

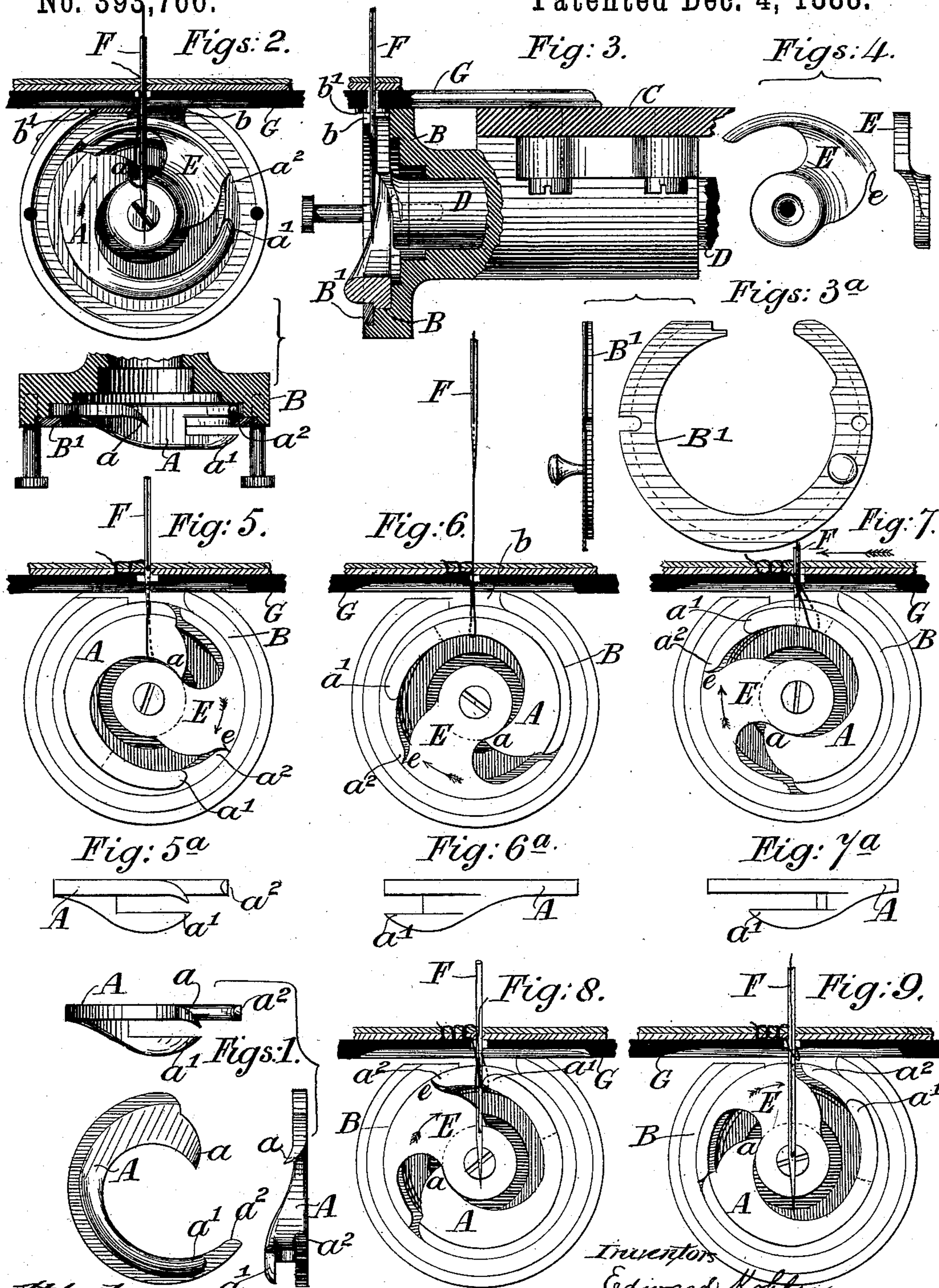
(No Model.)

E. KOHLER & M. LACHMAN.

REVOLVING HOOK FOR SEWING MACHINES.

No. 393,766.

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UNITED STATES PATENT OFFICE.

EDWARD KOHLER, OF WEST OAKLAND, AND MORRIS LACHMAN, OF SAN FRANCISCO, CALIFORNIA.

REVOLVING HOOK FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 393,766, dated December 4, 1888.

Application filed September 7, 1887. Serial No. 248,993. (No model.) Patented in England April 29, 1887, No. 6,295.

To all whom it may concern:

Be it known that we, EDWARD KOHLER, of 861 Chester street, West Oakland, California, United States of America, and MORRIS LACHMAN, of 1810 Laguna street, San Francisco, California, United States of America, have invented certain new and useful Improvements in Sewing-Machines, of which the following is a specification, the said improvements being embraced in the Letters Patent of Great Britain No. 6,295, of April 29, 1887.

This invention relates to that class of sewing-machines in which a single thread for the production of a chain-stitch is used, the principal objects of the invention being to increase the speed of working and to improve the strength and quality of the sewing.

Our invention is applicable to various constructions of single-thread sewing-machines in which a horizontal shaft is provided below the table. To this shaft we fit a driver for rotating a loose looper of peculiar construction. This looper works in a fixed circular race, in front of which the vertical needle vibrates, to present its open loop to the nose of the looper.

We have not considered it necessary to show our invention as adapted to a sewing-machine, as the only change necessary for its adaptation is the fitting of the ordinary looper-shaft with a driver for rotating the looper. The rotation of this looper will be continuous, and no change will be required in the timing of the reciprocating needle or in the timing of the feed.

Our improved looper is nearly annular in form, its perimeter extending over rather more than three-quarters of the circle. The nose of the looper is pointed and is of its greatest thickness vertically—that is, in the direction of the length of the needle—near its nose. From the nose the looper gradually decreases in vertical thickness and increases in lateral thickness to its heel, so as to open out the loop of the needle, and at its heel the looper is forked for the purpose of providing a space for the needle to pass into within the plane of rotation of the looper, in order to take the last-formed loop from the looper. The looper is secured in its circular race by a retaining-ring, which fits an annular rabbet in the face

of the race, and the race we preferably form in one with the front bearing of the shaft upon which the looper-driver is mounted.

In the accompanying drawings, Figure 1 shows the rotary looper in side, plan, and edge views, constructed on a scale to take loops of twine such as is used in sewing sacks. Fig. 2 shows the looper, its race, and driver in elevation and in sectional plan, the ring which retains the looper in its race being removed in the elevation to show the looper more clearly. Fig. 3 is a sectional elevation of the looper and its race, taken in the plane of the axis of the driving-shaft. Fig. 4 shows the driver detached in side and edge views. Figs. 5, 5^a, 6, 6^a, 7, 7^a, 8, and 9 show the needle, the looper, and its driver in the successive positions which they take up during the formation of a stitch, the looper being represented in side view in Figs. 5, 6, 7, 8, and 9, and in plan at Figs. 5^a, 6^a, and 7^a.

Referring now to Figs. 2 and 3, A is the loose looper set in its race B, which is made fast to the framing C of the machine.

D represents a horizontal shaft, on the end of which the driver E is mounted. The driver and the looper are so shaped with respect to each other as to provide for a loose interlocking of the parts, a slight play being allowed to provide for the free passage of the thread between them.

F is the vertical eye-pointed needle.

G indicates the table for supporting the work, which may be fed forward in the direction of the arrow, Fig. 7, either by a top or under feed device.

The form of the looper A is peculiar, and will be best understood by reference to Fig. 1. The nose *a* of this looper is bent outward to meet the needle on its descent and pass through the loop which the needle has just brought down through the work and presented to the looper. The tail end of the looper is forked, the outer prong, *a'*, being somewhat shorter and narrower than the inner prong, *a''*, for the purpose to be presently explained. The thickness of the looper is, as will be seen, greatest vertically near the point or nose, and is decreased in vertical thickness from the point to the heel, while its lateral thickness is increased at the forked

part, and it thereby serves to spread the loop as the looper in its rotation passes through it. An opened loop is thus presented to the point of the needle at each succeeding descent of the same for the purpose of taking up the loop as the looper leaves it to enter the next succeeding loop formed by the needle.

The face of the looper is rabbeted to permit of its lying close against the retaining-ring B', which is shown in place in Fig. 3, and detached and in side view at Fig. 3^a. The driver E (shown detached at Fig. 4) is so shaped as to form with the race a bed for the looper. Its extremity *e* strikes the tail *a*² of the looper and causes it to revolve in its race, but leaves the looper free to yield to the drag of the loop, and thereby leave room for the loop to escape from the tail of the looper. We have said that the prongs *a*¹ *a*² are of different lengths. This provides for the loop leaving the looper gradually, the needle in its descent taking up the slack as the thread escapes from the prong *a*¹, and thereby commencing the operation of tightening the stitch before the loop finally escapes from the tail of the looper. The race B is recessed, as at *b*, to provide free play for the descending needle and for the escape of the loop from the looper. To prevent the loop being caught by the angle formed by the recess, the angle is extended outward, as a finger, at *b'*, which will guide the escaping loop out of the race when being drawn up to tension.

We will now explain the action of the mechanism, reference being had to Figs. 2, 5, 6, 7, 8, and 9.

Fig. 2 shows the needle raised from its lowest position and presenting a loop to the looper, the nose of which is just entering the loop.

Fig. 5 shows the nose of the looper fairly through the loop.

Fig. 6 shows the position of the parts when the needle has risen to its highest position and tightened the stitch. At this time the looper has passed half-way through the loop, and the broad or forked part of the looper is now presented to the loop for the purpose of opening it out and presenting it to the needle.

Fig. 7 shows the position of the parts after the feed has taken place, the looper holding the opened-out loop in an inclined position, ready for the descending needle to enter it and carry through the next succeeding loop for presentation to the nose of the looper.

Fig. 8 shows the loop in the act of escaping

from the prong *a*¹ of the looper, the needle having descended to a position for taking up the slack.

Fig. 9 shows the position of the parts when the looper has passed through the loop and the pull of the descending needle has drawn the loop from the longer prong, *a*², of the looper. The return movement of the needle next opens out a loop for the looper to take up, which will be effected by the continued action of the driver bringing the nose of the looper into the position shown at Fig. 2, when the operations above described will be repeated. The completion of the stitch, it will be understood, is effected by the rise of the needle to the position of Fig. 6, while the last-formed loop is retained upon the looper. It will be seen that the tail end, *a*², of the looper and the shoulder *e* of the driver are severally rounded off. This facilitates the passage of the escaping loop from between these two contact-surfaces.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is—

1. The combination, with the race B, of the loose looper A and the rotary driver for operating the looper, substantially as described, said looper consisting of an open ring having its forward end or nose pointed to enter the loop formed by the needle, and its rear end or heel forked to permit the passage of the needle through the loop held by the looper, the vertical thickness of said looper decreasing from near the point to the heel and its lateral thickness increasing at the forked heel to open out the loop, substantially as described.

2. The combination, with the race B, of the loose looper A, consisting of an open ring having its nose pointed to enter the loop formed by the needle and its heel broadened and forked to permit the passage of the needle through the loop held by the looper, one prong of said fork being shorter than the other, substantially as described.

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