(No Model.) 2 Sheets—Sheet 1.

H. SCHULZE-BERGE.

OVERSEAMING MACHINE.

No. 344,872. Patented July 6, 1886.

Fig. 1.

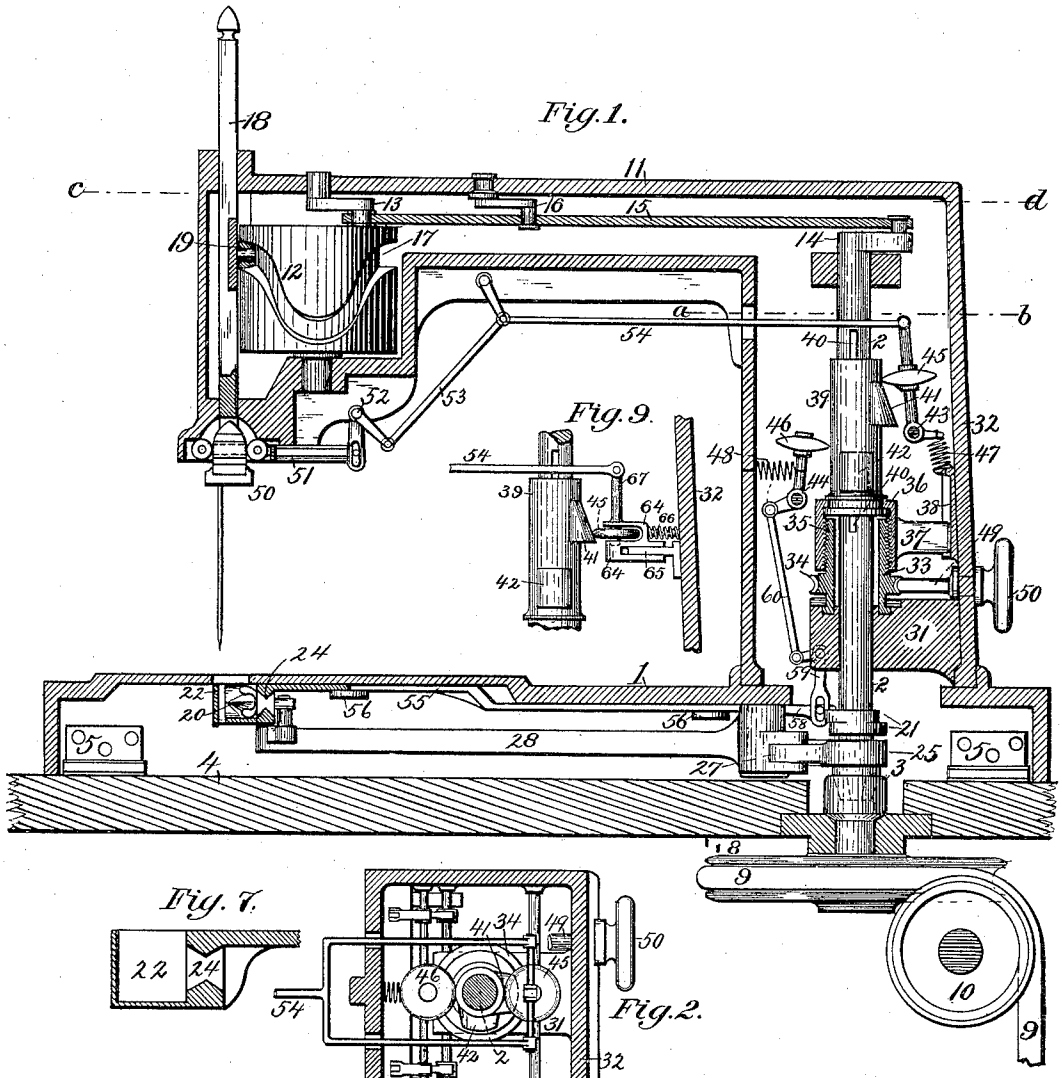
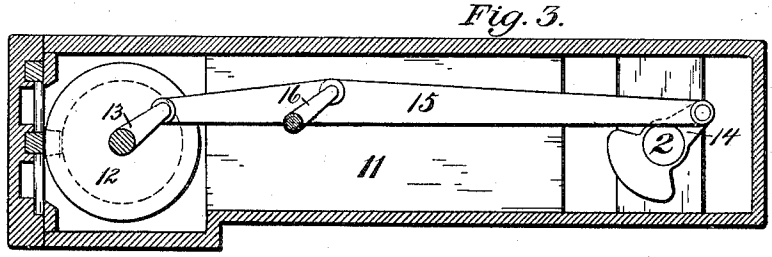


Fig. 9.

Fig. 7.

Fig. 2.

Fig. 3.



WITNESSES

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Fig. 4.

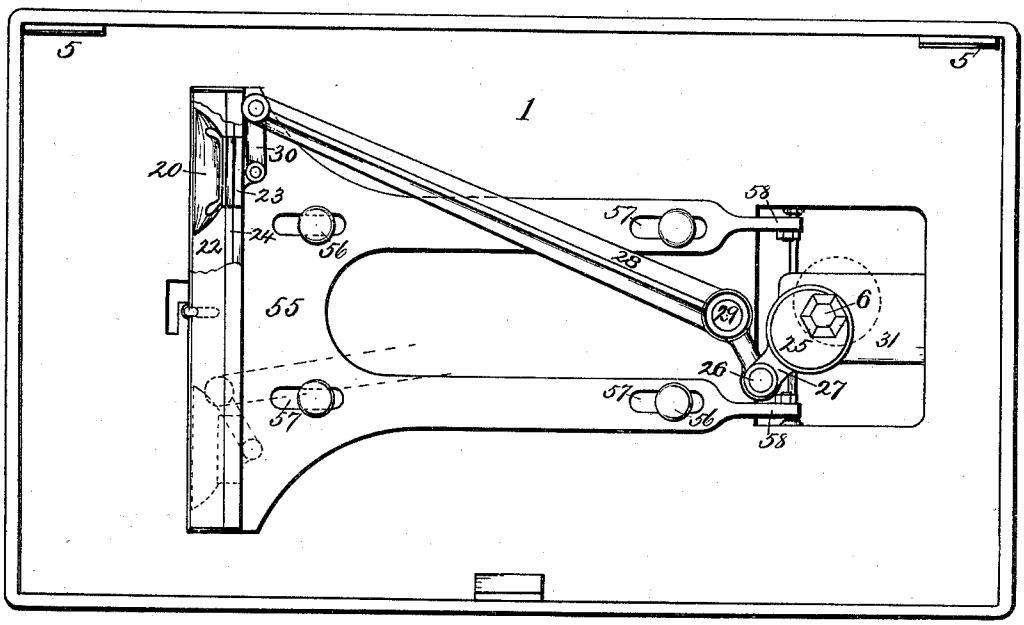


Fig. 8.

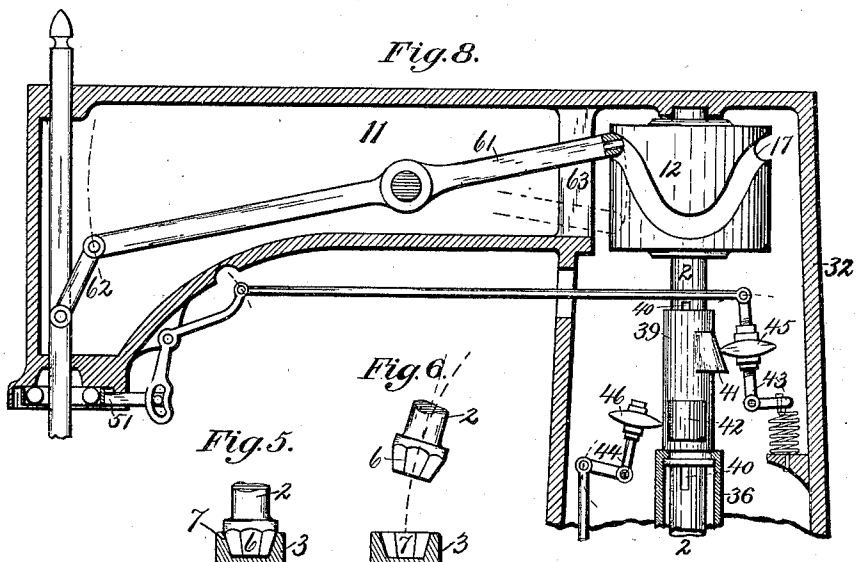


Fig. 6.

Fig. 5.

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UNITED STATES PATENT OFFICE.

HERMANN SCHULZE-BERGE, OF ROCHESTER, PENNSYLVANIA.

OVERSEAMING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 344,872, dated July 6, 1886.

Application filed April 4, 1885. Serial No. 161,222. (No model.)

To all whom it may concern:

Be it known that I, HERMANN SCHULZE-BERGE, of Rochester, in the county of Beaver and State of Pennsylvania, have invented a new and useful Improvement in Overseaming-Machines; and I do hereby declare the following to be a full, clear, and exact description thereof.

My present improvement relates to sewing or stitching machines, and more especially to that class known as "overseaming-machines."

It is illustrated in the accompanying two sheets of drawings, in which Figure 1 is a vertical longitudinal section through the bed-plate and arm. Fig. 2 is a horizontal section on the line *a b* of Fig. 1. Fig. 3 is a horizontal section on the line *c d* of Fig. 1. Fig. 4 is a view of the under side of the bed-plate with its attachments. Figs. 5, 6, and 7 are views of details of construction. Fig. 8 is a vertical longitudinal section of a modified form of arm. Fig. 9 is a modification.

Like figures of reference indicate like parts.

In order to show the improvements more distinctly, the cloth-feeding mechanism, the take-up, the presser-foot, and other devices common to sewing-machines, which in this one may be of the usual type, are not illustrated in the drawings, in which—

1 indicates the bed-plate, and 2 a vertical driving-shaft stepped in revolving spindle 3. The bed-plate 1 is hinged to the table 4 at 5, so as to be capable of turning back, in order to expose the parts mounted thereon for purposes of oiling, cleaning, repairs, &c., and when the bed-plate is thus turned it moves in a curved line, describing an arc of a circle of which the hinges are the center.

To insure the proper seating of the shaft 2, the lower end of the shaft is made of pyramidal form, as shown at 6, Figs. 1, 5, 6, and 7, and the socket 7 is its counterpart. This form admits of the hinging of the bed-plate, as and for the purposes described, and insures the guiding and seating of the shaft 2 in its step 7.

The spindle 3 is provided with a pulley, 8, which is connected with treadle-work (not shown) by a belt, 9, conducted over two vertical guide-wheels, 10, only one of which can be seen, the one on the opposite side of the pulley 8 being concealed by the near one. The belt 9 passes over the front guide-wheel 10 to the pulley 8, leaving which, it passes over the rear guide-wheel 10 to the fly-wheel of the treadle.

The rotary motion of the driving-shaft is converted into a reciprocating motion at the stitching mechanism, as shown in Figs. 1 and 3.

The arm of the machine is indicated at 11, and at its outer end is a rotatory cylinder, 12, having a crank, 13, which is connected with the crank 14 of the driving-shaft 2 by means of a pitman, 15, whereby a revolving motion is communicated from the driving-shaft 2 to the cylinder 12.

The pitman 15 is provided with an intermediate guide-crank, 16, which is of the same length as the cranks 13 and 14 and parallel thereto, but is journaled in the arm 11, out of line with the cranks 13 and 14, and its function is to prevent the pitman, when on the dead-point of the axes of the shaft 1 and cylinder 12, from going the wrong way.

The revoluble cylinder 12 is provided with a cam-groove, 17, and mounted in vertical guides at the outer end of the arm 11 is a needle-bar, 18, provided with a roller, 19, which projects into the cam-groove 17. The cam-groove has two convolutions, so that one revolution of the cylinder 12 will cause the needle-bar to perform two complete reciprocations. The groove 17, however, may be made so as to cause one, two, or more reciprocations of the needle-bar at each single revolution of the cylinder 12 or driving-shaft 2 by giving it the requisite number of convolutions, and by the construction described, which is simple and not liable to get out of repair, a rapid and positive motion is given to the needle-bar.

The shuttle 20 is operated from the main driving-shaft 2 in the manner indicated in Figs. 1 and 4.

On the lower end of the driving-shaft 2 are cams 21, from which the cloth-feeding mechanism may be operated.

The shuttle 20 moves in a race, 22, on the under side of the bed-plate 1, being secured to a carrier, 23, which moves in V-shaped guides 24, Figs. 1 and 7.

On the lower end of the driving-shaft 2 is an eccentric, 25, Fig. 4, having a yoke, 26, provided with arm or lever 27, which is pivotally connected with the short arm of the shuttle-lever 28. The shuttle-lever is journaled or

centered at 29, and its long arm is pivotally connected to a link, 30, which in turn is pivoted to the shuttle-carrier 23. The revolution of the eccentric 25 with the driving-shaft 2 causes the shuttle-lever 28 to oscillate on its center 29, and communicates a reciprocating motion to the shuttle 20 in the race 22, as indicated by the full and broken lines in Fig. 4.

As the stitching mechanism is arranged to have two full reciprocations during a single revolution of the driving-shaft, the shuttle herein shown is constructed to sew both ways.

It is obvious that other constructions can be used for the purpose of moving the shuttle at any desired speed with relation to a single revolution of the driving-shaft.

Another feature of my invention consists in mechanism to communicate a side throw to the needle and shuttle, and to adjust such side throw either while the machine is in operation or at rest. Referring to Figs. 1, 3, 4, and 8, I will now explain how this adjustable side throw of the needle and the corresponding lateral movement of the shuttle is obtained by means of revoluble cams, and rollers forced against the cams by spring-power. The shaft 2 passes through a projection or bearing, 31, which extends out from the side of the vertical case 32, and stepped in this projection is a hollow shaft or sleeve, 33, which encircles the shaft 2, and is provided with the worm-wheel 34 and externally threaded above the worm-wheel. Surrounding the threaded portion 35 is an internally-threaded sleeve, 36, provided with a radial wing or arm, 37, which extends between vertical guides 38, formed on the inner face of the case 32. Secured to the sleeve 36, by a collar or lugs extending into a circular groove, or otherwise, so as to permit the sleeve 36 to turn freely, is a hollow cam-sleeve, 39, which encircles the shaft 2 loosely, so as to slide axially thereon, but is caused to turn therewith by a feather or key which extends into the groove or key-seat 40. On the cam-sleeve 39 are two cams, (there may be four or more,) 41 42, gradually increasing in height and each occupying one-fourth or other determined fractional part of the cylindrical circumference of the cam-sleeve. They are arranged at different heights, and there is a plain cylindrical surface between them. Mounted loosely on the longer arms of the bell-cranks 43 44, so as to turn freely thereon, are rollers 45 46, which are caused to bear against the surface of the cam-sleeve, as shown in Fig. 1, by the action of the springs 47 48. When in the position of Fig. 1, the cams 41 42 have no effect, but when they are raised, so as to revolve under the rollers 45 46, as shown in Fig. 8, they communicate an oscillation to the cranks 43 44, which is utilized to effect the lateral movement of the needle and shuttle. The vertical movement of the cam-sleeve 39 is effected by the revolution of the worm-wheel 34, caused by a screw-shaft, 49, which extends through the side of the case 32, and at the outer end is provided with a disk or head, 50, by which it is turned. The rotation of the hollow shaft 33, by its worm-wheel 34, causes its threaded portion 35 to act on the sleeve 36, which, being held from turning by its wing 37, is forced to rise vertically, carrying with it the cam-sleeve 39, until the cams 41 42 are raised into the same horizontal planes as the rollers 45 46. The requisite length of lateral throw of the needle and shuttle is obtained by the greater or less vertical adjustment of the cam-sleeve 39, and this adjustment can be effected as well when the machine is in motion as when at rest. The lateral movement is communicated to the needle-bar 18 as follows: The lower end of the needle bar terminates in a needle-foot, 50, which is actuated laterally by a slide, 51, as described in an application, No. 155,220, filed by William H. Garland and myself on February 7, 1885. The slide 51 is pivotally connected with an angle-lever, 52, pivoted to the arm 11, the other arm of which lever is connected to a rod, 53, which in turn is connected to a rod, 54, connected to the bell-crank 43, the latter having a bifurcated end, so as to reach past the driving-shaft 2. (See Fig. 2.) The oscillating movement which the cam 41 gives to the bell-crank 43 is communicated by the rods 54 53, angle-lever 52, and slide 51 to the needle-foot 50, and produces the desired side movement of the needle.

The lateral movement of the shuttle is obtained as follows: The shuttle-race 22 is connected to a sliding plate, 55, sustained on the under side of the bed-plate 1 by headed pins or screws 56, (see Figs. 1 and 4,) which project through slots 57 in the plate. The plate 55 may be cut away at the middle to lighten it, forming two arms terminating in stems 58, which are pivotally connected with the lower arms of two angle-levers 59, (one of which is shown in Fig. 1,) pivoted to the bearing 31. The other ends of the angle-levers 59 are connected with the bell-crank 44 by the rods 60. The oscillating movement which the cam 42 gives to the bell-crank 64 is communicated by the rods 60 and angle-levers 59 to the sliding plate 55, and consequently to the shuttle, producing the desired lateral movement corresponding to the side throw of the needle.

Instead of making the cams adjustable, they may be rigidly attached to the shaft 2, and the rollers 45 46 be mounted on vertically-adjustable slides, so as to be capable of being moved into and out of engagement with the cams, as will be understood, the only difference being that the rollers are adjustable instead of the cams.

In some well-known and extensively-used machines the shuttle is guided in a race at right angles to the feed of the cloth, and the needle has a side throw in line with the feed. In such machines the side throw of the needle is not adjustable. My improved means for giving a side throw to the needle is applicable to such machines.

In using the term "sewing-machine" I mean to include also stitching-machines—such as are used for embroidering, knitting, and crocheting—to which my improvements are applicable.

In Fig. 9 I show how the rollers 45 and 46 can be applied to spring-slides to give the motions necessary to communicate the lateral movements to the needle-foot and shuttle-race. In this case, instead of the levers 43 44, I use a slide, 64, moving on a slideway or plate, 65. The roller 45 is journaled in the slide, and is held in contact with the cam 41 by the pressure of the spring 66, which bears against the rear side of the cam. Rising from the slide is an arm or post, 67, to which the rod 54 is pivoted. The movement of the slide 64, acting through the rod 54 and its connections, gives the side throw to the needle. The same construction is applicable to the roller 46, as will be apparent.

In Fig. 8 I show a modification, in which the cylinder 12 is mounted on the upper end of the shaft 2, and a lever, 61, pivoted to the arm 11, with one end extending into the cam-groove and the other connected by a pivoted link, 62, to the needle-bar, communicates a reciprocating motion to the needle-bar. The lever 61 moves in a guide-slot, 63, which prevents any lateral movement. It is apparent that in this construction, also, any desired number of reciprocations of the needle-bar can be obtained by providing the cam-groove with the requisite number of convolutions.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a sewing-machine, the combination of a revoluble shaft provided with cams, rollers bearing elastically on the cam-surface, slides actuating the needle-foot and shuttle-race, and power-connections between the shafts of the rollers and the slides, whereby the motion of the rollers to and from the shaft is caused to effect the side throw of the needle and the corresponding lateral movement of the shuttle, substantially as and for the purposes described.

2. In a sewing-machine, the combination of a driving-shaft having a vertically-adjustable cam-sleeve thereon provided with cams, with rollers mounted on shafts which bear with an elastic pressure against the surface of the cam-wheel, slides connected with the needle-foot and shuttle-race, and connections between the shafts and the slides, substantially as and for the purposes described.

In testimony whereof I have hereunto set my hand this 10th day of March, A. D. 1885.

HERMANN SCHULZE-BERGE.

Witnesses:
W. B. CORWIN,
JNO. K. SMITH.