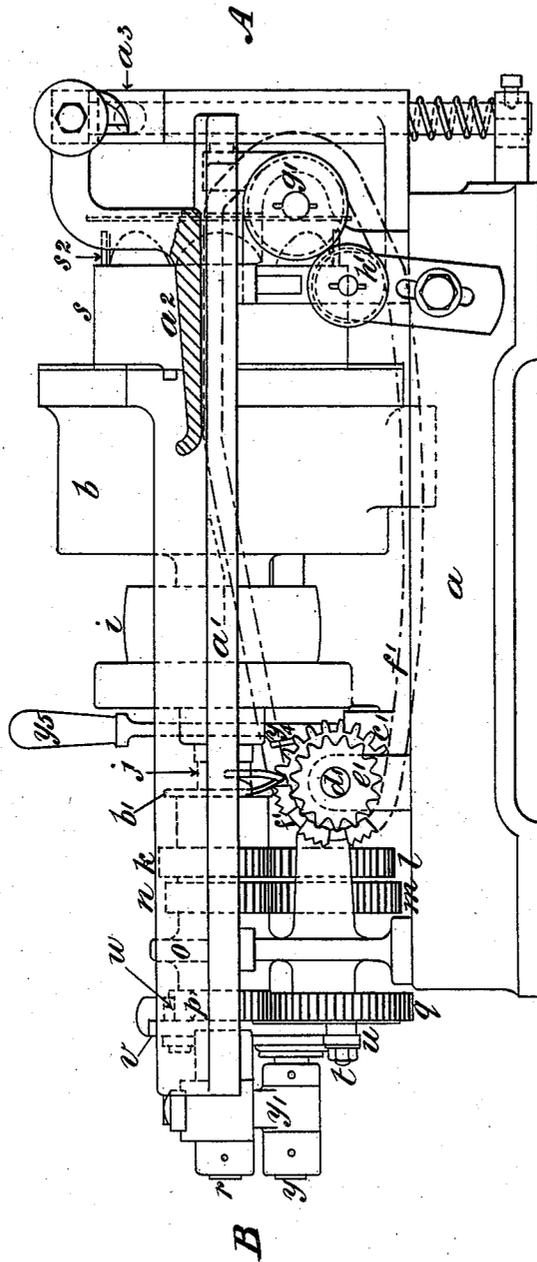


W. WEBSTER.  
OVEREDGE SEWING MACHINE.

No. 402,497.

Patented Apr. 30, 1889.

FIG. 1.



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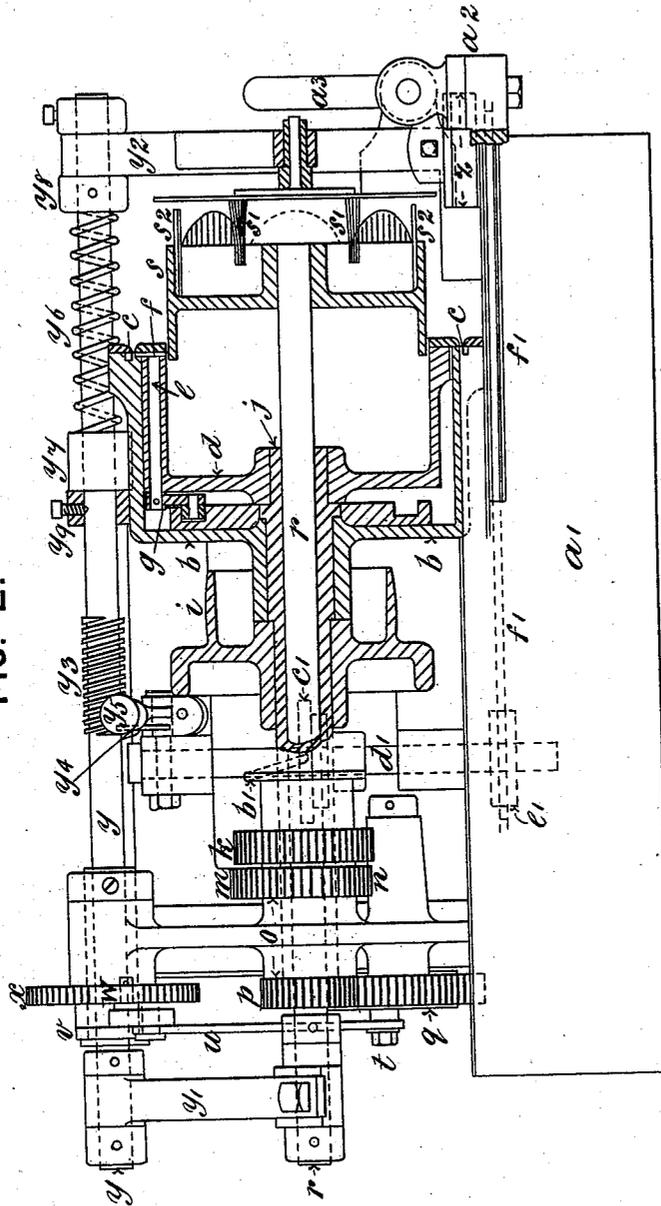
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FIG. 2.



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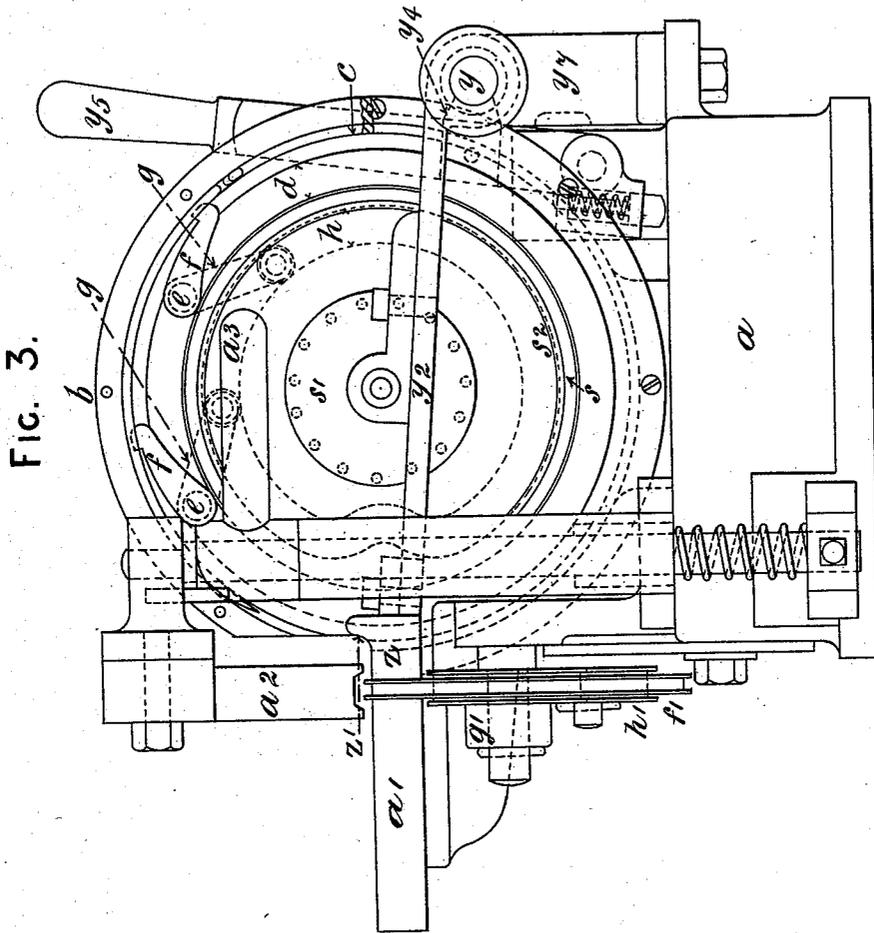


FIG. 3.

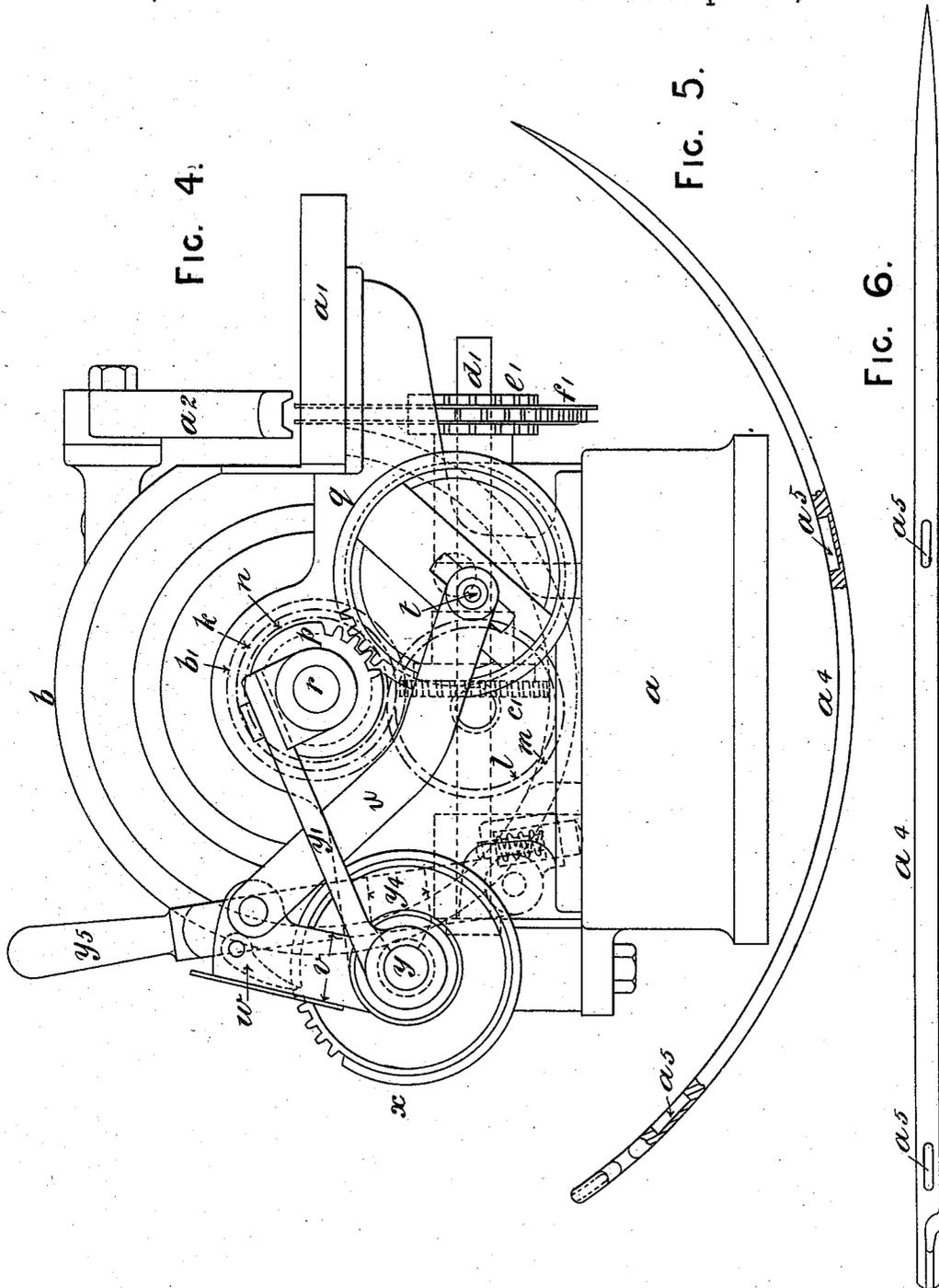
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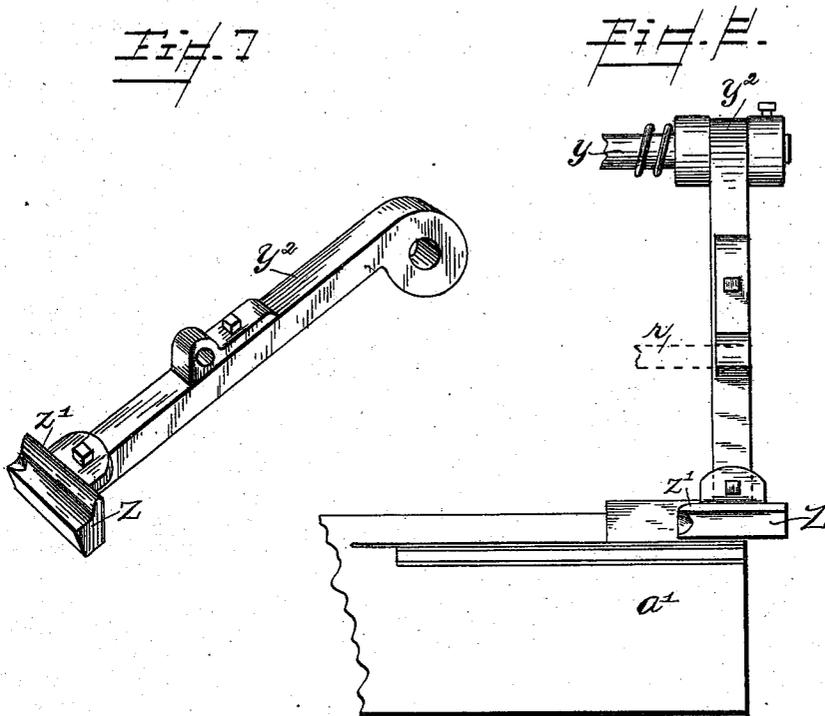
(Model.)

5 Sheets—Sheet 5.

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WITNESSES,

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# UNITED STATES PATENT OFFICE.

WILLIAM WEBSTER, OF ARMLEY, LEEDS, COUNTY OF YORK, ENGLAND.

## OVEREDGE SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 402,497, dated April 30, 1889.

Application filed April 26, 1887. Serial No. 236,261. (Model.) Patented in England September 13, 1880, No. 3,725, and April 15, 1887, No. 5,521.

*To all whom it may concern:*

Be it known that I, WILLIAM WEBSTER, a subject of the Queen of Great Britain and Ireland, residing at Armley, Leeds, in the county of York, Kingdom of Great Britain and Ireland, have invented new and useful Improvements in Overedge Sewing-Machines, of which the following is a specification.

My invention has reference to improvements in sewing-machines of the kind in respect of which a former patent was granted to me, No. 182,249, dated September 12, 1876, and patented to me in Letters Patent of Great Britain, Nos. 3,725 of 1880 and 5,521 of 1887.

According to my present invention, instead of having a movable disk or head-stock with a race in which a curved needle travels while stitching, as in the invention above referred to, I construct the machine with a fixed head-stock, in which is the race for the curved needle, which is driven by arms having projections at their outer ends that engage with suitably-formed parts of the needle. These arms are formed with or mounted upon axles carried in a rotary carriage. These axles have other arms or levers, which may be provided with cam-rollers that engage with a cam secured to the before-mentioned fixed head-stock. This cam serves to disengage each driving-arm successively from the needle as it approaches the material that is being stitched and to cause re-engagement of the driving-arm with the needle after such arm has passed the material, the arrangement being such that at all times one or other or all of the driving-arms, when more than two are used, will be in engagement with the needle, so as to continue its rotation.

The rotary carriage, in which are mounted the axles of the driving-arms, is caused to rotate within the before-mentioned fixed head-stock, and is in connection with the driving-pulley of the machine. I use what is known as a "take-up cylinder" for carrying the thread. This cylinder has an intermittent retiring motion during stitching, and also a device for causing tension to the thread or stitches. I also use a traveling guide-rest, that serves to turn up and present the edges

of the material under treatment in a suitable position for being stitched. It also assists in supporting it during stitching. The traveling movement of the rest corresponds to that of the take-up cylinder.

The material is fed into the machine by a serrated endless-chain movement.

My improved machine will be more fully understood by the following detailed description, and by reference to the accompanying drawings.

Figure 1 is a front elevation of an overedge sewing-machine according to my invention. Fig. 2 is a plan, partly in section. Figs. 3 and 4 are end elevations, on an enlarged scale, at A and B of Figs. 1 and 2, respectively. Fig. 5 shows the curved needle  $a^4$  in side view. Fig. 6 shows the developed inner circumference thereof and the perforations  $a^5$ , by which it is propelled. With the exception of the eye (which is open on one side) its surface is smooth; and Figs. 7 and 8 are details.

Similar letters refer to similar parts throughout the several views.

$a$  is the bed of the machine, mounted upon suitable standards, (not shown in the drawings;)  $a'$ , the table;  $b$ , the fixed head-stock in which is the race or groove  $c$ , in which the needle  $a^4$  travels or rotates.

$d$  is a carriage that rotates within the fixed head-stock  $b$ , and in which are the bearings of the axles  $e e$  of the needle-driving arms  $f f$  and levers  $g g$ , on the extreme ends of which are rollers that take into the stationary cam  $h$ , secured to the fixed head-stock  $b$ .

$i$  is the driving-pulley, and  $j$  a sleeve connecting the said pulley to the rotating carriage  $d$ .

On the sleeve  $j$  is fixed the wheel  $k$ , the first of a train employed for driving, and at the same time accelerating the speed of the thread-cylinder  $s$  over that of the carriage  $d$ , which both rotates and slides endwise within said carriage, as hereinafter referred to. The said wheel  $k$  drives the wheel  $l$ .

$m$  is a wheel in one with  $l$  and drives the wheel  $n$ , their respective numbers of teeth being such as to give an increased speed to  $n$ , which, being in connection with the shaft

$r$ , upon which is the thread-take-up cylinder  $s$ , communicates the accelerated speed thereto, above referred to. The said wheel  $n$  has a sleeve which passes through the bearing  $o$ , and on its outer end is the pinion  $p$ , that drives the crank-wheel  $q$ . From the stud  $t$  in the crank-wheel  $q$  motion is imparted by means of the link  $u$ , lever  $v$ , and pawl  $w$  to the ratchet-wheel  $x$ , for giving an intermittent rotating motion to the bar  $y$ , through which it passes. This bar has on it at one part a screw,  $y^3$ , with which engages a nut-segment,  $y^4$ . This is incapable of motion in the direction of the axis of the bar  $y$ , (but can be disengaged therefrom at pleasure by the handle  $y^5$ ) and causes an intermittent endwise motion thereto, which, being imparted through the arm or connector  $y^6$  to the shaft  $r$  of the thread-take-up cylinder  $s$ , and by means of the arm  $y^3$  to the traveling guide-rest  $z$ , thus causes a traveling endwise motion to these parts.

$y^6$  is a spring for causing the bar  $y$  to resume its normal or forward position on the removal from the screw-thread  $y^3$  of the nut-segment  $y^4$ . The spring acts against the bearing  $y^7$  at one end and against the collar  $y^8$ . On the bar  $y^9$  is a stop for determining the extent of such movement.

$s'$  is a rim of bristles, and  $s^2$  a rim of leather with a serrated or scalloped edge. These are attached to the end of the thread-take-up cylinder and rotate therewith, and form the tension apparatus, the friction of which against the thread as it is cast from the thread-cylinder causes the tightening of the stitches.

I will now describe the operation of stitching.

The thread being prepared in suitable lengths, one of these is taken in a double or loop form and passed into the hooked eye of the needle, and the seam to be stitched being placed in position the needle with the thread is caused to rotate, during which the thread is passed through the material and also around the thread-cylinder, a loop of thread being laid around the thread-cylinder at each revolution of the needle. These loops being now through the material and somewhat loosely around the cylinder are as yet untightened as stitches; but when the whole or nearly the whole of the thread has been in this manner laid on the cylinder and the rear end of the thread is knotted or otherwise fixed in the material which is being automatically advanced by the feeding device of the machine, while at the same time the cylinder is caused to gradually retire, as previously described, a loop or a portion of the thread slips or is cast off the end of the cylinder and passes over the end of the leather rim  $s^2$  and between the ends of the bristles  $s'$ , and a plate,  $s^3$ , or its equivalent, which, as shown, bears against the said bristles and rotates therewith, which thus acts frictionally upon and tightens such slipped or cast-off loop into a complete stitch as it squeezes past the said bristles and be-

tween them and the said plate  $s^3$ , or its equivalent. On a stitch being tightened, as just described, a certain portion of that part of the slipped or cast-off thread (being slack) is again taken up by the cylinder during its rotation and again cast off, when the tightening of another stitch takes place, as before. While this tightening of the stitches is taking place and the material is advancing, the needle continues the formation of loose stitches and the number of loops gradually diminish upon the retiring cylinder until the whole of the thread is cast off and the whole of the stitches are tightened, when the needle is replenished and the stitching continued. It will thus be seen that the thread wanes at both ends—that is, in first forming the loose stitches by the needle and then in the tightening of the same, as just referred to.

$z$  is a device which I call a "traveling guide-rest," and is situated in that part of the table  $a'$  near the end of the take-up-thread cylinder. One part of its surface is on the same level as the table, and in this position it will be obvious that it assists in supporting the work during the passage of the needle and thread through it. The other part,  $z'$ , of its surface is higher than the table and has a rounded form. This projecting part raises the edges of the seam under treatment, so that the needle will pass through it at about right angles to the body thereof, while at the same time the raised part acts as a "drag" upon the material against the frictional action of the tightening device above referred to. This guide-rest is caused to travel backward at the same times and speed as the thread-cylinder by its being connected to the said intermittently-moving bar  $y$  by the arm  $y^2$ .

The feeding of the material under treatment varies from that referred to and described in my former specification, No. 182,249, dated September 12, 1876, previously referred to, and is effected by means of the sidewise-acting cam or drunken screw  $b'$ , taking into and imparting an intermittent rotating motion to a worm-wheel,  $c'$ , on the shaft  $d'$ . On this shaft is a sprocket or chain wheel,  $e'$ , that takes into and propels the serrated pitch-chain,  $f'$ , the teeth of which project sufficiently above the table  $a'$  to pierce and carry forward the material. The said chain then passes downward over the end of the table and returns over guides  $g$  and  $h$  to the sprocket or chain wheel, and so on, continuing its cycle of motion.

$a^2$  is the pressure-foot for causing the material to be carried along by the pitch-chain  $f'$  by pressing it upon the serrations.

$a^3$  is a handle for raising the said foot, so as to admit of the material being placed in the machine.

Having described and ascertained the nature of my said invention and the manner in which the same is to be carried into practical effect, I hereby declare that what I claim is now as follows:

1. In an overedge sewing-machine, the com-

5 combination, with a fixed head-stock, such as *b*,  
 provided with a needle race or groove, a  
 curved needle traveling in said groove, the  
 driving-arms *ff*, having axles *ee*, a carriage,  
 10 *d*, that rotates within the fixed head-stock, a  
 fixed cam, *h*, attached to said head-stock, and  
 arms *gg*, (on said axles,) the ends of which  
 take into and are controlled by said fixed  
 15 cam, substantially as and for the purposes de-  
 scribed.

2. In combination with the take-up-thread  
 cylinder *s* and its shaft *r*, the wheel *n*, pro-  
 vided with an internal feather to engage with  
 a groove in said shaft, the crank-wheel *g*, pro-  
 15 vided with the stud *t* to drive said cylinder,  
 the bar *y*, provided with the screw *y*<sup>3</sup>, the link  
*u* and the lever *v*, by which the said bar is  
 connected to the said stud and crank-wheel, the  
 arm *y'*, connecting the bar *y* and the shaft *r*,  
 20 the ratchet-wheel *x*, and pawl *w*, to which mo-  
 tion is imparted through link *u* and lever *v* to

bar *y*, the nut-segment *y*<sup>4</sup>, engaging with the  
 screw *y*<sup>3</sup>, the traveling guide-rest *z*, the arm  
*y*<sup>2</sup>, connecting said guide-rest and the bar *y*,  
 and handle *y*<sup>5</sup>, whereby an intermittent rotat- 25  
 ing and endwise motion is given to the bar *y*  
 and to the thread-cylinder *s*, substantially as  
 described.

3. In an overedge sewing-machine, the trav-  
 eling guide-rest *z*, provided with a rounded 30  
 part, *z'*, to raise the edges of the seam, in  
 combination with the shaft *r*, connecting-  
 arms, and a take-up on said shaft, the said  
 parts traveling in unison with each other,  
 substantially as described.

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