

(Model.)

2 Sheets—Sheet 1.

C. H. WILLCOX,  
STRAW HAT SEWING MACHINE.

No. 246,700.

Patented Sept. 6, 1881.

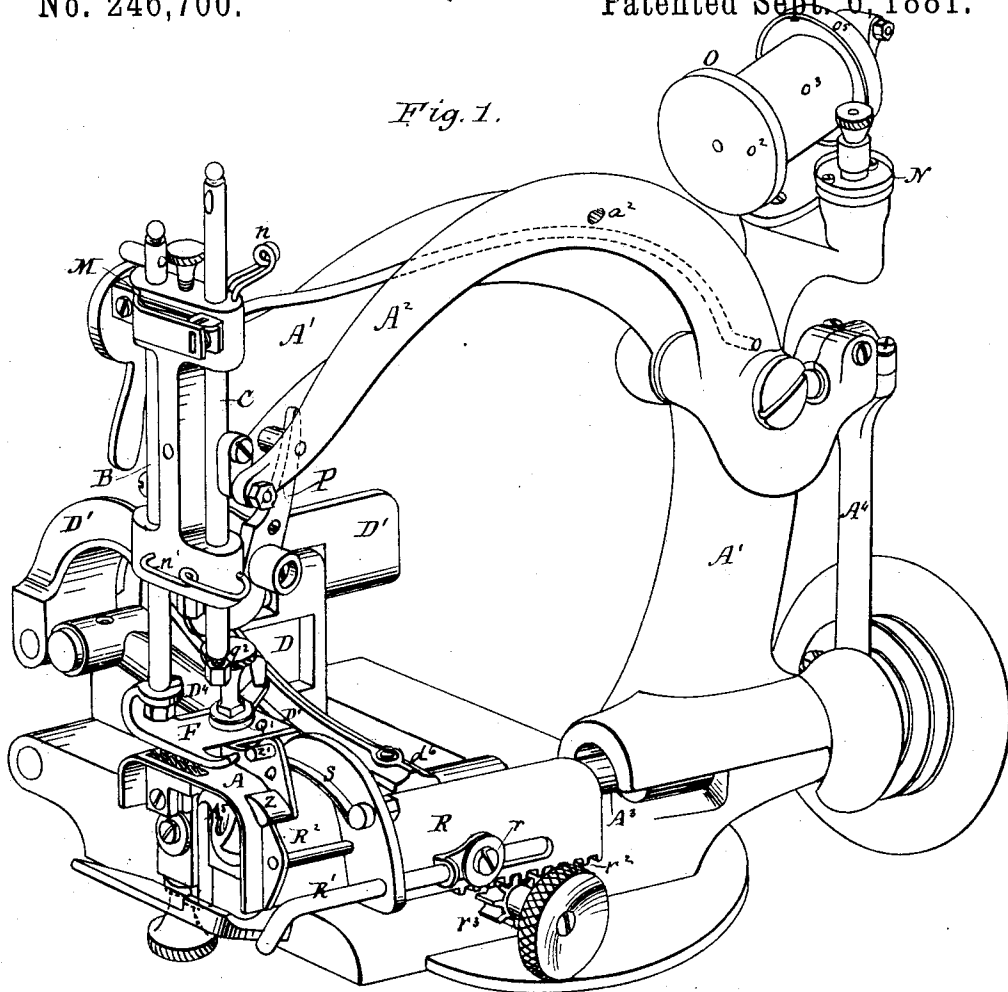


Fig. 1.

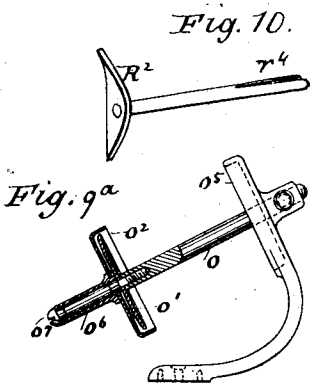


Fig. 10.

Fig. 9a

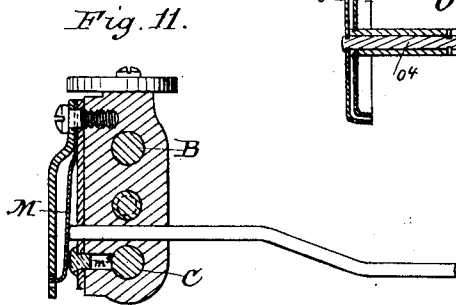


Fig. 11.

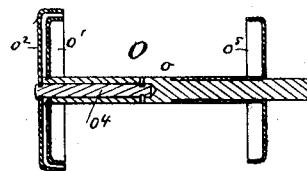


Fig. 9.

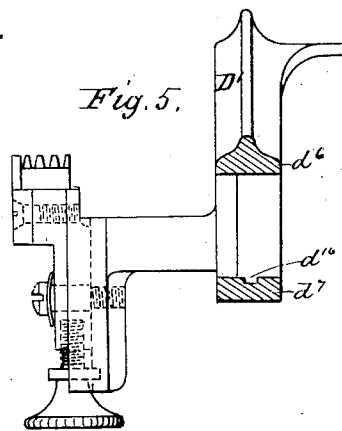
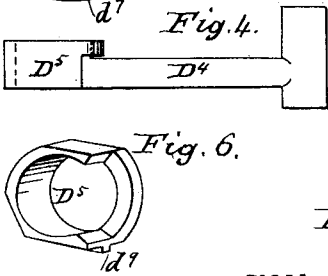
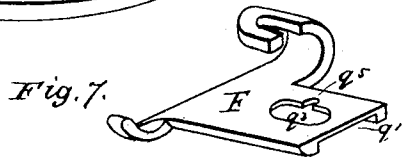
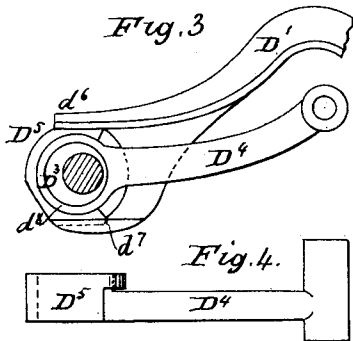
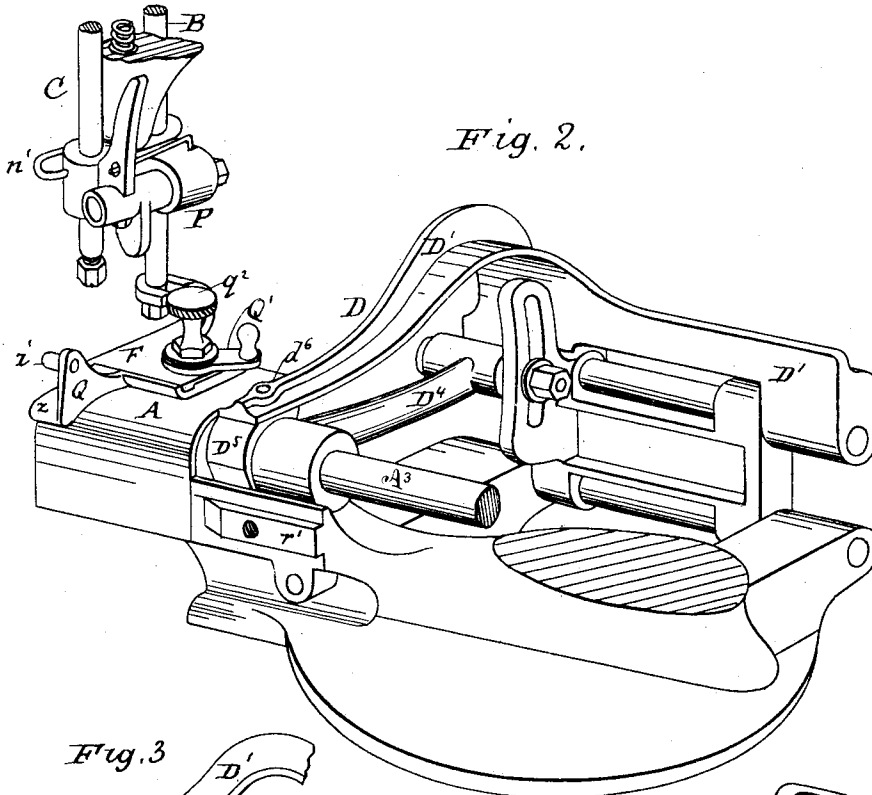
Witnesses  
 E. E. Masson  
 W. E. Bomen,

Inventor:  
 Chas. H. Willcox  
 by A. Pollock  
 his Atty.

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# UNITED STATES PATENT OFFICE.

CHARLES H. WILLCOX, OF NEW YORK, N. Y.

## STRAW-HAT SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 246,700, dated September 6, 1881.

Application filed July 14, 1880. (Model.)

*To all whom it may concern:*

Be it known that I, CHARLES H. WILLCOX, of the city, county, and State of New York, have invented a new and useful Improvement in Straw-Hat Sewing-Machines, which invention is fully set forth in the following specification.

The invention relates to machines for sewing a continuous plait or braid upon itself, so as to form a hat or other article. It comprises improvements in the feed mechanism, in the spool-holder, in the means of attaching a work-guide to the presser-foot and adjusting it thereon, and in the plait-guides and means for adjustment.

I have heretofore devised and patented (by Letters Patent No. 218,413, dated August 12, 1879) a feed-movement capable of general application, but especially adapted for use in straw-braid sewing-machines in which the motions of the feed-surface are obtained in practically right lines from a single eccentric. The motion is communicated to the feed-bar in a horizontal direction through a connecting-rod the head of which encircles the eccentric, and a feed-rocker, to which the feed-bar is hinged and the connecting-rod jointed by an adjustable connection, (the rocker itself being hinged to the machine-frame,) and in a vertical direction directly to the feed-bar, the end of which is forked and embraces the head of the aforesaid connecting-rod. When the inner flat surfaces of the fork and the round head of the connecting-rod move in contact with each other considerable wear is produced, which cannot be readily taken up. The difficulty is overcome by interposing a shoe, circular on the inside to fit the head of the connecting-rod, and flat on top and bottom to give a suitable bearing-surface for the fork of the feed-bar, and this construction forms a part of the present invention.

The spool-holder is of that class in which the thread is drawn from the spool over the edge of a disk to a thread-guide in line with the spool-pin.

Heretofore the disk has commonly been fixed to the spool-pin; but a spool-holder has also been devised with a disk supported loosely on a vertical spool-pin.

The present invention with relation to the spool-holder consists in supporting the disk,

which is made very light, upon an elongated journal or pivot bearing formed with the aid of a sleeve or pin, so that should the thread bind on the edge of the disk the latter will revolve with sufficient freedom to relieve the tension of the thread and prevent its breaking; also, in combining with the spool-pin and a revolving disk a support or bearing for the end of the spool inside of the disk, so that the spool will be kept out of contact with the said disk, and, also, in the combination of the spool-pin, a revolving disk secured to the pin, and means for detachably connecting the latter with its support. The spool-pin preferably employed is inclined, so that the spool rests by gravity against the support or bearing therefor at the end of the spool-pin.

The work-guide is attached to the presser-foot by means of a tongue and groove and a single screw, and is adjusted by means of a device operating as a lever to move the guide nearer to or farther from the path of the needle, and is carried, like the guide, by the presser-foot. The work-guide embodies an edge-guide for the work or partly-finished hat and a separator-plate.

The improvements with relation to the plait-guides consist in a guide for the outer edge of the plait, carried by and adjustable with reference to the inner-edge plait-guide; and in the combination, with the other guides, of a stationary bent pin, which holds down the plait, and acts also as an outer-edge guide for sewing at the usual distance from the edge of the plait or braid.

The adjustment of the work-guide on the presser-foot and of the plait-guide on the machine-frame is effected without loosening and tightening the holding-screw, the guides being retained by friction in any position to which they may be adjusted.

In order that the invention may be fully understood, it will now be explained in connection with the accompanying drawings, which form a part of this specification, and in which the same letters indicate like parts where they occur on all the figures.

Figure 1 is a perspective view of the improved machine for sewing straw-braid so as to form a hat; Fig. 2, a similar view from a different position, and with the upper part of the machine cut away and plait-guides re-

moved; Fig. 3, a view illustrating the relative position of the feed-eccentric, connecting-rod, fork of the feed-bar, and interposed shoe; Fig. 4, a top view of the connecting-rod, with the shoe in position; Fig. 5, a view of a portion of the feed-bar, partly in elevation and partly in section through the fork in the feed-bar; Fig. 6, a perspective view of the shoe detached; Fig. 7, detail views, showing the manner of attaching the work-guide to the presser-foot and of adjusting it in position thereon; Fig. 8, a perspective view of a somewhat modified form of work-guide; Fig. 9, a sectional view of the improved spool-holder; Fig. 9<sup>a</sup>, a side view, partly in section, of a modified form of the same; Fig. 10, a view detached of the small outer-edge plait-guide; and Fig. 11, a sectional view through the head of the machine, showing the construction of the automatic tension used.

A is the cloth or throat plate; A', the stationary arm or goose-neck; A<sup>2</sup>, the needle-lever pivoted to the standard of the goose-neck, and A<sup>3</sup> the main shaft, from which motion is communicated to the needle-lever by means of a connecting-bar, A<sup>4</sup>, and an eccentric on said shaft.

A<sup>5</sup> is a looper for forming a chain-stitch, carried at the outer end of the main shaft B, the presser-foot bar supported in the head of the machine at the outer end of the goose-neck, and C the needle-bar, connected by a link with the needle-lever.

D is the feed mechanism; M, an automatic or intermittent tension device; N, an adjustable washer-tension, and O the spool-holder.

P is a vibrator or automatic presser-foot lifter, capable of being put into and out of action, as required; Q, the work-guide, attached to the presser-foot F; and R R' R<sup>2</sup>, the plait-guides. As the vibrator, tension devices, and most parts of the feed mechanism and their mode of operation, as well as the general features of the machine, are fully set forth in Letters Patent No. 218,413, referred to above, and do not of themselves form a part of this invention, explanation in addition to what is shown in the drawings is not here necessary, and I shall therefore confine the description as closely as may be to the parts constituting the present improvement.

D<sup>5</sup> is a shoe of metal, interposed between the forked arms  $\bar{d}^6$   $\bar{d}^7$  of the feed-bar D<sup>4</sup>, and the head  $\bar{d}^8$  of the connecting-rod D<sup>4</sup>, which encircles the eccentric D<sup>3</sup>. This shoe is of general cylindrical form, with a portion of the periphery cut away at the back, so as to allow free play to the connecting-rod, and it is, moreover, flattened on the top and bottom, and provided on the bottom with a tongue,  $\bar{d}^9$ . A portion in front (to the left in Figs. 3 and 6) is also cut away in order to clear part of the machine-frame. In the arm  $\bar{d}^7$  is a groove,  $\bar{d}^{10}$ , adapted to receive the tongue  $\bar{d}^9$ . The shoe being placed in position over the head of the connecting-rod and the fork of the feed-bar slipped in place, with the tongue  $\bar{d}^9$  in

the groove  $\bar{d}^{10}$ , the shoe is retained in position without other fastening. The shoe gives a proper bearing for the inner surfaces of the fork of the feed-bar and for the outer surface of the head of the connecting-rod, so that the rapid wear of these surfaces is avoided.

The spool-holder O consists of a rod or spool-pin,  $o$ , which, as shown, is secured in an inclined position by a suitable clamp and supporting-bar, and is provided with a stationary disk;  $o'$ , at its lower end, on which disk the spool  $o^3$  rests, and a revolving disk,  $o^2$ , preferably cup-shaped. The spool-pin is removed for placing the spool in position thereon, the disks  $o'$   $o^2$  being, of course, detached with it. Spools of different lengths can, it is obvious, be employed, as in any case the head of the spool is or may be brought in close proximity to the disks. As represented in Fig. 9, the revolving disk is attached to a spindle,  $o^4$ , turning in a recess in the rod  $o$ , and held in position by pins extending into an annular groove in the upper part of said spindle.

In Fig. 9<sup>a</sup> the disk  $o^2$  is fastened by solder or other means to a sleeve,  $o^6$ , and revolves with it. This sleeve is held in position, as is also the disk  $o'$ , by the screw  $o^7$ .

In order to prevent the thread from springing out over the upper end of the spool and falling around the rod  $o$ , an additional cupped disk,  $o^5$ , is employed, which disk may be stationary or capable of revolution. As shown in Fig. 9, it is fastened to a loose sleeve encircling the rod or spool-pin. In Fig. 9<sup>a</sup> it is attached to or formed in one piece with the supporting-bar. In using the spool-holder the spool remains stationary and the thread is drawn off over the edge of the disk  $o^2$ , the latter revolving whenever the tension on the thread becomes sufficient. In this way is obviated the danger of breaking the thread when the spool is nearly exhausted and the thread is bent rather sharply over the edge of the disk. In threading the machine the thread is led from the spool through the eye  $a^2$ , formed, as shown, by a hole in the needle-lever, said eye forming a guide practically in line with the spool-pin or longitudinal axis of the spool.

At  $n'$  is shown a guard formed of bent wire and attached to the head of the machine. Its object is to keep the crown of a hat out of contact with the head of the machine while the brim is being sewed. The thread, before it is led to the eye of the needle, passes through an eye in said guard.

The adjustment of the work-guide Q, which is provided with a tongue,  $q$ , that slides in a groove,  $q'$ , on the under side of the presser-foot F, and is attached to the latter by the set-screw  $q^2$ , is effected by means of the device Q' (see Fig. 7) through the central opening, in the head of which the screw  $q^2$  passes, and which is thus attached to the presser-foot. The screw  $q^2$  passes through a slot,  $q^3$ , in the presser-foot and screws into a threaded opening in the work-guide Q.

On the under side of the device is an ec-

centric pin or projection,  $q^4$ , which fits in a small recess,  $q^3$ , in the side of the slot  $q^2$ . By turning the handle of the adjusting device it acts as a lever, with the pin or projection  $q^4$  as a fulcrum, and moves the guide Q in either direction. A suitable washer is placed between the shoulder on the screw  $q^2$  and the device Q'. After the work-guide is secured in position no loosening of the holding-screw is required for the purpose of adjustment, the friction being sufficient to retain the guide in the position to which it may be adjusted; but said friction is not so great as to prevent the movement of the guide by means of the device Q'.

The separator-plate of the work-guide is indicated by  $z$ .  $z^1$  is a pin used in sewing medium or heavy work, and  $z^2$  a projection used with chip and other thin braid.

The plait-guide R, which guides the inner edge of the plait, is held in position by means of a screw,  $r$ , passing through a slot in the guide and engaging in a screw-threaded opening in the machine-frame, and a tongue,  $r^1$ , which fits in a groove in the guide. Under the head of the screw is a spring-washer. The guide is adjusted by means of a rack,  $r^2$ , attached to or formed in one piece with the guide, and a pinion,  $r^3$ , carried by an arbor supported in a bearing on the machine-frame and provided with a milled head for turning by hand. The adjustment can in this way be readily effected and with great nicety. As in the case of the work-guide, the plait-guide is held in place by friction, and no loosening or tightening is required for the purpose of adjustment. The holding-screw will, of course, be inserted sufficiently to give the necessary amount of friction.

The guide R' is formed by a pin, which passes through a hole in the flange of the guide R, and is retained in position by the same screw,  $r$ . This bent pin is not, however, in itself new, having been already patented to me. Its object is to hold down the entering plate, and also to hold the latter against the guide R when the small guide R<sup>2</sup> is not employed.

R<sup>2</sup> is an adjustable guide for the outer edge of the plait, by means of which the line of stitching may be made closer to or farther from the edge of the plait. It is carried by the guide R, and is, of course, adjustable with it relatively to the stitch-forming devices. In order to embrace plaits of different widths, it is adjustable relatively to the guide R, being held in any position in which it may be placed by the pressure of the split end of the rod  $r^4$  against the sides of the hole in the guide R in which it is placed.

S is a finger, pivoted and attached to the flange of the plait-guide R by a screw and nut. The purpose of the finger is to hold down the inner edge of the plait.

In the foregoing what is considered the best method of carrying out the invention has been described; but it is not intended to confine the invention strictly thereto, since it is obvious that various modifications may be made without departing from the spirit of the invention.

For example, with reference to the spool-holder, the revolving disk can be combined with a vertical or horizontal spool-pin, the thread being drawn off around the edge thereof through a suitable thread-guide substantially in line with the spool-pin or longitudinal axis of the spool. When, in the case of an upright or inclined spool-pin, the thread is drawn over the upper end of the spool, it is not necessary to have a stationary disk at that end, and the revolving disk may be loose on the pin, so as to be capable of an endwise as well as a revolving movement, and the tendency of the thread when it meets with resistance in unwinding to raise the disk will still further relieve the strain.

Having now explained the invention and the manner of carrying it into effect, what I claim is—

1. The combination, in a feed mechanism, with the eccentric, connecting-rod with its head encircling the said eccentric, and feed-bar with its end forked, of a shoe interposed between the head of said rod and the arms of the feed-bar, substantially as described.

2. The shoe described, cylindrical on the interior, with top and bottom flattened on the exterior, and provided with a tongue on one of said flat surfaces.

3. In a spool-holder, the combination, with a spool-pin, of two disks at the outer extremity of said pin, one being stationary and forming a support for the spool, the other capable of being revolved by the thread which is drawn over its edge, substantially as described.

4. The combination, with a presser-foot and work-guide connected therewith by a tongue and groove and set-screw, of an adjusting device, substantially as described.

5. The combination, with an adjustable guide for the inner edge of the plait, of an outer-edge guide carried by said first-named guide and adjustable with reference thereto, substantially as described.

6. The combination, with an adjustable inner-edge plait-guide, of a finger secured thereto and adjustable therewith, and arranged to hold down the edge of the plait, substantially as described.

7. The combination, with a spool-pin, a disk secured to said pin, but capable of revolving, and a support for the spool-pin, of means for detachably connecting said pin with the support, substantially as described.

8. In combination with a spool-pin, a light disk over the edge of which the thread is drawn, having an elongated journal or pivot bearing adapted to keep the same in position and to enable it to turn easily, substantially as described.

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

CHAS. H. WILLCOX.

Witnesses:

J. PARMLY, Jr.,  
J. M. BABCOCK.