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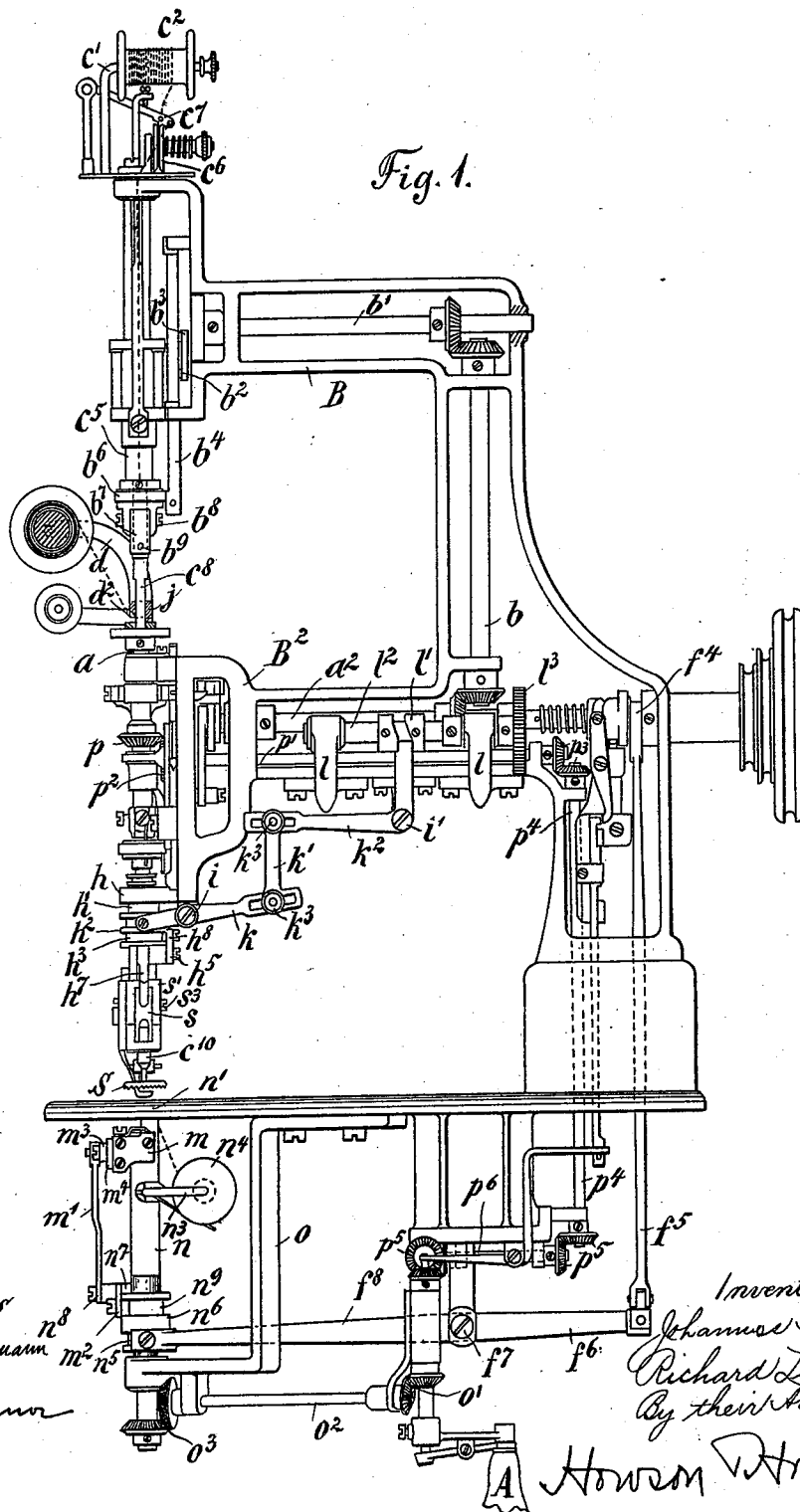
3 Sheets—Sheet 1.

J. HAAS & R. LINTZ.
EMBROIDERING MACHINE.

No. 548,984.

Patented Oct. 29, 1895.

Fig. 1.



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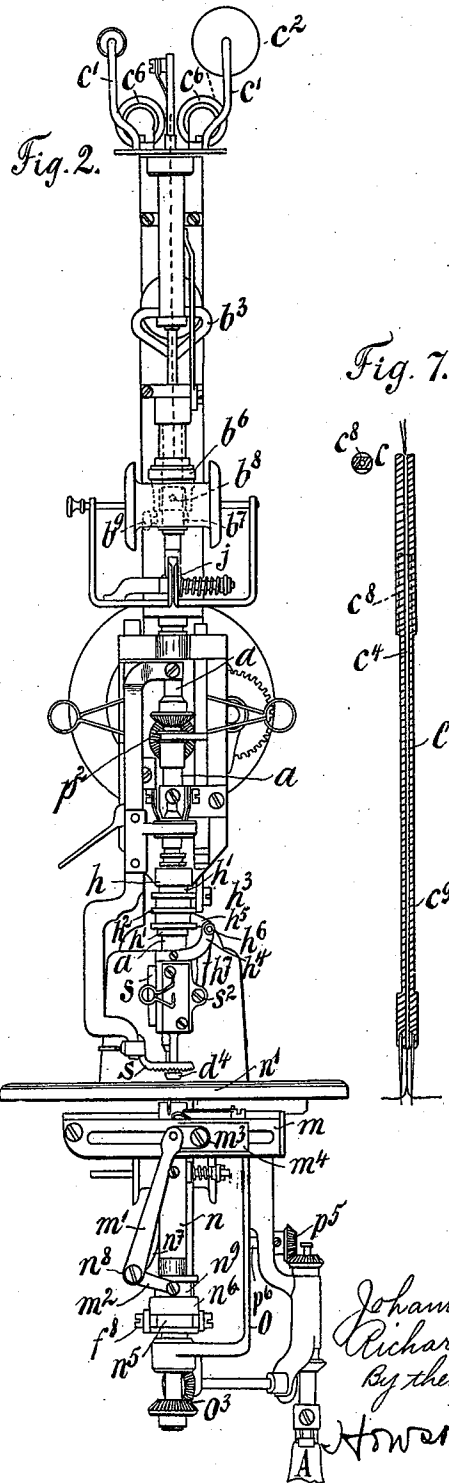
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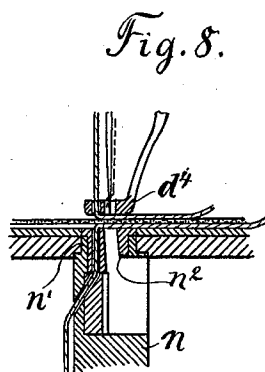
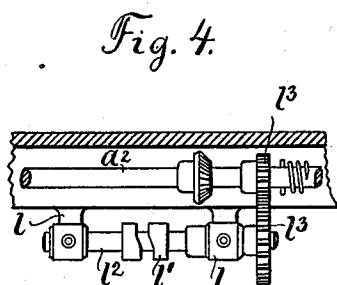
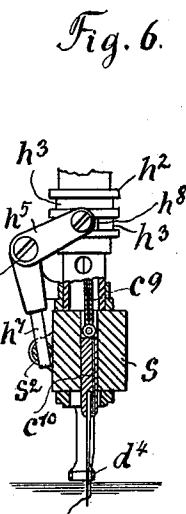
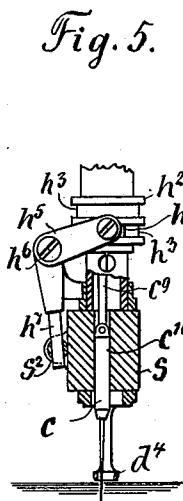
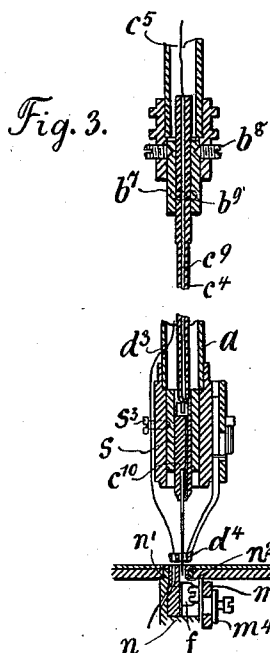
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UNITED STATES PATENT OFFICE.

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EMBROIDERING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 548,984, dated October 29, 1895.

Application filed February 12, 1894. Serial No. 499,936. (No model.)

To all whom it may concern:

Be it known that we, JOHANNES HAAS, residing at No. 1 Postplatz, Eibenstock, and RICHARD LINTZ, residing at No. 109 Grüner Weg, Berlin, Germany, subjects of the Emperor of Germany, have invented certain Improvements in Sewing-Machines for Braiding or Cording, of which the following is a specification.

Our invention relates to sewing-machines of that class which is especially adapted for braiding or cording, and in which the fabric is guided by means of a presser-foot movable in all directions by means of a crank-handle. According to our invention we make use of a shuttle moving to and fro or reciprocating, and so construct the machine that any kind of sewing can be employed for the purpose of sewing on braid, ribbon, strings of pearls, or other strings consisting of one or several rows lying parallel to one another. Thus not only is it possible to execute the simple ordinary kind of needle-work with this machine, but also zigzag stitching and such as is done with several upper threads. Further, cords can be simultaneously sewed onto both sides of a fabric. This versatility is obtained by providing means whereby such a rotation is imparted to the rectilinear guide for the shuttle simultaneously with the needle-bar that the path traversed by the shuttle remains constantly the same relatively to the eye of the needle. The path of the shuttle and the needle-bar can thus never rotate in a direction opposite to each other, and special importance is attached to the fact that the needle-bar is prevented from rotating independently of the path of the shuttle. The required rotation is obtained by causing both the movably-arranged shuttle-carrier and the needle-bar to be driven by the same crank which serves for guiding the direction of the presser-foot. The sewing on of a lower cord simultaneously with an upper cord is effected by attaching on the support of the guide or race in which the shuttle-carrier slides a cord-guide which stands vertically below the upper cord-guide. With the same object a reel-carrier is attached to the said support. The lower part of the needle-bar is so jointed that it can be shifted laterally by means of a suit-

able thruster, so that when executing a zigzag line of sewing the needle always remains at right angles to the fabric. When, however, it is desired to sew on simultaneously two cords lying parallel to each other side by side, each with its special thread, a rigid needle-bar is made use of instead of a jointed needle-bar, which rigid needle-bar carries two needles.

To enable our invention to be fully understood, we will describe how it can be carried into practice by reference to the accompanying drawings, in which—

Figure 1 is a side elevation of a sewing-machine constructed according to our invention. Fig. 2 is a front elevation of the same, and Figs. 3 to 8 are sectional views of details.

The up-and-down motion of the needle-bar *c* is effected from the main spindle *a*² by means of spindles *b* and *b'*, which are in connection with the main spindle through bevel-wheels. On a plate at the end of the spindle *b'*, which runs horizontally in the head *B*, is placed a crank-pin *b*³, which works in a groove in a curved or heart-shaped disk *b*³, fixed on the feeder or thruster *b*⁴, and thus gives an up-and-down movement to the feeder *b*⁴, to which the needle-bar *c* is revolvably attached, Figs. 1 and 2.

The needle-bar is not rigidly attached to the feeder *b*⁴, but is suspended from a grooved ferrule *b*⁶, Figs. 1, 2, and 3, which can rotate in a ring attached to the feeder *b*⁴. The needle-bar is secured to the ferrule *b*⁶ by means of a sleeve *b*⁷, which is pivotally connected to the ferrule by means of screws *b*⁸, the needle-bar being secured in the sleeve *b*⁷ by means of a clamping-screw *b*⁹.

The upper end of the needle-bar is firmly held by the sleeve *b*⁷, and below this point is flattened at the sides at *c*⁸, where it passes through the upper part of the main tube *a* or through suitable guides attached to the latter, and is thus forced to follow the rotation of the tube *a*. This rotation of the tube *a* is effected by means of the crank-handle *A*, through the intervention of appropriate mechanism to be hereinafter described. On the tube *a* is fixed a bevel-wheel *p*, which engages with a similar wheel *p*² upon the spindle *p'*, Fig. 1. The horizontal spindle *p'* is driven from the vertical spindle *p*⁴ by means of a

pair of bevel-wheels p^3 , which are rotated by a similar pair of wheels p^5 and spindle p^6 from the crank-handle A.

The lower part c^{10} of the needle-bar is jointed to the main section of the same c^9 , so that the upper part c^9 , which is connected to the piece b^7 , acts like a connecting-rod. The part c^{10} moves in a vertical direction in a laterally-movable thruster s , Figs. 3, 5, and 6, provided with a corresponding bore, which thruster thus acts as a piston-tube, and its casing s' is secured to the lower end of the tube a and rotates with the latter. By the lateral movement of the thruster s the lateral shifting of the needle-bar is allowed, so that the needle can execute zigzag stitching when required. Above this thrusting mechanism the tube a is surrounded by a casing h' , Figs. 1, 2, and 6, which is secured to the head B^2 by means of an arm h , and on this casing is a second casing h^2 , provided with two annular grooves h^3 and movable in a vertical direction. On an arm h^4 , secured to the main tube a , a bell-crank lever is pivoted at h^5 , one arm h^7 of the said lever engaging with a spindle s^2 , which has its bearing in the thruster s , Figs. 5 and 6, while the other arm h^5 engages with the lower groove h^3 in the casing h^2 by means of a sliding block h^8 , so that a vertical movement of the casing h^2 gives rise to a horizontal motion of the thruster s .

The vertical movement of the casing h^2 is effected by means of the lever k , Fig. 1, which is pivoted at i on the head B^2 . One end of the lever k engages in the upper groove h^3 of the casing h^2 , and the other end is connected by the removable and adjustable connecting-rod k' to the cranked lever k^2 , which is fulcrumed at i' .

On the head B^2 there are further attached two projecting brackets l , Figs. 1 and 4, which carry a spindle l^2 , having a cam l' mounted thereon. This spindle l^2 is rotated from the main spindle a^2 by means of the pair of wheels l^3 , Figs. 1 and 4, and operates the cranked lever k^2 by means of the cam l' . The arms of the levers k and k^2 , which are connected by the connecting-rod k' , are slotted at their ends, and in the slots the pins of the connecting-rod can be shifted for the purpose of altering the throw of the needle. When the regulation has been effected, these pins can be fixed in position on the lever-arms k and k^2 by set screws k^3 .

In Figs. 5 and 6 the extreme positions of the thruster s are shown. The change of the position of the thruster takes place at the highest point of the needle.

The frame m , which guides the shuttle or the carriage or case of the latter, is secured to a rotating spindle n , which spindle is so carried by the bracket o that its axis of rotation coincides with the axis of rotation of the needle-tube a and needle-bar c .

The spindle n has its upper bearing in the table-plate at n' , Figs. 1, 2, 3, and 8, and here carries a lower cord-guide n^2 , which is fixed in

the head of the spindle n , so that it shares in the movement of rotation of the latter, but cannot rotate independently thereof. The hole for the cord in the lower cord-guide n^2 is located exactly opposite the hole for the cord in the upper cord-guide d^4 . The reel-carrier n^3 for the lower cord-reel n^4 is fastened on the spindle n . Rotation is imparted to the spindle n and with it to the frame m simultaneously with the upper members, the tube a and needle-bar c , from the crank-handle A, by means of the pair of bevel-wheels o' , the spindle o^2 , and the pair of bevel-wheels o^3 .

Motion is imparted to the shuttle from the main spindle a^2 itself. Upon this latter is mounted an eccentric f^4 , Fig. 1, the eccentric-rod f^5 of which is jointed to the end of the arm f^6 of the lever $f^7 f^8$, which has its fulcrum at f^7 . The free forked end of the arm f^8 of the lever engages by means of suitable sliding blocks in the annular groove n^5 of the casing n^6 , Figs. 1 and 2, which fits loosely around the spindle n , so that the lever-arm causes a vertical motion of the casing n^6 independently of the movement of rotation of the spindle n . On an arm n^7 , fixed to the spindle n , there is pivoted at n^8 a cranked lever $m' m^2$, the arm m^2 of which engages with the annular groove n^9 in the casing n^6 by means of suitable sliding blocks, and is thus set in motion. The free end of the other arm m' is jointed to the carriage m^4 of the shuttle by means of the link m^3 , and effects the to-and-fro movement of the shuttle. If instead of producing a zigzag kind of sewing with the machine it is desired to sew the cord on with straight stitching in the ordinary way—that is to say, to communicate a simple up-and-down motion to the needle—the connecting-rod k' must be removed by loosening the screws k^3 , and the thruster s be adjusted in its mid-position, and be secured in this position by means of the set screw s^3 .

If it be desired to sew on simultaneously two cords lying parallel to each other, side by side, each with special thread, a rigid needle-bar C, such as is shown in Fig. 7, is made use of, instead of a jointed needle-bar c , which rigid needle-bar carries two needles. In this case, too, the thruster s must be placed in its mid-position and the connecting-rod k' be removed.

If a cord or braid is to be sewed onto the fabric above and below, a needle-bar with a single needle is made use of, the thruster s being, as before, placed in its mid-position. A reel of cord n^4 is then placed upon the reel-carrier n^3 upon the spindle n and the end of the braid drawn upward through the cord-hole in the lower cord-guide n^2 . The cord run off from the upper cord-reel d' having then been drawn through the cord-hole of the upper cord-guide d^4 , the fabric can be inserted between the cords, as shown in Fig. 8. The upper cord can be guided along the needle-bar by being threaded into the tube a at d^2 , Fig. 1, and out again at d^3 , Fig. 3. The upper sew-

ing-threads are then drawn from the reels c^2 , which are placed upon the reel-carriers c' , in the usual way, through the thread tension c^6 and thread-lever c^7 . Through proper openings provided in the plate c^3 the thread passes downward into the tube-piece c^5 , and through the thread-passage c^4 , provided in the needle-bar, it reaches the needle, Figs. 1 and 3.

We claim as our invention—

10 1. A sewing machine for braiding or cord-
ing, provided with a needle bar jointed at two
places whereby the middle portion forms a
link, a presser-foot movable in all directions, a
crank handle and connections for moving the
15 presser-foot, in combination with a thruster
adapted to move laterally only and having a
vertical opening for the passage of the lower
part of the needle bar, and means for reciprocating the thruster, whereby when executing
20 a zigzag line of sewing the needle always remains at right angles to the fabric, substantially as set forth.

2. A sewing machine for braiding or cord-

ing, provided with a needle bar jointed at two
places whereby the middle portion forms a 25
link, a presser-foot movable in all directions,
a crank handle and connections for moving
the same, a thruster provided with a vertical
opening for the passage of the lowest part of
the needle bar, and connections between the 30
main driving spindle of the machine and the
thruster adapted to impart a laterally reciprocating motion to the said thruster, the said
connections being adjustable for altering the
length of movement of the thruster and also 35
for preventing the lateral movement of the
thruster, substantially as set forth.

In testimony whereof we have signed our
names to this specification in the presence of
two subscribing witnesses. 40

JOHANNES HAAS.
RICHARD LINTZ.

Witnesses:

RICHARD SCHMIDT,
ROBERT MICHALSKY.