

STRAW SEWING MACHINE CO. *v.* EAMES.

Circuit Court, S. D. New York. December 23, 1880.

1. RE-ISSUE No. 7,985.

Re-issue No. 7,985, for an “improvement in sewing machines,”
is *not void* as to the first three claims for want of novelty.

2. SAME.

There is no departure in such re-issue from the original,
which in any manner affects the validity of the third claim
of the re-issue.

3. SAME—INFRINGEMENT.

The first three claims of such re-issue *held to be infringed*,
although there were certain formal structural differences in
the infringing machine.—[ED.]

In Equity.

S. J. Gordon, for plaintiff.

Strawbridge & Taylor, for defendant.

BLATCHFORD, C. J. This suit is brought on re-issued letters patent granted to the plaintiff, December 11, 1877, (No. 7,985,) for an “improvement in sewing machines,” the original patent, 38,807, having been granted to Charles F. Bosworth, June 9, 1863, and re-issued to the plaintiff, June 1, 1875. The specification of No. 7,985 reads as follows, including what is inside and what is outside of brackets, and omitting what is in italics: “Be it known that I, C. F. Bosworth, of the [town of Milford] *city of New Haven*, in the state of Connecticut, have invented certain new and useful improvements [in] *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 braid, chip, palm-leaf, etc., 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 182 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, etc., 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 conforming 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. [My] *The nature of my invention consists [of certain combinations of mechanical devices which are set forth in the claims at the close of this specification.] 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

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further from, the surface of a roller. In the drawings, the flywheel 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, etc., 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 improvements is this, namely: that the piercing-needle [with] *and* the thread it carries enters 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 [work] *cloth*. The upper of the two pieces of braid to be stitched together, *k'*, passes over this 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 gauge, *d*, which may be attached to the frame, *c'*, [and operates upon one edge of the braid, and I have represented another gauge, *l*, which operates at the opposite edge of the braid,] 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'*, clasping 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 184 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 [the latter] *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 further 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* [when] the loop [of needle-thread] 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 bonding 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. The operation would not, however, be as certain as desirable, owing to the springing of the needle [by the glancing of its point from the bent surface of the braid.] 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 towards 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 towards 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 [of such guide] *well*. The guide [*f*] 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 185 shows on the upper surface, and as it is desirable that it should show only at long intervals, further 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 [so that it will not pierce the upper piece of braid at all, unless the needle is bent or sprung over towards the roller on its descent, and the needle-guide, *f*,] *as before, and the guide* is mounted upon a spring arm

which tends to press it towards the roller, *e*, while an adjustable stop, *r*, (*see fig. 1*), regulates the distance to which [the needle-guide] *it* shall approach the roller. Upon the presser-foot bar there is mounted, so that it can turn, an [irregular] *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 [needle] 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 *figs. 5* [and] *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 catch the upper braid at all. In sewing such seams the needle springs away from the roller, and is drawn towards it at the time and to the extent desired by the spring guide, the latter being governed by the [irregular] *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 186 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 especially 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 on to 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 afterwards pierce the lower braid or piece of stuff to which the upper braid is to be sewn.* 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 heights 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 covered 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 187 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 motions 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 combinations in which I employ them, so as to produce the desired effect.” Omitting from the foregoing specification the parts enclosed in brackets, and taking in what is in italics, produces the original specification. The claims of the re-issue are as follows: “(1) The combination, substantially as before set forth, of an eye-pointed needle, a roller or its equivalent, over which the braid to be sewed is bent, a feed apparatus or mechanism, a gauge for the upper braid, and a guide for the lower braid; (2) the combination, substantially as before set forth, of an eye-pointed needle, a roller or its equivalent, over which the braid to be sewed is bent, a feed apparatus, two gauges for the upper braid, (one at each of its edges,) and a guide for the lower braid; (3) the combination, substantially as before set forth, of an eye-pointed 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; (4) the combination, substantially as before set forth, of a vibrating eye-pointed needle, substantially as specified, with a roller, around which braid can be bent or turned, and feed apparatus; the mode of operation of the combination being substantially such as set forth.” The claims of the original patent were as follows: “(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 needleguide, the three being arranged and acting in combination substantially as specified; 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."

It is contended, for the plaintiff, that the defendant's machine infringes the first three claims of No. 7,985. In No. 7,985 the fresh piece of braid which is to be sewed to the partially-completed work passes to it at its upper side, while in the defendant's machine the fresh piece of braid passes to the needle at the under side of the partially-completed work. In No. 7,985 the stock of the roller over which the braid is bent has its plane parallel with the table, while the corresponding device over which the braid is bent in the defendant's machine has the plane of its stock perpendicular to the table. Nevertheless, it is claimed that the defendant's machine has in combination all the elements of the first three claims of No. 7,985.

It is apparent, from the original specification, that Bosworth had two separate arrangements in connection with a needle-guide. He had a guide to guide the needle above the material to be sewed at every stroke of the needle, the needle being set so that it would not, but for the needle-guide, pierce the upper piece of braid at all, and the needle-guide being so arranged

as to deflect, or bend, or spring the needle over, in its descent, towards the roller, and cause it to pierce the braid. The description and the drawings show that the needle could not pierce the braid at all unless pressed over by the needle-guide. The second arrangement in connection with the needle-guide was the polygonal plate and its connections, to vibrate the needle-guide and the needle laterally, and cause the needle to pierce nearer to or further from the roller; the needle being, 189 however, set as before, so as not to pierce at all unless sprung over by the needle-guide. In the specification of No. 7,985 the feature of the setting of the needle so as not to pierce at all unless sprung over by the needle-guide, and the necessity of the springing of the needle over by the needle-guide at every stroke, is omitted as an existing feature where the needle does not vibrate laterally, and is retained as a feature only when the needle vibrates laterally. In the original specification it was a necessary feature both when the needle did not vibrate laterally and when it did. The defendant's machine has no lateral vibration of the needle, nor any corresponding vibrating movement of the needle-guide. Nor, in the defendant's machine, is the needle set so as not to pierce unless sprung over by a needle-guide, nor is there a needle-guide which springs the needle over towards the bending device when the needle-point enters the guide. The specification of No. 7,985 is altered so as, when no vibration of the needle is employed, to make the operation of the needle-guide an operation merely to prevent the glancing of the needle-point from the bent surface of the braid. 'Yet the needle-guide in Bosworth's original specification had an operation to prevent the glancing of the needle-point from the bent surface of the braid, although it had an additional operation to spring the needle over so as to pierce the braid. In the defendant's machine there is an arrangement which operates as a

needle-guide, so far as to prevent the glancing of the needle-point from the bent surface of the braid. In the original specification of Bosworth the feature of the needle-guide as preventing this glancing is set forth. That specification, when it speaks of "the springing of the needle," means the springing of the needle by the glancing of its point from the bent surface of the braid,—a springing which must ensue if not counteracted by the interposition of a bearing surface to resist. The apparatus described, to spring the needle over as it descends, necessarily involves the existence of the bearing surface to resist any tendency of the needle to glance off. The bearing surface to spring the needle over is the bearing surface to resist any 190 tendency of the needle to spring back. Hence, there is no departure in the re-issue from the original, which in any manner affects the validity of the third claim of the re-issue, and the needle-guide of that claim must properly be construed as a needle-guide which prevents the glancing of the needle from the braid, although it may not also spring the needle over towards the roller, and although it may not vibrate. It follows, also, from the foregoing observations, that the needle mentioned in the first three claims is not required to be a vibrating needle. The vibrating needle is a special construction, and is a feature of claim 4. The needle of the first three claims is a non-vibrating needle. The second gauge for the upper braid in the Bosworth machine is shown in the drawings of the original specification, and it was proper to describe it in the re-issue.

The defendant's machine has an eye-pointed needle. It has a device, over which the braid is bent, which is an equivalent for the Bosworth roller; the lower end of it, over which the braid to be sewed is bent, being rounded, and the axis of such lower end being substantially at right angles to the line of movement of the work. The point of the needle, passing in a

straight line through the bend of the material, comes out on the same side of the material as that at which it entered. The feed apparatus is an equivalent for that of Bosworth. The adjustable gauge for the fresh braid is substantially the same as Bosworth's gauge for the upper braid. The guide for the partially-completed work is substantially the same as Bosworth's guide for the lower braid. The additional gauge for the other edge of the fresh braid is like Bosworth's additional gauge for the other edge of the upper braid. The needle-guide and its operation have already been considered. It follows, from these considerations, that the defendant's machine infringes the first three claims of No. 7,985. In so holding, I have not overlooked the changes of from before alluded to, nor the facts that the defendant's machine sews a hat from the center of the crown outwardly to the brim, with the fabric lying right side up on the bed-plate, while the

Bosworth machine sews from the brim inwardly; that in Bosworth only one braid is bent, so that the needle passes through three thicknesses of material, while in the defendant's machine both braids are bent, so that the needle passes through four thicknesses of material; and that there are other formal structural differences. But these differences are aside from the vital operating combinations claimed in the first three claims of No. 7,985.

It is urged with great earnestness, on the part of the defendant, that in the original specification the only guide shown or described is a vibrating guide, so constructed as to be forced to continuously vibrate whenever the machine is operated. This is an error. The original specification describes the guide, first, as a fixed guide, added to force the needle to pierce in the desired line, and to be used when every stitch is to pierce the upper braid. The second claim of the original embodies such a guide, fixed and

non-vibrating. Then the original specification goes on to describe a contrivance, the polygonal plate, to be added so as to make some of the stitches in the lower braid only. This is the vibrating needleguide.

The novelty of the first three claims of No. 7,985 is not successfully attacked. Bosworth's bending device and his two gauges for the fresh braid were new devices. Therefore, the three claims are valid, as the bending device is an element in each. Besides that, neither the Rodgers, nor the Morey, nor the David patent contains any provision to prevent the glancing of the needle from a rounded surface.

There is nothing in the Sherwood patent, or in any testimony as to what Sherwood did, to invalidate either of the first three claims of No. 7,985, or to show that what the defendant has used in infringement of those claims existed before Bosworth's invention. The reasons for this conclusion are well and fully set forth in the testimony of Mr. E. S. Renwick, the plaintiff's expert, and it is unnecessary here to state them.

The evidence shows that Bosworth was the first person who made a machine containing devices which operated successfully to make the sewing of straw braid in the making of hats ¹⁹² and like articles otherwise than by hand a practical art, and the re-issued patent No. 7,985 is valid.

There must be a decree for the plaintiff, for an account of profits and an ascertainment of damages, with costs.

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