

J. BUTCHER

Machine for Sewing Sweat Linings into Hats.

No. 233,657.

Patented Oct. 26, 1880.

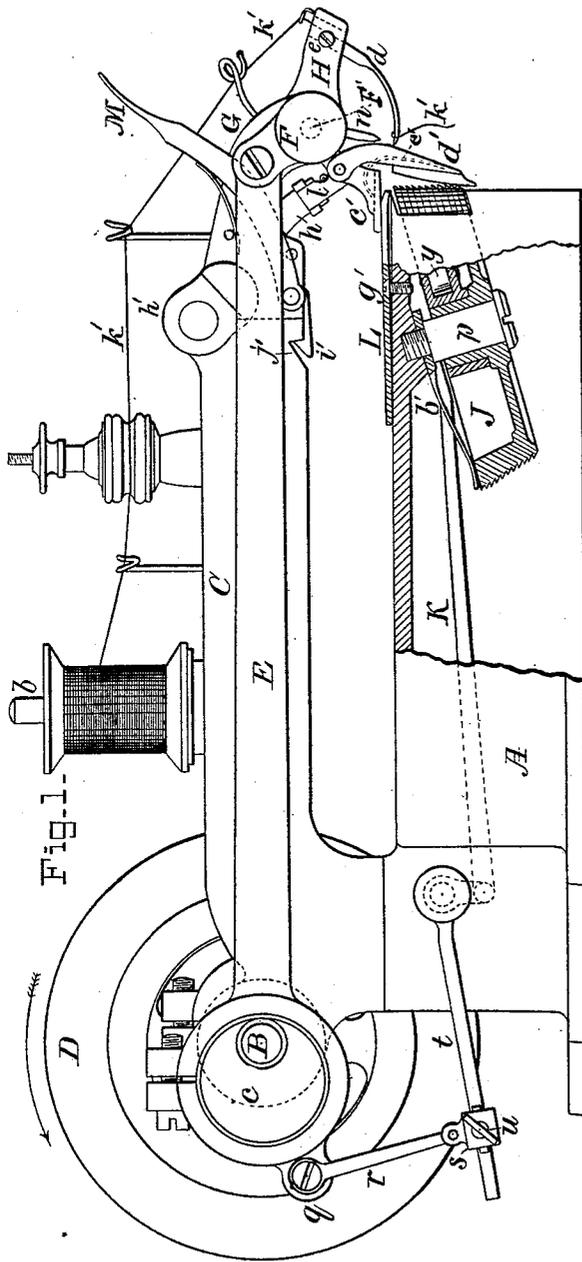


Fig. 1-

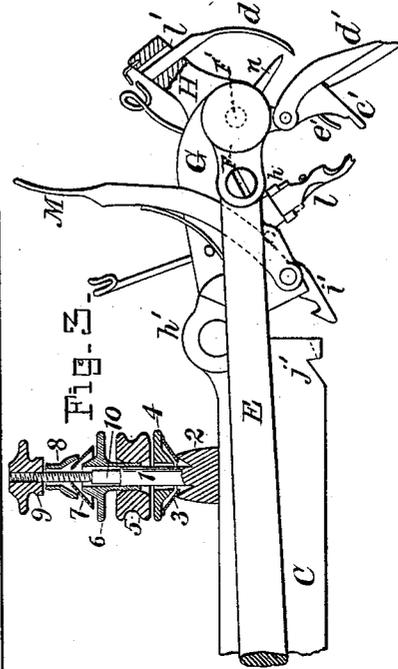


Fig. 2-

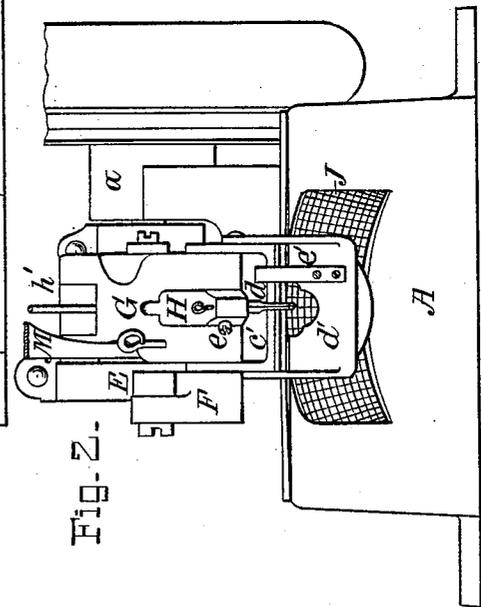


Fig. 3-

ATTEST=

*Julian A. Hurdle.*  
*Edward M. Bray.*

INVENTOR=

*Joseph Butcher*  
*by his attorneys*  
*Burke, Fraser & Consett*

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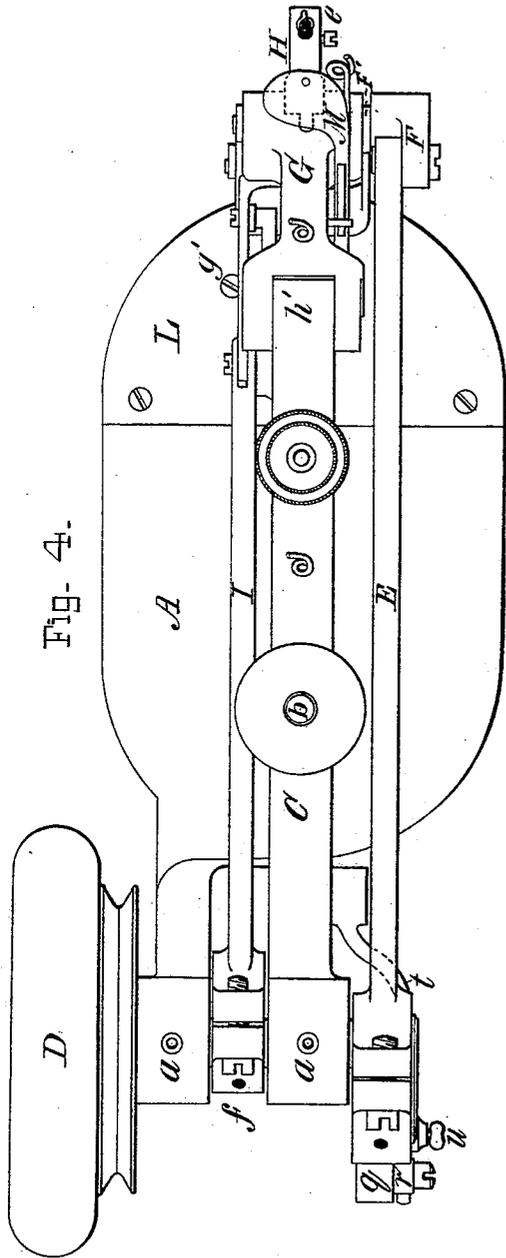


Fig. 4.

Fig. 6.

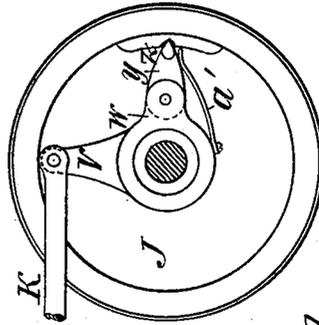


Fig. 7.

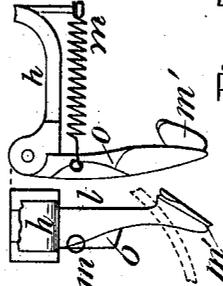


Fig. 8.

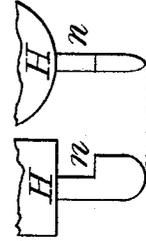


Fig. 5.

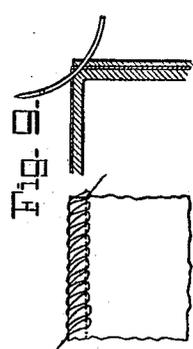
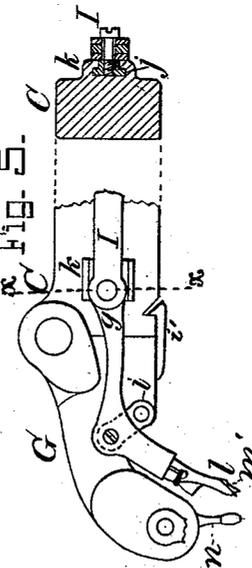


Fig. 9.

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INVENTOR:

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# UNITED STATES PATENT OFFICE.

JOSEPH BUTCHER, OF NEW YORK, N. Y., ASSIGNOR TO THE JOSEPH BUTCHER MANUFACTURING COMPANY, OF SAME PLACE.

## MACHINE FOR SEWING SWEAT-LININGS INTO HATS.

SPECIFICATION forming part of Letters Patent No. 233,657, dated October 26, 1880.

Application filed January 19, 1880.

To all whom it may concern:

Be it known that I, JOSEPH BUTCHER, of the city, county, and State of New York, have invented certain Improvements in Machines for Sewing Sweat-Linings into Hats, of which the following is a specification.

This invention relates most particularly to over-stitch sewing-machines adapted for sewing the sweat-leathers into hats; but some of the novel features are equally well adapted to sewing-machines for other purposes, as for sewing carpets, &c.

The leather bands in hats, known as "sweat-leathers," are generally attached by over-stitching, and the work has usually been done by hand heretofore, although machines have been devised for the purpose.

In the drawings, which serve to illustrate my invention, Figure 1 is a side elevation of the machine, a portion of the hollow base being broken away to show the interior. Fig. 2 is a front elevation of the machine. Fig. 3 is a detached view, showing the head of the machine thrown up. Fig. 4 is a plan of the machine; and Figs. 5, 6, 7, 8, and 9 are detached views, which will be referred to more particularly hereinafter.

A is the hollow base or bed of the machine, on which are mounted the bearings *a a*, for the main driving-shaft B, and the fixed arm C. On the main shaft is fixed the belt and fly-wheel D, and on the arm C are mounted the spool-post *b* and the tension mechanism.

The machine employs but one thread, and the stitch is formed by means of a hook or looper operating in connection with a needle, preferably, but not necessarily, curved.

I will first describe the mechanism required to operate the needle.

On the main shaft B is fixed an eccentric, *e*, which is encircled by a strap attached to a connecting-rod, E. This rod extends forward and takes hold of an arm, F, on a short shaft, F', which extends through the head G of the machine. This shaft bears the needle-arm H, which is mounted between the cheeks of the head. The needle *d* has a straight shank or butt, which fits into a socket in the needle-arm, where it is held by a set-screw, *e*. The body of the needle is bent to a curve corresponding

to, or nearly to, the sweep of the needle-arm, as shown. When the driving-shaft is rotated the eccentric *e* communicates an oscillatory motion to the arm H.

The hook or looper is operated as follows: On the driving-shaft is fixed an eccentric embraced by a strap, *f*, on the extremity of a connecting-rod, I. This rod extends forward and takes hold of an arm, *g*, (see Fig. 5,) which is attached to or forms a part of the hook-bearer *h*. To give it the proper movement in the operation of the machine the arm *g* is hung on the wrist of a crank, *i*, which rotates in the head G; and to prevent the forward end of the rod I from dropping, and thus deranging the movement, it is attached at the point where it is coupled to the arm *g* to a slide, *j*, which plays in suitable guides or keepers, *k*, on the fixed arm C. This construction is best shown in Fig. 5, wherein the sectional view to the right is taken in a plane corresponding to the line *x x* in the main figure. The last-named view is taken from the side of the machine opposite to that shown in Fig. 1.

Referring to Fig. 7, wherein the hook or looper *l* is shown much enlarged and in front and side elevation, it will be seen that the said hook is hinged to the extremity of the carrier *h*, and is arranged to play laterally, being retracted to its normal position by a suitable spring, *m*. When the driving-shaft is rotated the rod I receives a reciprocating motion, which it imparts to the arm *g*; but this arm being controlled in its movement by the crank *i* modifies the movement imparted to the hook or looper *l* and causes it to move in a sweep or curve.

Fig. 8 shows a projection or tappet, *n*, on the needle-arm H, the views being front and side elevations enlarged. In the operation of the machine this tappet strikes the beveled cam-face *o* of the looper and moves it laterally. The purpose of this will be more fully hereinafter explained.

The feeding mechanism is constructed as follows: Referring to Figs. 1 and 8, J is a conical-faced feed-wheel, the roughened periphery of which is arranged to project through an opening in the front of the base A. The feeding or operating surface is arranged in a ver-

tical plane, and the axis  $p$  of the wheel is, in consequence, arranged obliquely.

The mechanism for rotating the feed-wheel is as follows: From the strap around the eccentric  $e$  projects a lug,  $g$ , to which is coupled a link,  $r$ , the lower end of which is coupled to a slide,  $s$ , on an arm,  $t$ . The slide is adjustable on the arm, whereto it is fixed by means of a set-screw,  $u$ . By this device the length of the stitch may be regulated. The arm  $t$  is fixed to an ordinary cross-shaft with bearings in the base  $A$ , on which shaft is a crank, (shown in dotted lines in Fig. 1,) to which is coupled a connecting-rod,  $K$ . This rod extends forward and is coupled to one arm,  $V$ , (see Fig. 6,) of a bell-crank, which turns on the boss of the feed-wheel  $J$ . To the other arm,  $w$ , is coupled a toggle-bar,  $y$ , which takes into a notch or recess in a shoe,  $z$ , which bears against the inner periphery of the feed-wheel. A spring,  $a'$ , serves to keep the shoe pressed lightly against the wheel when it is retracted, and another spring,  $b'$ , (see Fig. 1,) serves to prevent the feed-wheel from turning backward. Reciprocation of the rod  $K$  produces intermittent rotary motion in the feed-wheel  $J$ . The shoe  $z$  is only a convenience, as the tip of the toggle might bear directly upon the feed-wheel. I prefer, however, to employ the shoe.

The arrangement of a conical feed-wheel on an oblique axis gives more room for the attachment of the rotating mechanism, but it is not indispensable.

The presser-foot is arranged to keep the crown of the hat pressed against the feeding-surface and the brim pressed down upon the cloth-plate. It is constructed as follows: The horizontal foot  $c'$  is hung on the cross-shaft  $F'$ , and the vertical foot  $d'$  is hung to the other foot, and the two are kept pressed upon the brim and crown by means of a curved spring,  $e'$ , attached to one of them—in this case to the vertical foot. This spring is so adjusted that when the feet stand at right angles to each other its elastic force is brought into play to press the feet up to the material to be stitched.

The cloth-plate  $L$  is secured to the bed  $A$  at its rear edge, and is arranged to be adjusted vertically at its front edge by means of a screw,  $g'$ , or some other well-known means.

The head  $G$  is hinged to the fixed arm  $C$  at  $h'$ , so that it may be raised up, as shown in Fig. 3. This allows the hat or material to be sewed to be properly placed in position to be operated on. The parts are so arranged, as will be seen by reference to Fig. 3, that the needle is elevated so as to be entirely out of the way by the slight upward movement of the head  $G$ . When down and in position as in Fig. 1, the head is held fast by means of a catch,  $i'$ , arranged to engage a notch at  $j'$  in the fixed arm  $C$ . This catch is operated by means of a thumb-lever,  $M$ , or by some other convenient device. The needle is grooved at

the back, as indicated, and the thread  $k'$  passes down through an opening,  $l'$ , through the needle-arm back of the needle-socket, and upward through the eye of the needle.

Any good tension mechanism may be employed, and I will only briefly describe that herein shown, reference being had to Fig. 3, in which it is best illustrated. The post 1 springs from the base 2, which is mounted on the fixed arm  $C$ . First comes a felt washer, 3, then a disk, 4, then a sheave, 5, of some yielding and elastic material, around which the thread is wrapped, then a disk, 6, then a felt washer, 7, and a flared sleeve, 8, and on this bears an ordinary tension-nut, 9. The sleeve 8 fits a square, 10, on the post 1. The machine is threaded as shown in Fig. 1, the thread  $k'$  passing from the spool around the tension-sheave, and thence through guides to the needle. The head is now lifted and the hat placed in position, the brim resting on the plate  $L$  and the crown against the feed-wheel. The head is now let down, care being taken to have the foot  $c'$  of the presser adjusted properly on the brim, and the other foot,  $d'$ , arranged to press upon the sweat-leather to be stitched in, so as to keep the hat properly up to the feeding-surface. If the plate  $L$  has been properly adjusted previously, and the wheel  $D$  be now turned in the direction of the arrow, the needle will advance and pass through the leather and inner lining of the hat, as indicated in the sectional view, Fig. 9. It is not intended that the needle shall pass through the entire substance of the hat, but diagonally through the salient angle, including the leather and the interior lining only of such hats as have linings.

When the needle advances to enter the leather or goods, the looper is protruded forward and downward to its fullest extent, lying, in fact, quite close up to the sweat-leather. The needle, to enter the goods, must pass over the wing  $m'$  of the looper, (see Fig. 7,) as indicated by the broken curved lines. As the needle continues to advance, the tappet  $n$  on the needle-arm strikes the cam-face  $o$  of the looper and presses the looper to the left until the wing  $m'$  is clear of the needle. The looper now rises until it reaches the end of its stroke, when the needle, which has reached the end of its stroke, begins to return. The tappet  $n$  is also retracted, and, passing the shoulder on the hook or looper formed by the projecting cam-face  $o$ , sets the looper free, and it is drawn back to its original position by its spring  $m$ . In moving to the right, however, in this position, its wing  $m'$  must pass laterally over the needle, and a groove in the edge of the wing engages the loop of thread formed at the back or upper side of the needle by its partial withdrawal. The needle now rapidly withdraws, and is followed by the looper bearing the slightly-expanded loop, which rests in the groove in the edge of the wing  $m'$ . As the needle advances to make the next stitch, (the feed

having advanced the goods in the meantime,) the hook holds the loop of thread so that the needle must pass through it; and when the tappet *n* presses the looper to the left it leaves the loop behind, and is prepared to engage the next.

The moderate amount of slackness in the thread produced in forming the loop is taken up by the movement of the needle-arm, and no other take-up is thought to be necessary.

The stitch produced is shown at the left in Fig. 9. It will be seen that the bight of the thread put through by the needle is brought back over the edge of the goods and laid in position for the needle to pass through it in making the next stitch, thus forming an over-stitch.

In the construction of my machine I wish it understood that I do not confine myself to the precise method of producing the results that I have shown, as in many instances mechanical equivalents may be substituted for the elements described—as, for instance, the ordinary four-motion feed might be substituted for that shown. Such a feed would, perhaps, be preferable for some kinds of overseaming, as in making carpets or in work of a similar character. The feed might also be operated directly from the main shaft.

Instead of arranging the needle to pierce obliquely upward and inward, this movement might be reversed and the needle be arranged to pierce obliquely downward and outward; or, in overseaming carpets and other work of a similar character, the needle may be arranged to pass directly through the goods, and not obliquely. The curving of the needle has little or nothing to do with the operation of the machine. By a suitable connection with the driving-shaft a straight needle might be substituted. For convenience, however, I prefer a curved needle, as shown.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A stitch-forming mechanism consisting of the combination of the needle-arm H, provided with the tappet *n*, mechanism for reciprocating said needle-arm, needle *d*, hinged hook or looper *l*, provided with a cam-face, *o*, and grooved wing *m'*, carrier *h*, spring *m*, connecting-rod I, mechanism for reciprocating said rod, and crank *i*, substantially as set forth.

2. The combination of the fixed arm C, the bed A, to which it is fixed, the head G, hinged to the arm at *h'*, the needle-arm H, mounted in the said head, the arm F, fixed to the needle-arm shaft, the connecting-rod E, the eccentric *c*, and the main shaft B, all arranged substantially as shown, and for the purposes set forth.

3. The presser-foot consisting of the two separately-movable hinged parts *c'* and *d'*, and

the spring *e'*, all combined and arranged substantially as set forth.

4. The combination of the fixed arm C, provided with the notch *j'*, the head G, hinged to the fixed arm at *h'*, the catch *v'*, pivoted in the head G, and arranged to engage the notch *j'* when the head is depressed, and the operative lever M, all arranged to operate substantially as set forth.

5. The combination of the following elements, namely: the main shaft B, the eccentric *c* and its strap, the link *r*, the slide *s*, with its set-screw, the arm *t*, a cross-shaft and crank, a connecting-rod, K, bell-crank *v w*, toggle *y*, spring *a'*, feed-wheel J, spindle or axis *p*, and a spring, *b'*, all arranged to operate substantially as set forth.

6. The combination of the following elements, namely: the connecting-rod I, arranged to be reciprocated by means of an eccentric on the main shaft, the said main shaft and eccentric, the arm *g*, coupled to the connecting-rod and hung on the crank *i*, the said crank *i*, the carrier *h*, the hook or looper *l*, hinged thereto, and the spring *m*, all arranged to operate substantially as set forth.

7. The combination of the connecting-rod I, mechanism for reciprocating said rod, the slide *j*, affixed thereto, the keeper *k*, the arm *g*, crank *i*, carrier *h*, and hook or looper *l*, all arranged to operate substantially as set forth.

8. The combination of the hook or looper *l*, having a cam-face, *o*, and grooved wing *m'*, with the carrier *h*, to which it is hinged, and the spring *m*, the said parts or elements being arranged to operate substantially as set forth.

9. The combination of the following elements, namely: the main shaft B, eccentric *c*, connecting-rod E, arm F, shaft F', needle-arm H, the tappet *n* on said arm, and the needle *d*, the connecting-rod I, the eccentric on the main shaft, for operating said rod, the arm *g*, crank *i*, carrier *h*, hook or looper *l*, and spring *m*, all arranged to operate substantially as set forth.

10. The combination of the following elements, namely: the base A, fixed arm C, head G, hinged thereto at *h'*, the horizontal part *c'* of the presser-foot, hinged loosely to the head G, the vertical part *d'* of the said foot, hinged loosely to the part *c'*, and the spring *e'*, attached to one of said parts, all arranged to operate substantially as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JOSEPH BUTCHER.

Witnesses:

HENRY CONNETT,  
ARTHUR C. FRASER.