The  
 50 tops when made can be rapidly separated by cutting out the cotton thread.

Machines are already in use, in which a single circle of needles is employed for knitting plain work with machinery similar in  
 55 some respects to that above described; and I make no claim to any part of such machinery. But

What I do claim as my invention, and desire to secure by Letters Patent, is the following, viz.

1. The use of two circles of needles as above described for knitting a ribbed fabric.
2. The method of moving the feeders as above described, by means of grooved eccen-  
 65 trics with curves in the grooves.

E<sup>N</sup>OCH COLVIN.

Witnesses:

S. H. HODGES,

EDWIN EDGERTON.