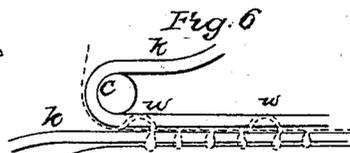
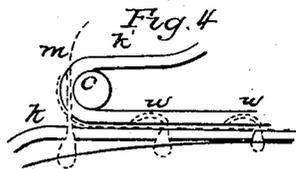
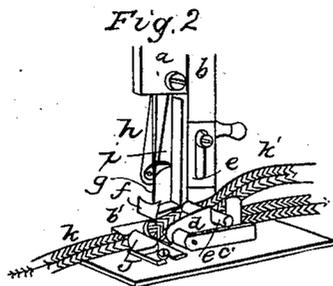
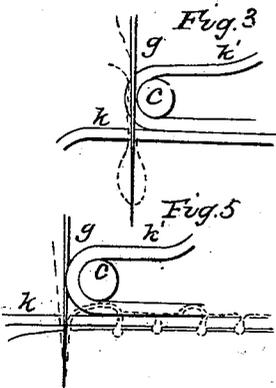
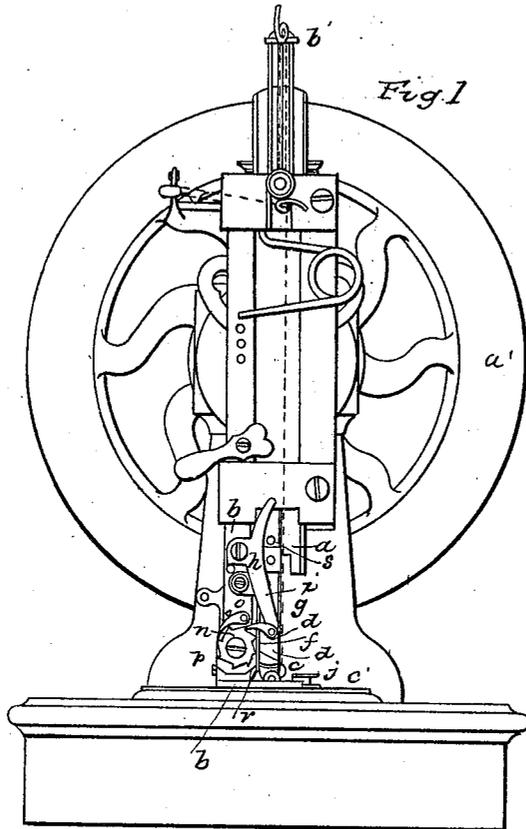


C. F. BOSWORTH.

Sewing Machine.

No. 38,807.

Patented June 9, 1863.



INVENTOR
C. F. Bosworth

UNITED STATES PATENT OFFICE.

C. F. BOSWORTH, OF NEW HAVEN, CONNECTICUT.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 38,807, dated June 9, 1863.

To all whom it may concern:

Be it known that I, C. F. BOSWORTH, of the city of New Haven, in the State of Connecticut, have invented certain new and useful improvements to be used in combination with sewing-machines, whereby such machines are better adapted to the sewing of braid or plaiting or other narrow strips of material, the improvements being chiefly applicable to stitching together braids of straw, hair, chip, palm-leaf, &c., in the manufacture of hats, caps, and bonnets.

These improvements are fully, clearly, and exactly hereinafter described in connection with the drawings, which make part of the description.

In the drawings, Figure 1 is a front elevation of a sewing-machine with my improvements attached. Fig. 2 is a view in perspective of the improvements and certain parts of the sewing-machine. Figs. 3, 4, 5, and 6 are sketches exhibiting on a large scale the roller over which a piece of braid is to be fed, and illustrating some of the varieties of stitch that may be made by the use of my improvements.

Braids of straw, &c., are usually sewed together by hand. The stitch commonly employed is a long one and of such a character that little or none of the thread appears upon what is usually termed the "right" side, and sewing-machines without my improvements are practically useless for the purpose, as all of them that I know of sew a seam showing upon the right side a thread reaching from needle-puncture to needle-puncture the whole length of the seam.

My improvements are applicable under certain changes of form to most if not all of the sewing-machines now in use and making different varieties of stitch, the precise method of confining the loops of upper thread passed through the goods by an eye-pointed piercing needle being immaterial so far as the sewing of straw is concerned; but I have experimented chiefly upon shuttle-machines and reduced my invention to practice on such a machine, and have in the drawings shown my improvements as applied to and acting in combination with a Singer shuttle machine with a transverse shuttle. These and other sewing-machines are so well known in the market and to manufacturers and workmen that any detailed

description of the construction or operation thereof is deemed unnecessary.

The nature of my invention consists, first, in the combination of a roller or its equivalent with the needle of a sewing-machine and the feeding apparatus thereof when the three are arranged and act in combination with each other, substantially as specified; and, also, in the combination, with a sewing-machine needle and a roller or bending-surface, of a contrivance for guiding the needle itself at some points above the material being sewed, thus forcing the needle to pierce a proper distance from the roller, as hereinafter set forth; and my invention also consists in combining with a sewing-machine needle and a roller or its equivalent for making a turn or bend in braid to be sewed a vibrating needle-guide or proper apparatus for vibrating a needle, the operation being to cause the needle to pierce braid nearer to or farther from the surface of a roller.

In the drawings the fly-wheel of the machine is shown at *a'*, the needle-bar at *a*, the needle at *g*, the take-up apparatus at *b'*, and the table or surface upon which the goods to be sewed are supported at *c'*, and the machine has a feed apparatus of any known kind which is capable of advancing braid, &c., to be stitched between a presser-foot—such as *b*—and a table, and also a shuttle carrying a bobbin of second or under thread, colored blue in the drawings, so moved and operated as to confine loops of needle-thread passed through braid by the piercing-needle.

The distinguishing peculiarity of the stitch made by the use of my improvement is this—namely, that the piercing-needle and the thread it carries enter a piece of braid from the side that is nearest to the other piece of braid to which it is to be sewed and leaves that first piece of braid on the same side at which it entered. This is the leading idea on which my invention is based, and the improvements carry this idea into practice. There is therefore attached to the presser-foot bar or to some other convenient part of the machine a frame, *c'*, which carries a roller, *e*, whose axis is at right angles, or nearly so, with the line of progression of the cloth.

The upper of the two pieces of braid to be stitched together, *k'*, passes over the roller, then under it, and thence over the other piece

of braid, *k*, and the roller holds one piece down upon the other. In order to keep the upper braid in position sidewise, there is an adjustable gage, *d*, which may be attached to the frame *e'*, and in order to make the upper braid apply itself closely to the roller there is supported in the frame or attached to the presser-foot another bar or roller *e*, which rests upon the surface of the braid. I prefer to attach this bar to a slide, *e'*, claspings the presser-foot rod and adjustable thereon by a set-screw, so that the bar or roller may be set to adapt itself to different thicknesses of braid.

In order to guide the under piece of braid, there may be attached to the table a guide, *j*. In sewing with the contrivance as thus far described a single piece of braid or the braid on the edge of a number of pieces already stitched together is to be introduced under the presser-foot, (see Fig. 2,) and another piece of braid is to be passed under the bar *e*, and thence over and under roller *e*. If *e* be properly set with reference to the needle, it will pass into the upper braid, out of it again on the same side that it entered, and thence through the lower one, (see Fig. 3,) and its thread may appear on the upper surface, as in Fig. 6 at *w*; or if the braid be thick or the roller farther from the needle the thread may not appear at all on the upper surface, but assume a position as shown at *w*, Fig. 4; and when the loop has been secured below the lower braid and the needle has risen out of both pieces then the feed will advance both braids, and in so doing will carry the upper one over the bending-roller, so that it may be pierced at a different spot on the next descent of the needle, the feed and roller by their combined action presenting the upper braid properly. This operation would not, however, be as certain as desirable, owing to the springing of the needle. I therefore set the needle so that it will not pierce the upper piece of braid at all unless it is bent or sprung over toward the roller on its descent, and apply to the presser-foot or other convenient support a guide—such as *f*—which springs the needle over toward the roller when the needle-point enters the guide. A bent piece of metal with a conical hole in it, or a simple surface standing nearly upright, but inclining away from the needle at its upper edge, answers the purpose well. The guide shown in the drawings has two surfaces meeting at an angle or apex, through which the needle passes. By means of this addition the needle is forced to pierce in the desired line and the operation of sewing is rendered certain. The loops of needle-thread passed through the lower braid are to be confined by a shuttle-thread, as shown in the drawings, or by a looped thread, as in the Grover & Baker stitch machines, or by a loop of the upper thread, as in crochet-machines, and the stitch is drawn tight when it has passed or just as it is passing away from the roller.

As the seam is stronger when the needle-thread shows on the upper surface, and as it

is desirable that it should show only at long intervals, farther apart than can be conveniently fed or sewed in a sewing-machine in the interval between one stitch and another, I have devised a contrivance by the use of which some of the stitches will be made in the lower braid only. In order to do this, the needle is set, as before, and the guide is mounted upon a spring-arm, which tends to press it toward the roller *e*, while an adjustable stop, *r*, (see Fig. 1.) regulates the distance to which it shall approach the roller.

Upon the presser-foot bar there is mounted, so that it can turn, an irregularly-polygonal plate, *p*, having secured to it a ratchet-wheel, *n*, provided with a detaining-pawl, if necessary, as at *O*, and with an actuating-pawl—such as *i*—pivoted to a crooked bar, *h*, which is pivoted on the presser-foot. A pin, *s*, is attached to the needle-bar, and the crooked bar and pin are so arranged relatively to each other that each stroke of the bar shall reciprocate the pawl, and consequently turn the irregular plate which bears against the spring-support of the guide. By shaping this plate properly the needle can be caused to pierce the upper piece of braid at every other stitch, or every second, third, or fourth, or greater number of stitches, as desired, so that seams may be sewed like those in Fig. 5 or 6; or by proper shape and adjustment of the parts seams may be sewed where the upper thread shows at intervals on the upper surface of the upper braid, and at other times merely catches into the upper braid; or seams may be sewed having some stitches showing in the upper surface of the upper braid, others catching into it and not showing, and others still which do not touch the upper braid at all. In sewing such seams the needle springs away from the roller, and is drawn toward it at the time and to the extent desired by the spring-guide, the latter being governed by the irregularly-shaped plate. The whole contrivance therefore is one for vibrating the needle to and fro in the direction of the line of the seam, and any contrivance that will so cause the needle to vibrate as to pierce or not pierce the upper braid, as desired, may be substituted for the apparatus specially described. Where a vibrating needle as thus described is used the feed apparatus feeds both the upper braid and the material to which it is to be stitched, as before stated, and presents both braids in such manner by the aid of the roller that the needle may puncture either both braids or one braid only, depending upon the line in which the needle descends.

The roller *e* may revolve or be stationary. I prefer that it should revolve; and the bar *e* and guide *d* may be dispensed with, and the braid be kept in position by the fingers, the gist of the invention being to hold one piece of braid in reference to the braid or other material onto which it is to be stitched, and in reference to the needle in such manner that the needle shall enter and leave the upper braid on the same side thereof, and shall afterward pierce

the lower braid or piece of stuff to which the upper braid is to be sewed. As before stated, any proper feeding apparatus may be used; but I prefer that commonly known as the "four-motion roughened surface-feed," or else the wheel-feed.

As the braids to be sewed together are sometimes of considerable thickness, and as one lies on top of the other, the uppermost braid will be held slightly above the table or platform of the machine. An ordinary feeding-bar will therefore act most effectually if not entirely on the lowermost braid; but as the sewing, owing to the great length of the stitches, will be better if the feeding device acts equally on both braids, I intend sometimes to use independent feeds—one adjusted for each braid—and when using a four-motion feed to split the feeding-bar at or about the line of junction of the braids, thus making two feeding-bars, and to apply a set-screw or some equivalent device, so that the two bars may have their relative height or levels adjustable the one to the other, thus causing that bar which acts upon the uppermost braid to work at the highest level, so that this braid may be as effectively fed as the lower one. In sewing hat-brims and other curved work one braid—that nearest the center of the hat—must of necessity move through a less distance than the other; and in order to make the feed adapt itself to both, so as not to wrinkle either, and in order, also, to regulate the curvature of the seam, I intend to make one feed move at each stitch through a greater distance than the other does. This object may be attained most easily by advancing two feeding-bars by the same cam, and by regulating their retreating motion by separate stops, one

or both of which may be adjustable and acting like the adjustable feed-regulators well known to constructors of sewing-machines.

I do not claim a vibrating needle simply, nor a guide for a needle, nor rollers or bars or guides for cloth or braid by themselves, or out of the combination in which I employ them so as to produce the desired effect; but

I do claim as of my own invention—

1. The combination, of a sewing-machine needle with a roller or its equivalent and with a feed apparatus or mechanism, when the needle and roller are so arranged relatively to each other that braid can be sewed by a needle piercing and leaving the braid or other material on the same side thereof, the combination being substantially such as described.

2. In combination, a sewing-machine needle, a roller or its equivalent, around which braid can be bent, and a needle-guide, the three being arranged and acting in combination, substantially as specified.

3. A vibrating sewing-machine needle, or a sewing-machine needle caused to vibrate by proper mechanism, substantially as specified, in combination with a roller around which braid can be bent or turned, and any appropriate feed apparatus, the mode of operation of the combination being substantially such as set forth.

In testimony whereof I have hereunto subscribed my name on this 8th day of August, A. D. 1861.

C. F. BOSWORTH.

In presence of—

HORACE H. CHITTENDEN,
J. H. STARKWEATHER.