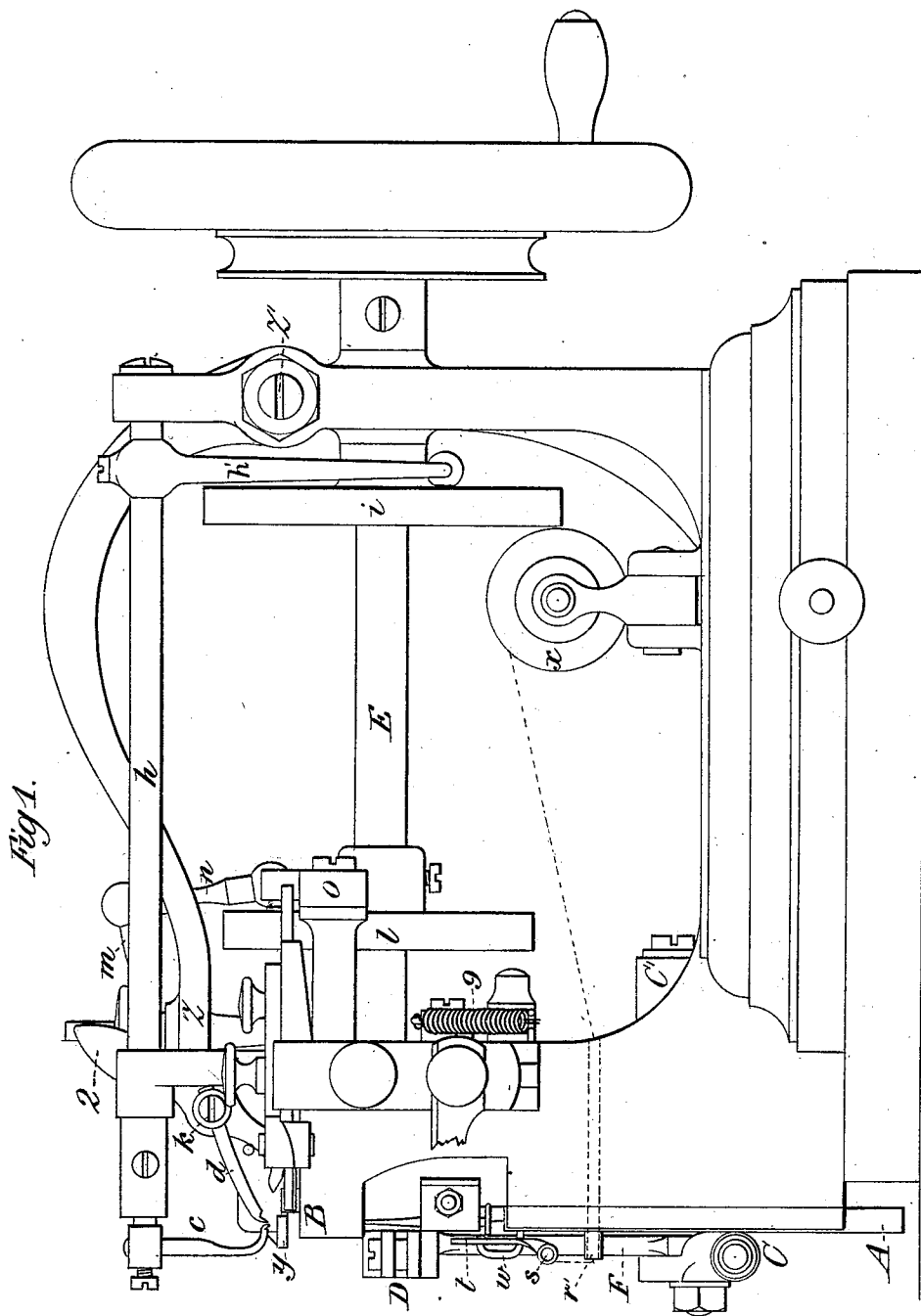


E. WISEMAN.  
Straw-Braid Sewing-Machine.  
No. 228,711. Patented June 8, 1880.



Attest:  
 Courtney A. Cooper  
 William Barton

E. Wiseman  
 By his attorney  
 Charles E. Foster

E. WISEMAN.

Straw-Braid Sewing-Machine.

No. 228,711.

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Fig. 3.

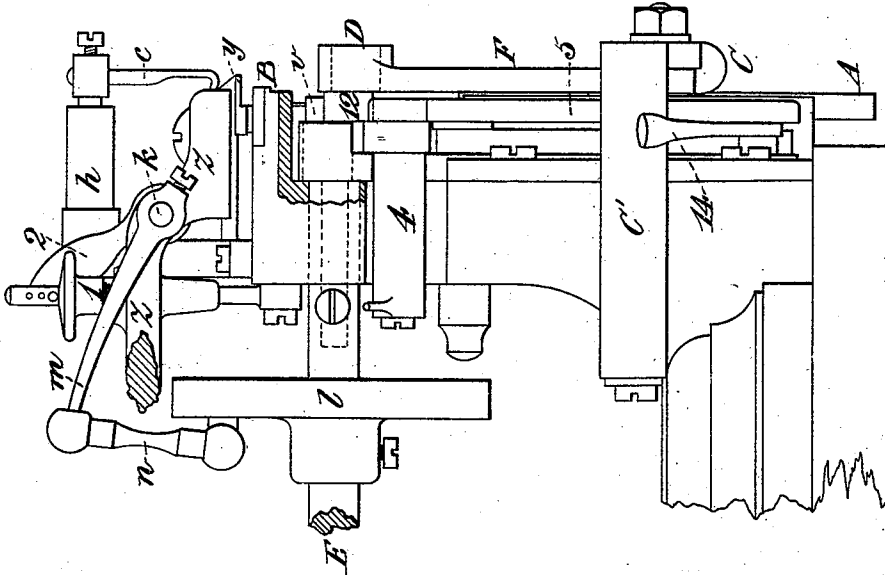
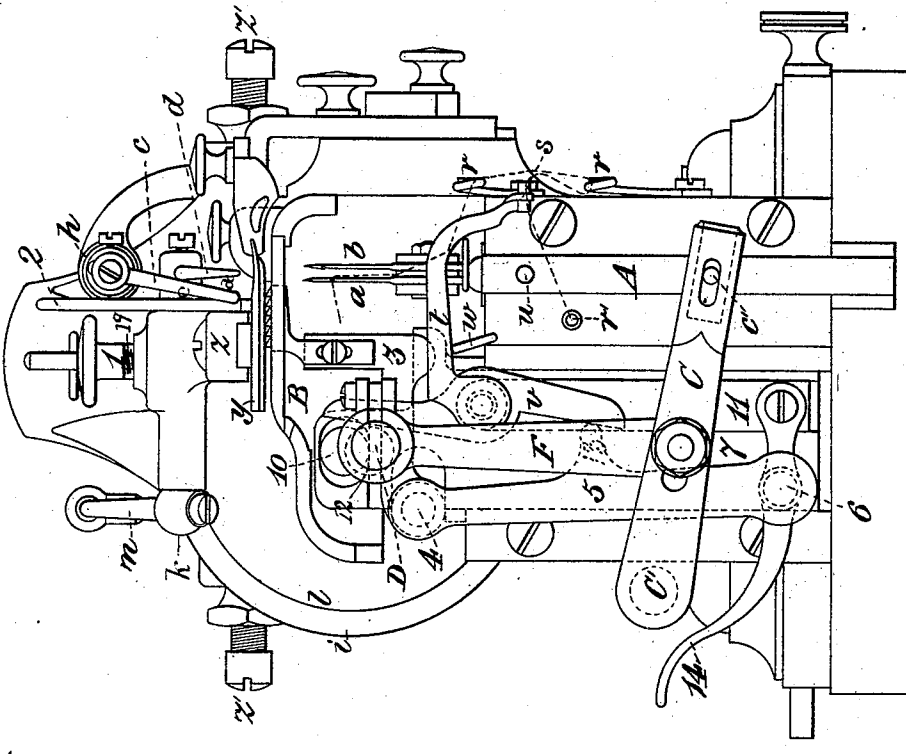


Fig. 2.



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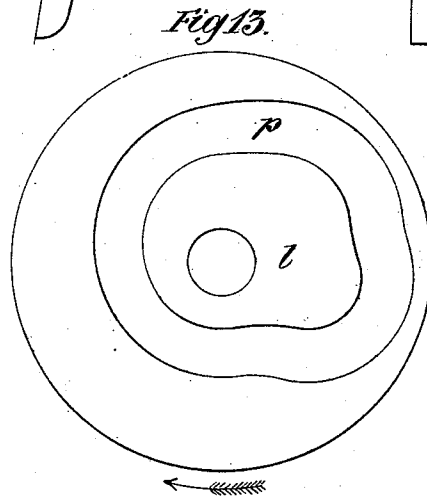
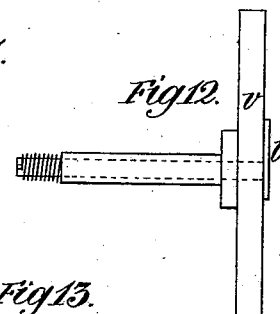
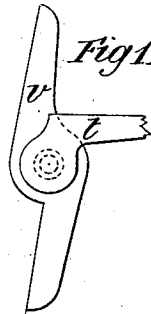
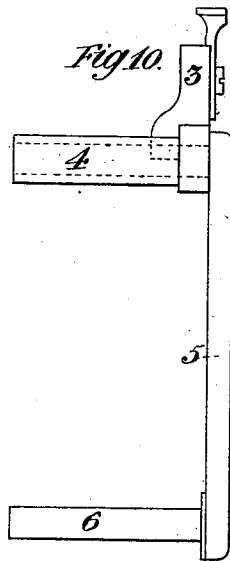
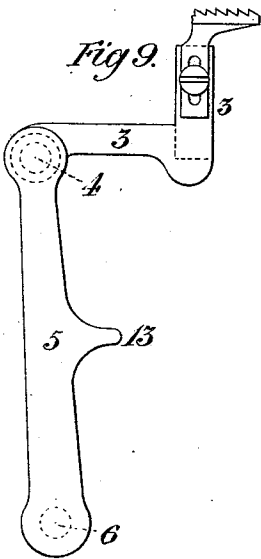
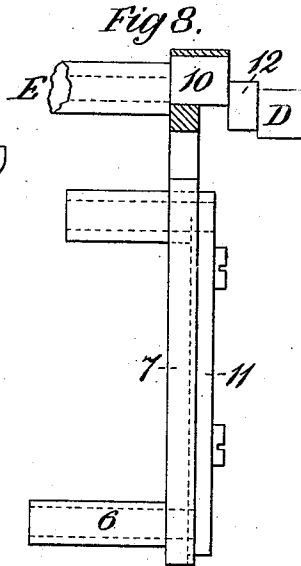
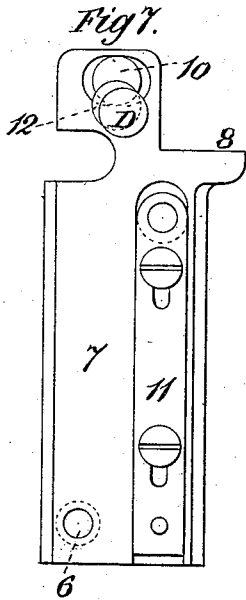
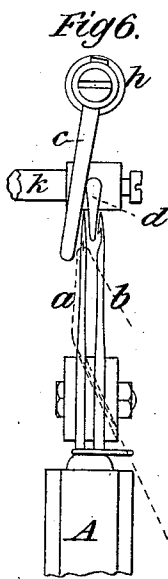
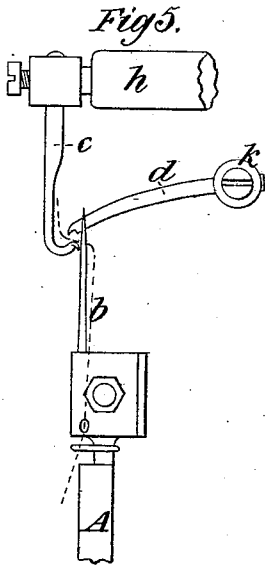
*Courtney A. Cooper*  
*William Bayler*

*E. Wiseman*  
*By his attorney*  
*Charles E. Porter*

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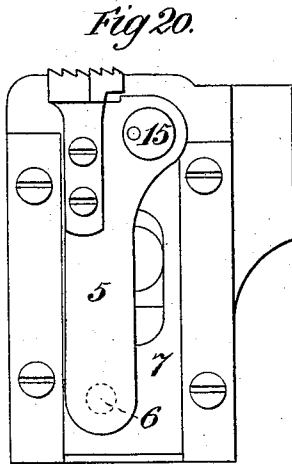
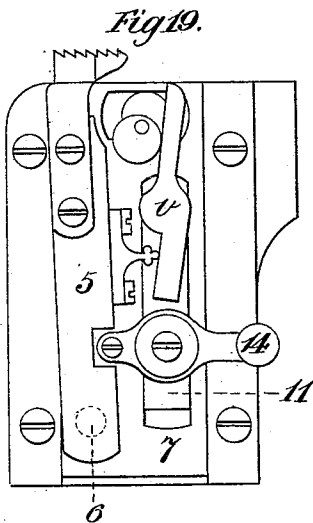
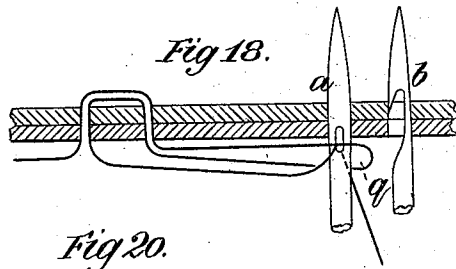
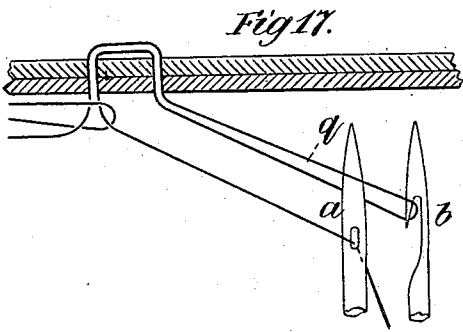
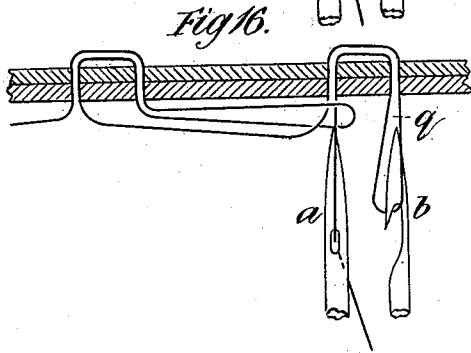
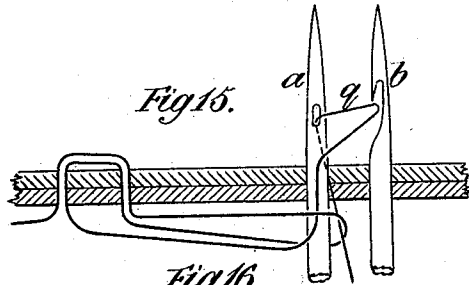
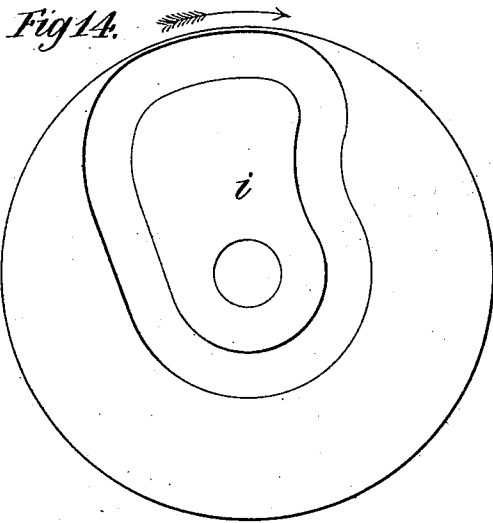
Attest:  
Courtney A. Cooper  
William Taylor.

E. Wiseman  
By his attorney  
Charles S. Foster

E. WISEMAN.  
Straw-Braid Sewing-Machine.

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Attest:  
 Courtney A. Cooper.  
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E. Wiseman  
 By his attorney  
 Charles E. Foster

# UNITED STATES PATENT OFFICE.

EDMUND WISEMAN, OF LUTON, ENGLAND.

## STRAW-BRAID SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 228,711, dated June 8, 1880.

Application filed December 18, 1879. Patented in England June 22, 1878.

*To all whom it may concern :*

Be it known that I, EDMUND WISEMAN, of Luton, in the county of Bedford and Kingdom of England, sewing-machine merchant, have invented Improvements in Straw-Braid Sewing-Machines, of which the following is a specification.

This invention relates to an improved mechanism for sewing by machinery, and to the combination and arrangement of apparatus to be employed therein, and is more especially applicable to what are known as "straw braid or plait machines," employed in the manufacture of straw hats and bonnets and other articles formed by sewing together braids or plaits of straw and other like material, although parts of the said invention are also applicable to other kinds of sewing-machines.

The first part of my invention has reference more particularly to arrangements for producing in a straw-plait sewing-machine the stitch which most closely resembles that of hand-sewing, and which I produce, with a simple combination or arrangement of mechanism or parts, and with great ease to the operator.

The second part of my invention relates to the feed mechanism, chiefly designed for use in straw-plait stitching-machines, although partly applicable to sewing-machines for other kinds of work.

The third part of my invention relates to a peculiar arrangement relative to the feed-regulating devices of an adjustable thread-take-up lever, suitable for straw-plait and other sewing-machines.

In the accompanying drawings, in which similar letters of reference indicate like parts, Figure 1 represents a side elevation of my improved straw-plait machine, looking on the side which immediately faces the operator. Fig. 2 is a front or face view of the same. Fig. 3 is an elevation of a portion of the side of the machine opposite to that shown in Fig. 1. Fig. 4 is a diagram of the stitch produced by my machine. Figs. 5 and 6 are full-sized details in side and front elevation, respectively, of the groups of sewing-instruments and loopers used in the said machine, and which I shall hereinafter more fully describe and refer to. Figs. 7, 8, 9, 10, 11, and 12 are separate details of the feed mechanism. Figs. 13 and 14 are full-sized details of the cams for actuat-

ing the loopers. Figs. 15, 16, 17, and 18 are magnified diagrams, showing the action of the sewing-instruments in the progressive stages of forming the stitch, and Figs. 19 and 20 represent slight modifications of the feed mechanism.

The stitch employed in sewing straw hats and bonnets by hand shows very little thread on the right side of the work, and that only in short stitches, as nearly as possible at regular intervals apart, the greater amount of thread being shown on the wrong or under side of the work.

The stitch produced by my improved arrangement of apparatus, a diagram of which is shown at Fig. 4, is of a single-thread chain-stitch of the character hereinafter described, all of those stitches which are seen on the right side of the work presenting the same appearance—that is to say, short stitches at long intervals.

I do not claim this particular form of stitch separate and apart from my peculiar arrangement for producing the same. This kind of stitch is obtained by my invention with a single motion of the feed, as hereinafter explained, in conjunction with the novel combination and arrangement of sewing-instruments and loopers and the methods of passing the loop, (shown more clearly at Figs. 5 and 6 of my drawings.) In using my machine the plaits are united or stitched together by sewing from the center of the work outward, as is now well understood.

According to my improved arrangement of stitch-producing mechanism, I employ, mounted together side by side upon a needle-bar or slide, A, actuated by a suitable lever in any convenient position, either under the bed or at the side of the machine, a needle, *a*, Figs. 5 and 6, which contains the usual thread-eye near the point, and a hooked instrument, *b*.

For the sake of greater compactness I prefer, in some cases, to actuate the needle slide or carrier A, which slides in vertical guides below the cloth-plate B, by a short vibrating lever-arm, C, working across the front of the feed mechanism upon the fulcrum C'. An eccentric cam or crank-pin, D, Figs. 7 and 8, carried by the driving-shaft E, imparts, through the intervention of a connecting-rod, F, the requisite motion to the needle-actuating lever

C, the free end of which lever is made hollow, or carries a short slide, through which slide and through slots in the end of the lever passes the pin *c'*, which connects the said lever with the needle-slide A. These two sewing-instruments—namely, the needle *a* and the hook *b*, are placed at a distance of about one-eighth of an inch (more or less) from each other, and parallel in a straight line, or thereabout, behind each other in the direction in which the feeder carries the work, and in stitching the said instruments are passed upward vertically, or thereabout, through the plaits to be joined together.

The needle *a* is placed farthest from the operator, and is an ordinary sewing-machine needle, and the hooked instrument *b* is placed nearest the operator, and with its hook directed toward the needle. The needle *a* and hooked instrument *b*, when hereinafter mentioned together, are termed "sewing-instruments."

When the sewing-instruments have been carried upward through the work, the thread-loop of the needle *a*, before again retiring beneath the work, is brought across the path of the hook *b*, which then carries the doubled thread down beneath the work and work-plate, the said loop above the material having been made to pass into the hook of the instrument *b* by the combined action of two loopers, *c* and *d*, having a reciprocating or vibratory motion.

The looper *c* is mounted on the end of a rocking spindle, *h*, which is actuated by the cam *i* (shown in detail; full size, at Fig. 14 in the original drawings) on the driving-shaft E through the medium of an arm, *h'*. This looper takes the loop of thread which is thrown out by the descent of the needle *a*, and draws it forward from the needle toward the hook *b*. The second looper, *d*, then comes into action and moves downward between the two sewing-instruments, and in a direction at right angles to the course of the looper *c*, in order to draw one side of the loop already distended by the looper *c* under the hook of the instrument *b*, so as to insure its being caught during the next descent of the said hook.

The vibrating looper *d* is mounted on a rocking spindle, *k*, which is actuated by the face-cam *l* through the intervention of the lever-arm *m*, connected by a ball-jointed link, *n*, to the lever *o*, which carries a bowl working in the face-groove *p* of the cam *l*, Fig. 13. The thread having been thus brought across the hook *b*, the two instruments *a* and *b* now descend together, and when they have retired beneath the work the feed takes place, such feed being equal to the length of the short stitch and space combined. The hooked instrument *b* retains the loop, which loop is held in such position beneath the work that the needle *a*, on again rising, passes with its thread through the said loop, which is now thrown off from the hook *b* as it passes up through the work.

Figs. 15, 16, 17, and 18 illustrate, on an en-

larged scale, the action of the sewing-instruments and the mode by which the loop is released from the hooked instrument *b* each time it re-enters the material to be sewed. To avoid confusion, wherever one thread crosses another I have shown the hinder thread broken or interrupted.

Fig. 15 is a magnified view of the sewing-instruments when they have just passed up through the work and are about to commence to descend again. The needle *a* has brought a loop, *q*, up through the fabric, which loop is here shown as drawn to one side and across the hook, as it would be by the combined action of the loopers *c* and *d*, in such a position as to insure its being caught by the barb of the hook *b* when it descends.

Fig. 16 shows the sewing-instruments in the act of descending, or before the feed takes place, the hook *b* having drawn the loop *q* with it down through the material.

Fig. 17 shows the position of the loop *q* after the feed has taken place, it being still engaged on the barb of the hook *b* and in a line with the needle *a*. When the sewing-instruments again ascend to enter the material, the needle *a* passes up through the loop *q*, and the material itself pushes off or causes to be released the said loop from the barb of the hook *b*, the loop *q* then remaining round the stem of the needle *a*, as shown in Fig. 18. The sewing-instruments then continue to rise until they regain their original position, (shown in Fig. 15,) when the operations are repeated. By this means a chain-stitch is formed, showing on the right side of the work short stitches of a length equal to the distance between the points of the two sewing-instruments *a* and *b*, and at uniform intervals.

*r r*, Fig. 2, are stationary thread-guides, and *s* is an eye in the end of a spring take-up lever, *t*, lifted by a pin, *u*, in the needle-slide A, and centered on the center of the lever *v*, hereinafter referred to, which serves to regulate the length of stitch according to its height, so that, as the stitch is long or short, more or less thread will be drawn off by the take-up lever. The same object may obviously be obtained by making the pin *u* on the needle-slide, for lifting the take-up lever, adjustable. Moreover the take-up lever *t* may be dispensed with by employing an additional movable guide-eye in the needle-slide itself. *w* is a stop, adjustable or otherwise, for arresting the downward motion of the take-up lever. The thread passes from the bobbin *x* out through a hole, *r'*, in the front part of the casting of the machine, thence through the eye in the end of the take-up lever *t*, through the fixed eyes *r r*, and thence through the head of the needle-holder and eye of the needle *a*.

Any suitable or well-known tension appliance may be used, as, separately, it forms no part of my said invention.

The presser-foot *y* is attached to an overhanging-arm, *z*, which is mounted between fixed centers at *z'*, and if found desirable may be

drawn down at the time the sewing-instruments are entering the work by a special cam acting on a lever connected by a spring to the said arm; but such an arrangement is not absolutely requisite, and is not shown in the drawings.

The pressure of the arm  $z$  may, if desired, be adjusted by the intervention of a helical spring, 19, on a spindle passing through such arm and bearing upon a movable collar or nut, 1, as shown. The lifter-lever 2, for elevating the presser-foot when required, is pivoted to the arm  $z$ .

In my improved feeder, which I prefer to use in combination with the before-mentioned arrangement of sewing-instruments, the propelling motion obtained is horizontal and rectilinear.

3 is the feed-bar, (see Figs. 9 and 10,) which is bent upward to a right angle, or thereabout, and is pivoted at 4 to the upper end of a vibrating vertical lever-arm, 5, working on a fulcrum, 6, at its lower end, carried in the vertical slide 7. The free end of the feed-bar 3 is held down upon a fixed rest or support, 8, forming part of the slide 7, by a spring, 9, which also serves to give the back or return motion.

The vertical motion of the feeder is obtained from the up-and-down motion of the vertical slide 7, derived from an eccentric or cam, 10, working in a slot therein, as shown in the details, Figs. 7 and 8, while the horizontal or to-and-fro motion is obtained from a lever,  $v$ , (hereinbefore referred to and shown in details at Figs. 11 and 12,) the fulcrum of which lever is carried by a vertically-adjustable slide, 11, carried by and working within the first-mentioned slide, 7. This lever is acted upon by a separate cam or eccentric, 12, (see Figs. 7 and 8 and dotted lines, Fig. 2,) and presses against a nose or projection, 13, on the side of the vertical oscillating lever-arm 5. The amount of feed is regulated by raising or lowering the adjustable slide 11, and with it the feed-lever  $v$  and take-up lever  $t$ , by a small stitch-regulating lever, 14, or otherwise.

By a slightly-modified arrangement of the above-described feeder, which is illustrated at Fig. 19, the serrated plate may be fixed directly to the upper end of the upright vibrating lever 5, in lieu of being fixed to a separate jointed feed-bar, 3, as in the previously-described arrangement, the feeding-surface then receiving a curvilinear in lieu of a rectilinear motion. In other respects the arrangement is substantially the same as that last described. Or a single eccentric or cam, 15, on the shaft of the machine may be used, working in a circular opening or bearing in the upper end of the vibrating lever 5 itself, (see Fig. 20,) im-

parting thereto the rising-and-falling as well as the to-and-fro motions, the vertical motion being allowed for by the slide 7, to which the vibrating lever 5 is pivoted at 6, and thus acts as a connecting-link.

I use, by preference, in combination with any of the hereinbefore-described improvements, the guides and presser-feet set forth in the specification of my English Patent No. 3,267, A. D. 1877.

Although, as regards the loopers, I have described and illustrated two separate loopers,  $c$  and  $d$ , working independently in directions at right angles to each other, or thereabout, it is obvious that the same result might be obtained by the employment of a single looper having a compound motion, which draws the loop of needle-thread toward and under the hook of the instrument  $b$ .

What I claim is—

1. The combination, in a sewing-machine, with a needle bar or slide and mechanism for reciprocating the same beneath the work, of a needle,  $a$ , and a hooked instrument,  $b$ , both of which are mounted parallel with each other on said needle bar or slide, devices for carrying a loop of thread from the needle to the hooked instrument on the upper side of the work, and a feeding mechanism, substantially as described.

2. The combination of the eye-pointed needle  $a$  and hooked instrument  $b$ , arranged parallel with each other, and the loopers  $c$  and  $d$ , for carrying a loop of thread from the needle to the hooked instrument, with a feeding mechanism, devices for supporting and reciprocating said needle and hooked instrument, and mechanism for operating said loopers, substantially as herein specified.

3. The combination, with the slides 7 and 11 and lever  $v$  and their operating mechanism, of the lever 5 and feed-bar 3, constructed and arranged substantially as set forth.

4. The combination, with the slide 7, lever  $v$ , and take-up lever  $t$  and their operating mechanism, of the lever 5, feed-bar 3, adjustable feed-regulating slide 11, adjusting-lever 14, and stop  $w$ , whereby the work is fed and more or less thread is drawn off the reel according to the length of the stitches, substantially as set forth.

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

EDMUND WISEMAN.

Witnesses:

EDWIN P. ALEXANDER,  
14 Southampton Buildings, London.

T. J. RAPSON,  
Clerk to E. P. Alexander, 14 Southampton Buildings, W. C., London.