

H. BLAND.
Sewing-Machine.

No. 216.016.

Patented June 3, 1879.

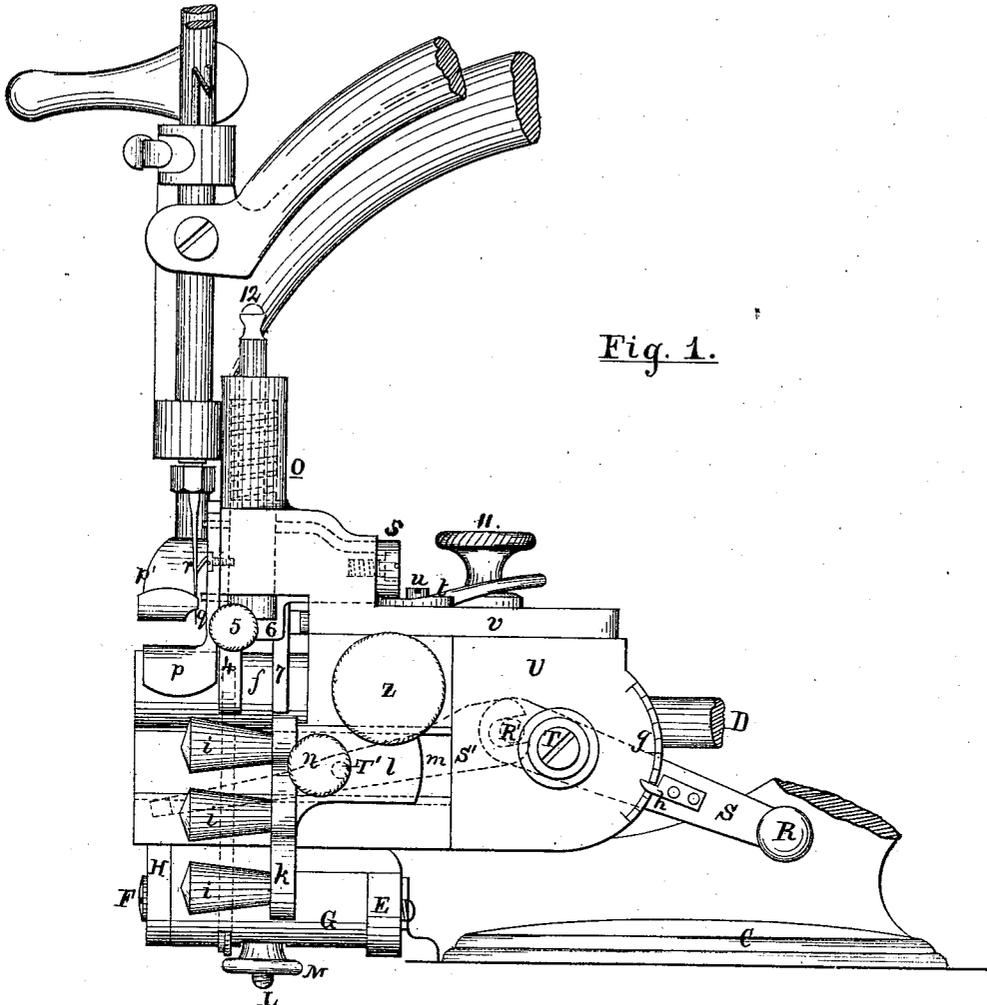


Fig. 1.

Fig. 10.

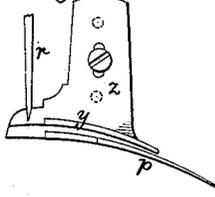


Fig. 9.

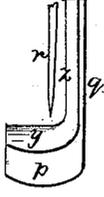


Fig. 11.

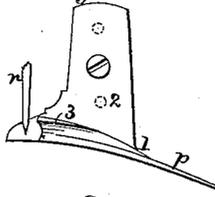
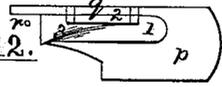


Fig. 12.



Witnesses:

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Henry Bland by
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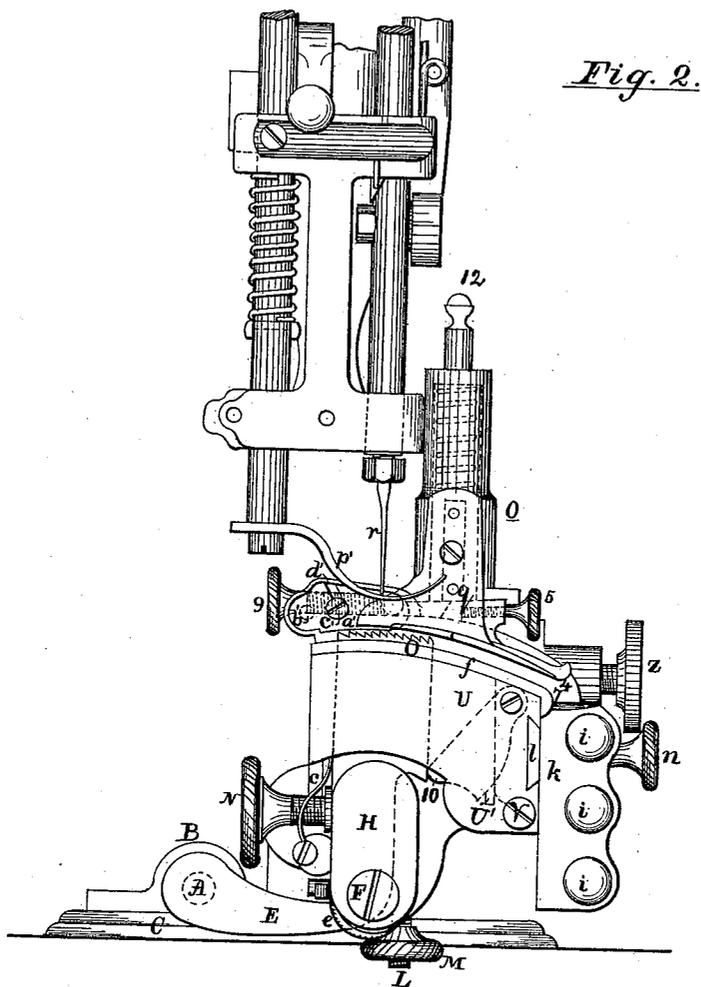


Fig. 2.

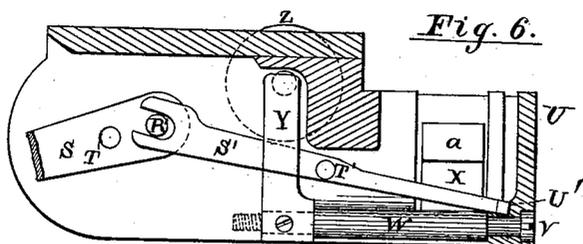


Fig. 6.

Witnesses:

R. A. ...
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Fig. 3.

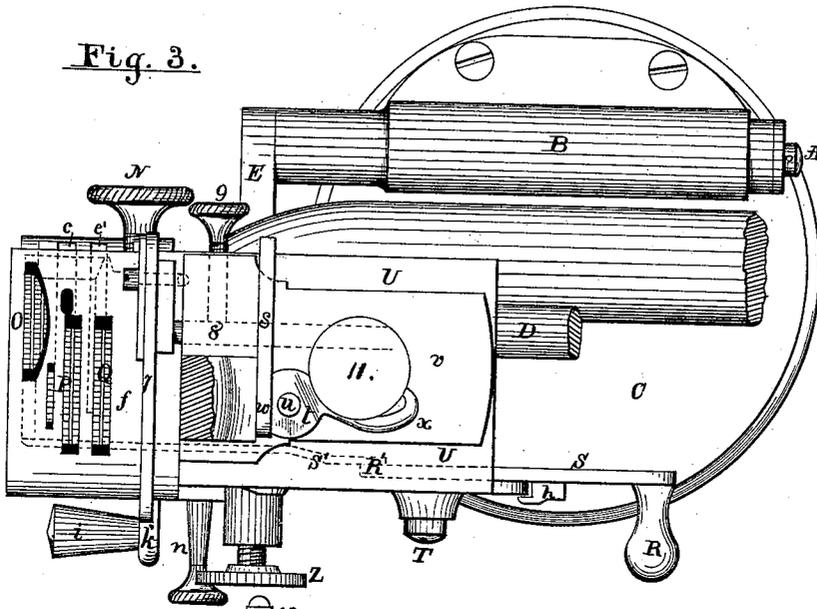


Fig. 7.

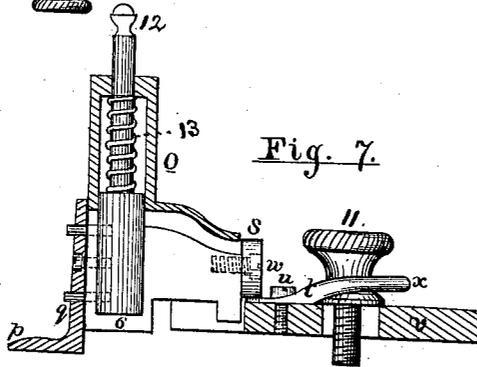
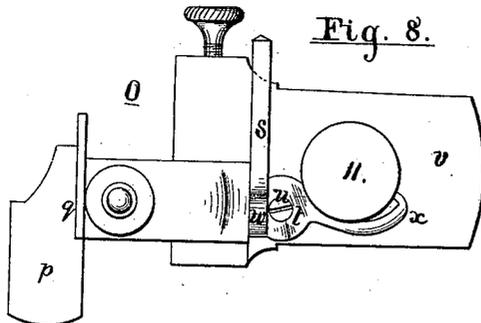


Fig. 8.



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Fig. 4.

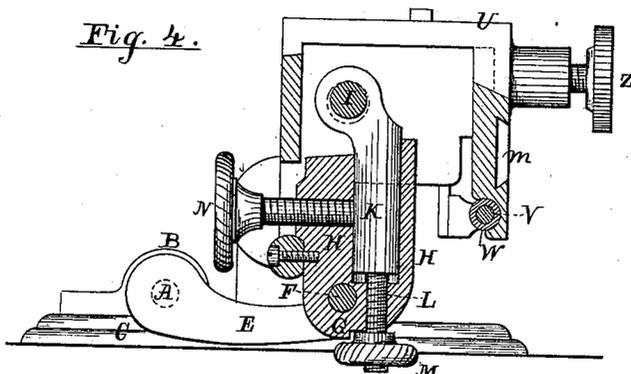


Fig. 5.

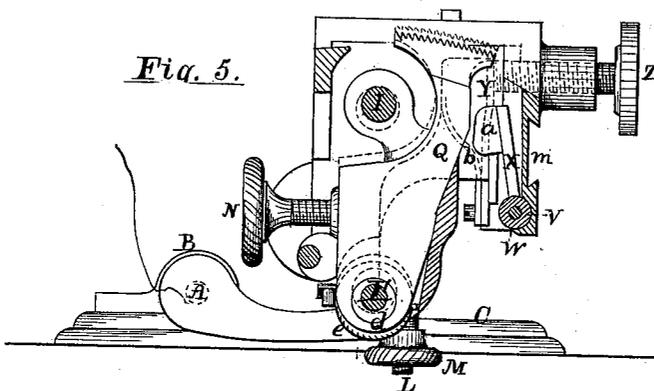


Fig. 13.

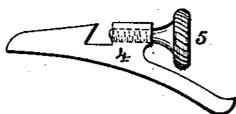


Fig. 14.

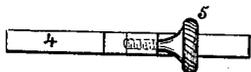


Fig. 15.

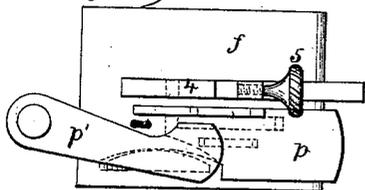


Fig. 16.

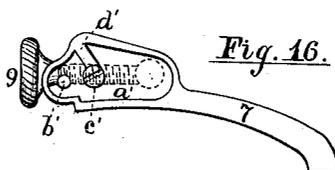
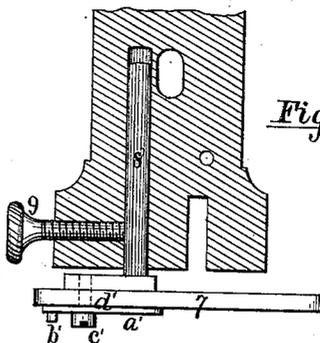


Fig. 17.



Witnesses:

E. Asick
D. P. Lowe

Inventor:

Henry Bland by
A. Pollock his attorney

UNITED STATES PATENT OFFICE.

HENRY BLAND, OF LUTON, COUNTY OF BEDFORD, ENGLAND, ASSIGNOR TO
THE WILLCOX & GIBBS SEWING MACHINE COMPANY, OF NEW YORK,
N. Y.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **216,016**, dated June 3, 1879; application filed
October 19, 1877; patented in England, December 9, 1874.

To all whom it may concern:

Be it known that I, HENRY BLAND, of Luton, in the county of Bedford and Kingdom of England, engineer, have invented Improvements in Sewing-Machines and accessories thereto, of which the following is a specification.

My invention relates more particularly to sewing-machines and their accessories to be used in the manufacture of straw hats, bonnets, or similar articles; but it is also applicable to other purposes for which sewing-machines may be employed; and consists, essentially, of a peculiar arrangement of the feeding apparatus, whereby a high degree of compactness is obtained, and facility is afforded for regulating the difference in the speed of the two surfaces for feeding forward the article and the braid or material which is in the course of being attached thereto, and for obtaining a sufficient traverse without an undue elevation of the feed-surface; also, of an improved presser and guides, which are capable of adjustment to suit the degree of the lap and the width of the materials being sewed.

This arrangement is especially adapted for use in combination with the machine known as the "Willcox & Gibbs sewing-machine," but is also applicable to other descriptions of sewing-machines.

In carrying out my invention I arrange the feed apparatus in the following manner, *videlicet*: To the base-plate of the machine, and in a line with the driving-shaft, I attach a socket-piece carrying a shaft, to which is connected one extremity of a crank-arm, the opposite end of such crank-arm having secured thereto a pin carrying the feed-block. This pin is arranged in the same vertical plane as the driving-shaft, and at a suitable distance below the same, and the feed-block is actuated by means of an eccentric fast on such driving-shaft, the serrated surfaces above the shaft having by means of this arrangement a greater traverse in proportion to their rise than in existing apparatus moved by an eccentric.

The feed-block, which may be rendered capable of adjustment bodily in order to regulate the length of stitch, as in the ordinary

manner, is provided with a fixed feed-surface, and also with another feed-surface, which is adjustable separately and independently of such block.

The fixed feed-surface is employed for feeding the material to be sewed or attached, while the adjustable surface is intended for the feeding of the sewed portion of the article or material, and moves a shorter distance than the block when desired.

This additional or adjustable feed is arranged in the following manner, *videlicet*: In the feed-block there is formed a vertical slot for the reception of a tongue-piece, the lower end of which is hinged or jointed to the crank-pin, while the upper end is serrated, and the back portion of such tongue-piece is formed with an inclined surface, which is acted upon by a lever or other suitable means in order to adjust the position of the tongue-piece, so as to obtain the required traverse, a spring being employed for the purpose of maintaining the tongue-piece in its normal position when not acted on by the lever.

With one of the feed-surfaces I employ the ordinary presser-foot, and with the other my improved arrangement of adjustable presser and guide hereinafter described.

To the plate or arms of the machine I attach, by means of a screw passing through a slot, a socket-piece carrying the presser, the upper part of the foot of which presser forms a guide for one portion of the material, while the lower part of the presser consists of a thin steel plate which separates the two portions of the material in front of the needle. The slot hereinbefore mentioned admits of the position of the guide being regulated to suit the degree of lap of such material. I also employ another shifting-guide for one portion of the material to be sewed, which guide is operated by hand during the progress of the work. This guide is arranged in the following manner, *videlicet*: On the face of the arm or cover I provide a dovetailed groove, within which works a slide actuated by hand. This slide carries a bracket having projecting pins or frustums of cones, through or between which the plait or braid, for example, is folded.

My invention also embraces certain improvements in the presser-feet and their accessories, and which are designed to adapt the latter to the use of my improved arrangement of feeds, the object of such improvement being to enable the feeds to take the inner edge of the plait or braid in all cases.

To the second presser I attach a rigid separating plate and foot combined, the guide for the sewed portion of the material being formed at the extreme back edge of such plate or foot. This presser may be lifted by the means hereinafter described, in combination with which I also employ an additional lever or lifter working horizontally, so as to slightly raise the presser when required.

A similar combined plate and foot is attached, when required, to the before-mentioned presser separating plate and foot, for the purpose of forming the guide for one plait when it is required to sew with three plaits. I also employ a turnover-guide to be attached, when required for use, to the combined presser separating plate and foot, which guide consists of a foot bearing upon one plate, and formed with a scroll or inclined surface which raises the edge of the sewed portion of the plait before it arrives at the needle, thereby allowing the rows of stitches to be placed just beneath the outer edge of such plait, so as to be entirely covered. When the auxiliary feed is brought into use, I employ an auxiliary foot, which is attached to the web or bar of the adjustable presser, so as to form an extension of the combined separating plate and foot.

I further employ an edge-guide for the material immediately behind the needle, such guide consisting of a bar or plate which is carried on a pin fitted in a hole formed in the base of the carrier of the second presser, so as to be capable of adjustment toward or from the needle, and of being fixed by means of a screw in any adjusted position.

To the edge-guide there is pivoted a "keeper," consisting of a plate which bears upon the plait and is adjustable to suit its thickness, so as to maintain the plait in position or prevent its outer edge from rising.

And in order that the said invention may be fully understood, I shall now proceed more particularly to describe the same, and for that purpose shall refer to the several figures on the annexed sheets of drawings, the same letters of reference indicating corresponding parts in all the figures.

Figure 1 of my drawings represents a side elevation of a portion of Willcox & Gibbs' sewing-machine with some of the improvements which form the subject of my invention applied thereto, as an example of one mode of carrying out the invention. Fig. 2 is a front elevation, and Fig. 3 is a plan, both corresponding to Fig. 1. Figs. 4, 5, and 6 are detail views of portions of apparatus. Figs. 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, and 17 are detail views of sewing-machine accessories constructed according to my invention.

Referring to Figs. 1, 2, and 3, A is a rocking shaft fitted to work freely within a long socket or bearing, B, secured to the base-plate C of the machine, and parallel to the driving-shaft D, such shaft A having fixed to its front end one extremity of a vibrating lever-arm, E, which vibrates in a vertical arc, and carries at its opposite extremity a pin, F, working in a bearing or boss, G, formed in one piece with the feed-block H, the length of this bearing imparting great steadiness and stability to the said feed-block as regards lateral play or looseness on said pin.

The center of the pin F, when the lever-arm E is horizontal, or at a half-stroke, is exactly perpendicular to, or in the same vertical plane as, the axial center line of the driving-shaft D above it.

In the head or upper part of the feed-block works the usual feed-actuating crank-pin or eccentric I, which is fitted to, or formed on, the driving-shaft D, as is well understood.

A carrier-pin, K, (see Fig. 4,) is mounted loosely on the eccentric I, and passes through a vertical hole formed in the feed-block H, so that, by varying the position of the feed-block on the pin K, the height of such block may be regulated as required. The carrier-pin K is for this purpose provided with a threaded extremity, L, carrying a nut, M, which bears against the under side of the feed-block H, and by the act of turning which the feed-block may be raised or lowered, as required, after which the feed-block may be secured in any adjusted position by means of the set or tightening screw N, which is fitted in a hole tapped in the feed-block, so as to be capable of bearing against the carrier-pin K.

The feed-block H is provided with three feed-tongues—viz., an outer feed, O, an inner feed, P, and an auxiliary feed, Q—which are pivoted to the pin F, and work in slots or recesses formed for their reception in the feed-block, the tongues O P being pivoted directly to the pin F, whereas the tongue Q is pivoted thereto by the interposition of an eccentric bearing, as hereinafter described.

The outer feed, O, is adjustable separately by the act of turning, by means of the handle R, a lever, S, which is mounted on a fixed center, T, in the casing or cover U, and is provided with a stud, R', engaging with the slotted end of a regulating-lever, S'. This lever is mounted on a fixed center, T', in the casing or cover U, and is provided with a wedged end, U', which operates against a suspended block, 10, acting upon the feed-tongue O, substantially as shown in Fig. 2.

The inner feed, P, and the auxiliary feed, Q, may be arranged so as to be controlled simultaneously or separately, as desired. In my drawings I have represented the arrangement which I employ for controlling the inner and auxiliary feeds simultaneously, reference being had more particularly to the detail sections, front and side elevations, Figs. 5 and 6.

V is a pin supported in the interior of the

casing or cover U, and on which there is mounted a sleeve, W, having two arms or flaps, X Y, the one X of which is arranged opposite to the side of the feed-tongues P and Q, and is made of sufficient width to act upon both tongues simultaneously, while the other arm, Y, is arranged so as to be capable of being moved by an adjusting-screw, Z, passing through the casing or cover U and bearing against the end of the arm Y.

The range of motion of the feed-tongues P Q is varied as required by the act of turning the screw Z. For example, when the screw Z is turned in one direction the arm Y is forced inward, thereby partially rotating the sleeve W, and consequently forcing the padded extremity *a* on the arm X toward the side of the feed-tongues P Q, whereby their range of motion is diminished, while, on the contrary, when the screw Z is turned in the reverse direction, the sleeve W is moved, under the action of a spring, *b*, back to its normal position, or toward the same to the extent allowed by the screw Z, and the range of motion of the tongues P Q is increased, the latter being returned to or toward their normal position by means of other springs, *c c'*, as shown.

Either of the feed-tongues P Q may be so arranged as to be adjusted separately by similar means, if desired. I have illustrated in the detail, Fig. 5, the manner in which the auxiliary feed-tongue Q is fitted to the crank-pin F, the object of the arrangement being to enable the feed-tongue to be elevated when it is to be brought into use, and lowered when not required by the nature of the work. This arrangement consists in fitting the tongue upon an eccentric, *d*, which is loosely mounted upon the pin F, so as to form a bearing for the tongue. The eccentric *d* is provided with a projecting milled rim or periphery, *e*, by the act of turning which with the thumb and finger in either direction the tongue will be raised or lowered.

The dotted lines in Fig. 5 show the raised position, while the full lines indicate the lowest position, as the case may be.

The plate *f* for the material may be either formed with slots for the reception of the whole of the feed-tongues O P Q, as shown in my drawings, or two plates, *f*, may be provided, one having slots for the whole of the tongues, and the other having slots for the tongues O P only, the plates being changed according as the nature of the work shall require, or not, the action of the auxiliary tongue Q.

The devices which I employ for indicating the length of stitch are represented in Figs. 1 and 3 of my drawings. These devices consist of a graduated scale or quadrant, *g*, formed on the side of the casing or cover U, and of a hand or pointer, *h*, attached to the lever S for regulating the throw of the tongue O, which forms the feed for the sewed portion of the material.

It will be obvious that when the lever S is moved, in order to adjust the feed, the hand

or pointer *h* will describe an arc around the quadrant *g*, and that, by suitably graduating the quadrant to indicate the corresponding length of stitch for a given movement of the lever, the feed may be regulated with facility, according to the length of stitch desired.

The inner feeding-surface acts solely upon the plait or binding in the act of being stitched to the body of the work, while the outer feeder operates solely upon the body of the work itself. Facility is thus afforded by simply maneuvering the handle R for feeding the body of the work and the entering straw plait either both at exactly the same rate or for feeding the body of the work either slower or faster than the entering straw plait. This power control or adjustment during the operation of the machine enables all the various shapes of ordinary straw hats to be produced in this machine.

The needle of the sewing-machine and the rotary looper both work between the two feeding-surfaces O and P, so as to insert the stitches, by preference, somewhat nearer to the inner feeder than to the outer feeder. The body of the work is held down upon its outer feeding-surface, O, by the ordinary presser-foot of the machine, while the binding or entering straw plait is held down upon its inner feeding-surface, P, by the improved combined adjustable presser and guide, which I shall now proceed to describe.

Figs. 1, 2, and 3 also illustrate the application of the improved guide for the material to be sewed. This guide consists of frustums of cones *i i i*, fitted at their smaller end to a guide-face, *k*, which is carried on a slide, *l*, the latter being adjustable in a groove, *m*, in the casing or cover U, and capable, when adjusted, of being secured in position by means of a set-screw, *n*.

The braid or other material is conducted round or between the frustums *i i*, as required, according to the particular class of material used or the character of work to be produced.

The object of the cones is to keep the braid as it is fed along in contact with the guide-plate, to which the frustums of the cones or guide-pins are attached, thereby insuring perfect accuracy in the line of feed, it being understood that the feed-line can be adjusted in relation to the stitching-line by shifting and setting the said guide-plate, as before stated.

My improved presser-feet and other accessories are constructed and arranged in the following manner, reference being had more particularly to the several detail views, 7 to 17, inclusive.

Figs. 7 and 8 represent, respectively, a longitudinal section and plan of the adjustable presser for use with the inner feed, P. It consists of a vertical socket-piece, O, provided with a foot-plate, *v*, through a slot in which passes the attaching-screw 11 for connecting the foot-plate *v* to the cloth plate or cover U of the machine. Inside the socket there is fitted a rod or spindle, 12, which is pressed

downward by a helical spring, 13, and carries at its front and lower extremity the presser-plate *p*, which also serves the purpose of a guide to the body of the work, it being adjustable by moving the slot in the foot-plate *v* along its attaching-screw 11, and of a separator, the body of the work resting upon the plate *p*, while its edge bears against the face of the limb *g*, by which the plate *p* is attached to the spindle 12, whereas the entering straw plait is directed underneath the plate *p*, which thus separates the two portions of the material in front of the needle *r*.

A pin, *w*, is fitted into the spindle 12, and projects through a slot in the bottom of the socket, such pin carrying an eccentric cam-lever, *s*, for the purpose of raising the presser-plate *p*, and keeping it elevated when required. In combination with this lifting device I employ the following arrangement: *t* is a disk fitted on a vertical pin, *u*, attached to the foot-plate *v* of the presser, which disk is formed with inclined edges entering beneath the boss *w*, and with it the presser-plate *p* may be slightly raised when required.

When sewing with three plaits—that is to say, two entering plaits and the material already sewed—without bringing into use the auxiliary feed, a similar combined separating plate and foot, *y*, Fig. 9, is attached to the limb *g* of the presser separating plate and foot *p*, so as to partially cover the plate *p*, as shown in the detail front elevation, Fig. 10. The material sewed passes over the top of the plate *y*, the limb *z* of which forms an edge-guide for such material. The intermediate plait is directed between the two plates *y p*, and the other plait passes beneath the plate *p*, the material and the intermediate plait being both acted upon by the outer feed, *O*, while the third plait is acted upon by the inner feed, *P*.

In sewing with two plaits—*videlicet*, the sewed material or work and an entering plait—where it is desired to conceal the rows of stitches produced in attaching the plait to the work, I employ a turnover-guide, (shown in detail front elevation and plan in Figs. 11 and 12, respectively,) which is attached, when required for use, to the limb *g* of the presser separating plate and foot *p*. This guide consist of a foot, 1, carried by a limb, 2, for attachment to the limb *g*, as before mentioned, and which bears upon the last plait but one of the sewed material, and formed with a scroll or inclined surface, 3, which raises the edge of the last plait of the sewed material before it arrives at the needle *r*, so as to allow the stitches to be inserted just beneath the place which the outer edge of such plait occupies in its flat position, so that the row of stitches will be covered when the plait resumes its normal position. The needle thus passes through the entering plait and the last plait sewed, the plaits being of sufficient width to admit of this arrangement.

When in sewing with broad plaits or other-

wise the auxiliary feed, *O*, is brought into use, I employ an auxiliary foot, 4. (Shown in detail side elevation and plan in Figs. 13 and 14, respectively.) This foot is attached by means of a screw, 5, to the web or bar 6 (shown clearly in Fig. 7) of the presser-spindle 12, so as to form an extension of the combined plate and foot *p*.

Fig. 15 is a detail plan of the plate *f*, with the before-mentioned presser-feet *p* 4 and the presser-foot *P'*, corresponding to the feed *O*, shown in position.

Figs. 16 and 17 are, respectively, a detail elevation and sectional plan, showing my improved edge-guide for the entering plait. This guide, which is employed for the purpose of guiding the edge of the plate behind the needle, consists of a bar or plate, 7, which is carried on a pin, 8, fitted in a hole formed in the base *v* of the adjustable presser *o*, so as to be capable of adjustment toward or from the needle, according to the degree of lap required, the pin 8 sliding along the hole formed in the base *v*, and, when adjusted, being fixed by means of the set-screw 9 in the required position. The keeper which I employ for maintaining the plaits in position, so as to prevent its outer edge from rising, consists of a plate, *a'*, pivoted at *b'* to the bar or plate 7, and fixed in place according to the thickness of the material, so as to bear upon the plait, by means of the screw *c'*, a slot, *d'*, being provided in the plate *a'* in order to admit of the required adjustment.

Having now described and particularly ascertained the nature of my said invention and the manner in which the same is or may be used or carried into effect, I would observe in conclusion that what I consider to be novel and original, and therefore claim as the invention, is stated as follows:

1. In sewing-machines of otherwise ordinary or suitable construction, the oscillating feed-block, in combination with and mounted upon a crank or lever carried by a rocking shaft, substantially as and for the purpose herein shown and described.

2. The combination, with the oscillating feed-block mounted upon a crank or lever carried by a rock-shaft, and actuated as set forth, of the two feeding-surfaces, when arranged to operate together, substantially in the manner and for the purpose herein shown and described.

3. The combination, with the feed mechanism, of a lever and a suspended block intermediate between the two, or of an equivalent arrangement for regulating during the working of the machine the throw of the outer feeding-surface independently of the inner feeders, substantially as and for the purposes herein shown and described.

4. The combination, with the adjustable presser, forming also an adjustable guide for one portion of the material to be sewed, of the plate for separating the two portions of such

material, substantially as herein shown and described.

5. The combination, with an oscillating feed-block mounted on a crank arm or lever carried by a rocking shaft, of a carrier-pin arranged to receive the motion of the driving-shaft and support the feed-block, to admit of the height of such block being adjusted as required, substantially as hereinbefore described.

6. The combination, with an oscillating feed-block mounted on a crank arm or lever carried by a rocking shaft, of three feed-tongues, all arranged and operating substantially in the manner and for the purpose hereinbefore described.

7. The combination, with the auxiliary feed-tongue and the crank-pin for carrying the same, of an eccentric sleeve loosely mounted thereon for regulating the height of said tongue, substantially as described.

8. The combination, with the stitch-forming mechanism of a sewing-machine, of an adjustable guide, made up of a series of cones or frustums of cones, arranged as shown, for guiding the material to be sewed, substantially as hereinbefore described.

9. The combination, with the adjustable presser, of a combined rigid separating plate and foot, forming also an adjustable guide for one portion of the material to be sewed, substantially as and for the purposes hereinbefore described.

10. The combination, with the combined separating plate and foot and adjustable presser, of a combined edge-guide and sepa-

rating-plate for a third plait when uniting three plaits, substantially as and for the purpose hereinbefore described.

11. The combination, with the combined separating plate and foot and adjustable presser, of a turnover-guide, constructed and arranged substantially as and for the purpose hereinbefore described.

12. The combination, with the combined separating plate and foot and the adjustable presser, of an auxiliary foot, forming an extension of such plate and foot, substantially as and for the purpose hereinbefore described.

13. The edge-guide for guiding the material to be sewed immediately behind the needle, the same consisting of a bar mounted upon a pin, and adjustably held by means of a set-screw in the base of the adjustable presser, so that its position with regard to the needle may be regulated according to the degree of lap required, substantially as shown and set forth.

14. The combination, with the edge-guide, of the adjustable keeper bearing upon the material to be sewed, substantially as hereinbefore described.

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

HENRY BLAND.

Witnesses:

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