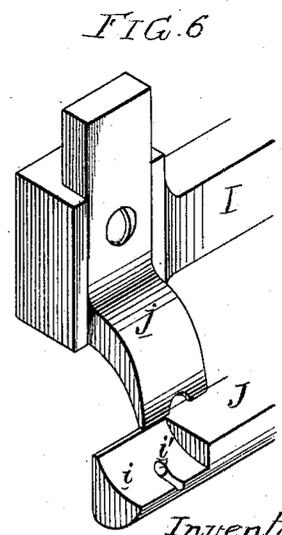
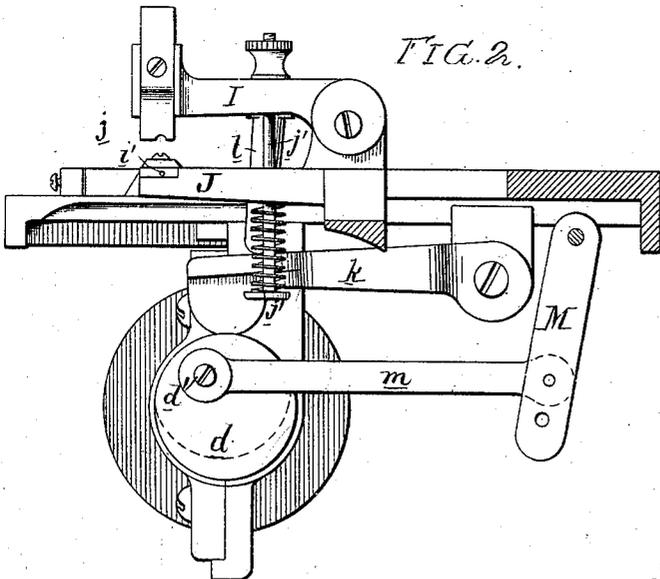
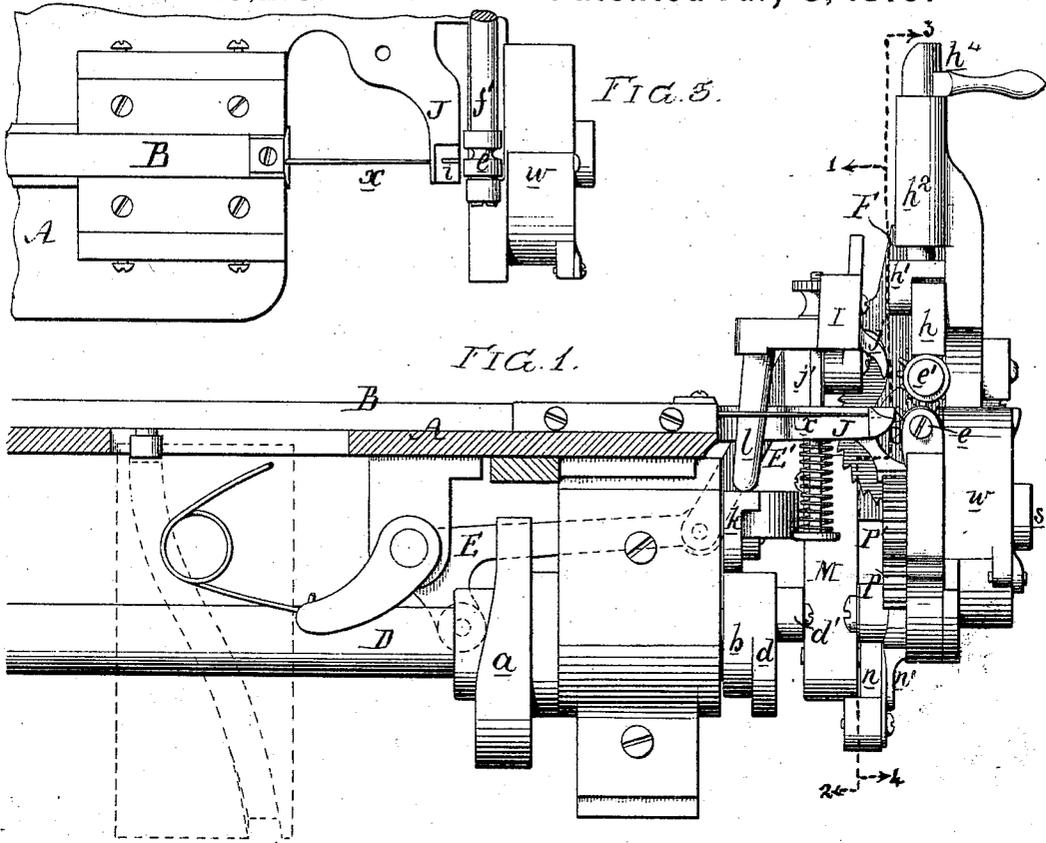


S. HENSHALL.

Machine for Sewing Straw-Braid.

No. 217,216.

Patented July 8, 1879.



Witnesses  
 Henry Howson Jr.  
 Harry A. Crawford

Inventor:  
 Samuel Henshall  
 by his attorneys  
 Horton and Co.

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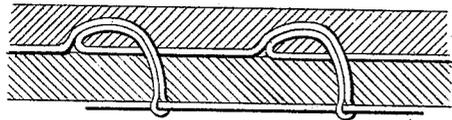


FIG. 10.

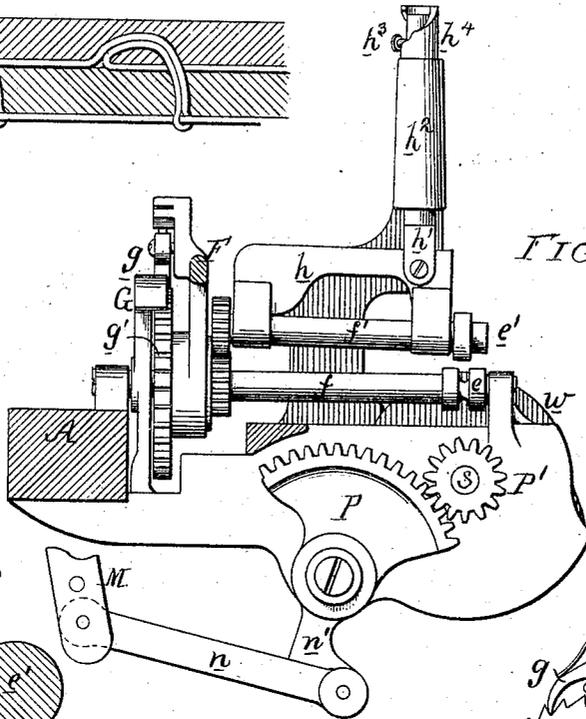


FIG. 4.

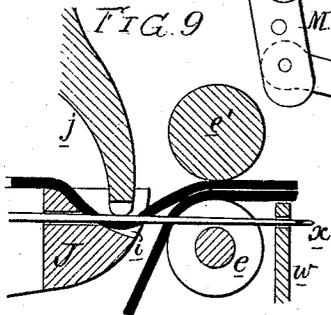


FIG. 9.

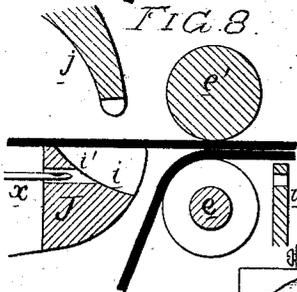


FIG. 8.

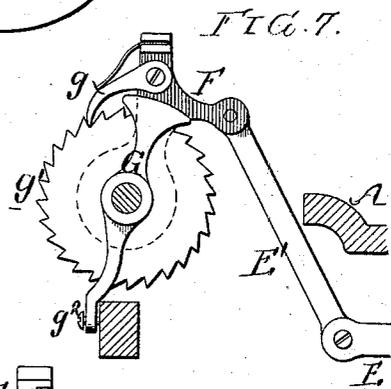


FIG. 7.

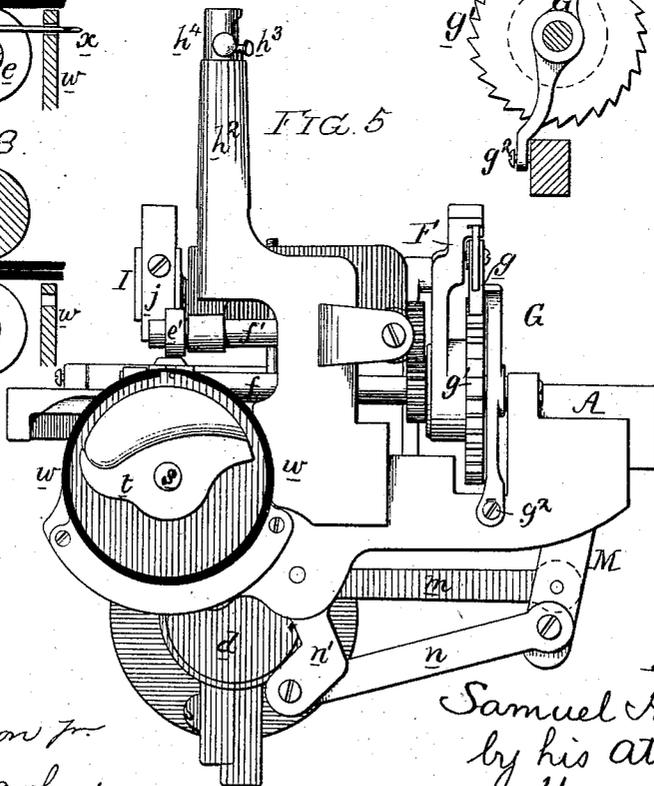


FIG. 5.

Witnesses,  
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Inventor,  
Samuel Henshall  
by his Attorney  
Houben and Son

# UNITED STATES PATENT OFFICE.

SAMUEL HENSHALL, OF PHILADELPHIA, PENNSYLVANIA.

## IMPROVEMENT IN MACHINES FOR SEWING STRAW BRAID.

Specification forming part of Letters Patent No. 217,216, dated July 8, 1879; application filed August 19, 1878.

*To all whom it may concern:*

Be it known that I, SAMUEL HENSHALL, of Philadelphia, Pennsylvania, have invented a new and useful Improvement in Sewing-Machines for Straw Braid, &c., of which the following is a specification.

My invention relates to certain improvements in machines for sewing straw braid or tape for the manufacture of hats and bonnets; and the main object of my improvements is to so construct a shuttle-machine of this class that the hat can be sewed right-side out, thereby overcoming the necessity of turning the hat after the sewing is completed. This object I attain in the manner which I will now proceed to describe, reference being had to the accompanying drawings, in which—

Figure 1, Sheet 1, is a front view, partly in section, of my improved sewing-machine; Fig. 2, a section on the line 1 2, Fig. 1; Fig. 3, a plan view of part of the machine; Fig. 4, Sheet 2, a section on the line 3 4, Fig. 1; Fig. 5, an end view, partly in section; Fig. 6, Sheet 1, and Figs. 7, 8, and 9, Sheet 2, detached views of parts of the machine; and Fig. 10, a diagram showing the formation of the stitch.

A is the bed or table of the machine, to beveled guides on the top of which is adapted the needle-bar B, the edges of the latter being beveled to accord with the guides.

On the under side of the table are bearings for the driving-shaft D, which, in addition to the usual slotted cam for operating the needle-bar, (see dotted lines,) carries two cams, *a* and *b*, and a disk, *d*, from which projects a crank-pin, *d'*.

The cam *a* acts on an anti-friction roller carried by the short arm of a bell-crank lever, E, which is hung to a bearing beneath the table, the long arm of the lever being connected by a rod, E', to an arm on a swinging frame, F, hung loosely to the shaft *f* of the lower feed-roll, *e*, which is adapted to fixed bearings on the bed of the machine. The frame F carries a spring-pawl, *g*, which acts upon the teeth of a ratchet-wheel, *g'*, secured to the shaft *f*, the point at which the pawl in its movement commences to act upon the teeth being determined by the upper end of a lever, G, hung to the shaft *f*, and having at the

lower end an adjusting-screw, *g*<sup>2</sup>. (See Figs. 4, 5, and 7.)

By manipulating this screw so as to throw the upper end of the lever forward or backward, the pawl *g* will be held clear of the teeth of the ratchet *g'* until more or less of the movement of the swinging frame F is completed. Thus the extent of rotation of the lower feed-roll, and consequently the length of stitch, can be readily regulated. (Fig. 7.)

The shaft *f* of the lower feed-roll, *e*, is geared near its rear end to the shaft *f'* of the upper feed-roll, *e'*, the latter shaft being adapted to bearings in a frame, *h*, pivoted to the swiveled lower end of a vertical stem, *h'*, which is arranged to slide in the tubular upper end of a standard, *h*<sup>2</sup>, projecting upward from the bed of the machine, the elevation or depression of the stem *h'* being effected by a handled collar, *h*<sup>4</sup>, acting on a pin, *h*<sup>3</sup>, which projects from the upper end of said stem, and is adapted to a cam-slot in the said collar.

It should be understood that this standard *h*<sup>2</sup> contains a spring which acts on the stem *h'*, so as to impart to the same the desired yielding pressure.

Secured to or forming part of the bed of the machine, and projecting in line laterally with the feed-rolls, and in close proximity to the lower roll, *e*, is a rigid arm, J, in the top of which, at the outer end, is formed a curved recess, *i*, a horizontal opening, *i'*, being also formed near the end of the arm, in line with the needle *x*, for which it serves as a guide, the point of the needle remaining within the opening when the needle-bar has reached the limit of its rearward movement. (Figs. 8 and 9.)

Hung to a bearing above the table A is an arm, I, which carries at the outer end an adjustable finger, *j*, notched at the lower end and adapted to the recess *i* of the arm J. The arm I has a rod, *j'*, acted upon by a spring, the tendency of which is to depress the arm and keep the end of the finger *j* pressed firmly against the base of the recess *i*, Fig. 9.

The arm I is raised at intervals by means of the cam *b*, acting through the medium of a pivoted arm, *k*, and a stud, *l*, the parts being so arranged that such elevation of the arm I occurs during the feeding movement of the rolls *e e'*.

A connecting-rod, *m*, extends from the crank-pin *d'* of the disk *d* to an arm, *M*, pivoted to a bearing in the under side of the table, near the rear edge of the same, and another connecting-rod, *n*, extends from this arm *M* to an arm, *n'*, on a toothed segment, *P*, which is pivoted to the downwardly-projecting flange of the end of the table and gears into a pinion, *P'*, on the shaft *s* of a shuttle-carrier, *t*, the latter being adapted to a shuttle-race contained within the circular casing *w*, which is secured to or forms part of the end frame of the machine. (Figs. 1, 4, and 5.)

The operation of the machine will be best understood on reference to Figs. 8 and 9.

When the machine is ready to start, the parts are in the position shown in Fig. 8, the layer of braid coming up from a roll beneath the machine and resting on the feed-roll *e*, while the sewed tip is clamped between the layer of braid and the upper feed-roll, and rests upon the end of the projecting arm *J*, into the recess *i* of which it is bent by the finger *j* of the arm *I*.

The point of the needle *x* moves forward through the bent portion of the tip, through the layer of braid and the groove of the lower feed-roll, and enters the shuttle-race, as shown in Fig. 9, where its thread is interlocked with that of the shuttle. (See, also, Fig. 5.)

The needle is then withdrawn to the position shown in Fig. 8, and the arm *I* is raised, as shown in Fig. 1, so that the finger *j* releases the tip, which is then free to be fed forward by the feed-rolls to the extent of the length of another stitch. After this feeding operation the finger *j* descends, bends the tip, and the operation is repeated, as before.

As soon as the top of the crown of the hat has been completed said top is bent down over the casing *w* of the shuttle-race, and the formation of the side of the crown at right angles to the top proceeds; and as soon as the latter has been finished the crown of the hat is raised, so as to form the brim at a right angle to the side of the crown.

The use of a vibrating or rotating shuttle and shuttle-carrier is an important feature of my invention, as the shuttle-race demanded thereby is of very limited dimensions, and does not present any obstacle to the turning down of the top of the crown in order to form its side.

As the long stitches are always formed on the under side of the braid when the latter is being sewed, it follows that in my improved

machine the said long stitches are on the inside of the hat as the latter is delivered by the machine—in other words, the hat is right-side out when the sewing is completed. By this means I overcome a serious objection to which straw-braid sewing-machines with reciprocating shuttles are subject, for in all machines of the latter class the bed must be made so large, in order to accommodate the shuttle-race, that it is impossible to turn the completed crown down over the bed, said crown having to be turned up instead of down, so that the hat when completed by the machine is inside out and must be turned before it can be blocked—an operation which has a strong tendency to strain and break the stitches.

Another important feature of the invention is the rigid arm *J*, having a needle-opening, *i'*, and a recess, down onto the base of which the braid is pressed by the finger *j*, for by forming the needle-opening close to the bottom of the recess the stitches may be made as shallow as desired without any risk of the needle failing to puncture the braid. (See Fig. 10.)

I claim as my invention—

1. The combination, in a machine for sewing straw braid or tape, of a longitudinally-reciprocating needle, devices for feeding the braid in line longitudinally with the needle, and a shuttle and a shuttle-casing having its upper edges curved in a plane at right angles, or thereabout, to that in which the braid is fed, as described, so that the mat of braid is free to be bent around the curved edge of the shuttle-casing in forming the crown of a hat, all as set forth.

2. The combination of the reciprocating needle, the feeding devices, the rigid arm *J*, having a recessed end, *i*, and the vertically-reciprocating finger *j*, arranged as described, so as to press the upper layer of braid only down onto the recessed end of the finger, all substantially as and for the purpose set forth.

3. The combination of the feed-shaft *f* and its ratchet-wheel *g'*, the swinging frame *F* and its pawl *g*, devices for operating said frame, and the lever *G*, having an adjusting-screw *g''*, as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

SAMUEL HENSHALL.

Witnesses:

HARRY A. CRAWFORD,  
HARRY SMITH.