

No. 697,270.

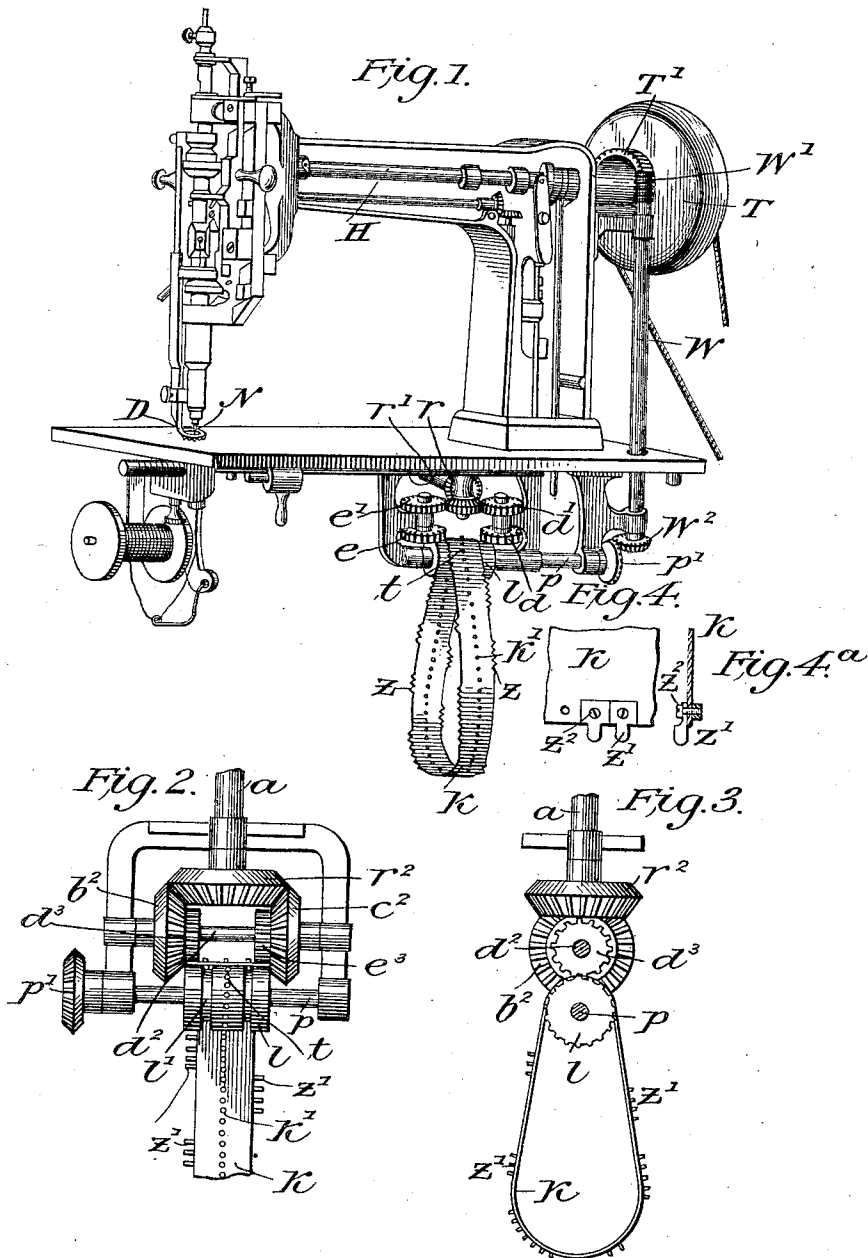
Patented Apr. 8, 1902.

D. NADEL.

PATTERN MECHANISM FOR EMBROIDERING MACHINES.

(Application filed Jan. 2, 1900.)

(No Model.)



Witnesses:

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PATTERN MECHANISM FOR EMBROIDERING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 697,270, dated April 8, 1902.

Application filed January 2, 1900. Serial No. 136. (No model.)

To all whom it may concern:

Be it known that I, DAVID NADEL, a subject of the King of Prussia, German Emperor, residing at Berlin, in the Kingdom of Prussia, German Empire, have invented certain new and useful Improvements in Pattern Mechanism for Embroidering-Machines or the Like, of which the following is a specification.

The present invention relates to sewing-machines for embroidering, braiding, and like purposes with crank mechanism. In such machines, as is well known, the pattern is formed with the aid of a presser-foot, which feeds the fabric on which the pattern is to appear in any desired direction, whereby the needle, which works vertically up and down, can stitch the design required. The presser-foot receives a reciprocating motion from the main shaft of the machine, while rotary motion around the vertical axis is imparted by the crank-shaft. The direction of the feed has naturally to be changed according to the particular design which is to be embroidered, so that the crank mechanism must be rotated sometimes to the left and sometimes to the right, just as may be required. This has proved to be a matter of serious inconvenience when the pattern is formed automatically by means of a pattern-drum, cam-disk, endless band, or like device, since the latter always rotates in the same direction.

It is the object of the present invention to overcome this drawback by providing a reversing-gear whereby the direction of motion of the crank mechanism may be changed automatically.

The invention is illustrated by the accompanying drawings, on which—

Figure 1 shows a perspective view of a portion of a sewing-machine of known construction to which the new device forming the subject of the present invention is applied. Fig. 2 shows a back view of a modified form of the device. Fig. 3 is a cross-section of the parts shown in Fig. 2 as seen from the right-hand side. Figs. 4 and 4^a show by face view and cross-section, respectively, a portion of the pattern-band which may be employed with removable teeth.

Referring to Fig. 1, H is the main shaft of a sewing-machine of well-known construction to which the new device is applied. On the

shaft H is mounted the driving-pulley T, which is formed with a worm-wheel T', engaging with a worm W', provided on the upper end of the shaft W, carried in vertical bearings. At the lower end of the shaft W is a bevel-wheel W², meshing with a similar bevel-wheel p', mounted on a horizontal shaft p, carried in suitable bearings under the machine-table. The horizontal shaft p also has mounted upon it a cylinder l, over which is passed an endless band k for automatically producing the pattern, as will be described. Above the cylinder l are two short vertical shafts or pivots carrying below and above toothed wheels ee' and dd', the upper of which, e' and d', engage with a toothed wheel r, mounted on a shaft or pin. The wheel r gears into another toothed wheel r', mounted on a shaft which forms a part of the crank mechanism. It may be the crank-shaft itself, the needle-tube, or other part, or it may be a special shaft in gear with the crank mechanism. When now the pulley T rotates, the gear T' W' drives the shaft W, which by means of the gear W² p' rotates the shaft p, carrying the cylinder l and pattern-band k. The former is provided with projections or pins l, which engage with a line of corresponding holes k' along the middle of the pattern-band k, and thereby rotate it. This band is also provided on either side with teeth z, these teeth being arranged in sets corresponding with the pattern which it is desired to embroider. In rotating the teeth z on the left-hand side of the band will mesh with the teeth of the wheel e and will rotate it, whereby the wheel e', mounted on the same shaft, will rotate the wheel r, which, gearing into the wheel r', will transmit the motion in well-known manner to the fabric-feeding foot of the machine. When the teeth z on the left-hand side have passed the wheel e and other teeth z on the right-hand side come into engagement with the wheel d, the wheel d' will rotate the wheel r, but in opposite direction to the motion imparted by the wheel e'. Thus the motion transmitted by the wheel r to the fabric-feeder will be this time the reverse of the previously-transmitted motion. While, therefore, the shaft p always rotates in the same direction, the shaft operated by the wheel r is automatic-

ally given an alternating direction of rotation to the right or to the left, just as may be desired for the particular pattern to be worked.

- 5 It is clear that the details of the mechanism may be greatly varied without departing from the essential feature of the invention. Fig. 2 shows one such modified form of construction. Instead of the toothed wheels e e' 10 d d' , Fig. 1, mounted on vertical shafts, a horizontal shaft d^2 is provided, carrying toothed wheels d^3 e^3 , with beveled parts b^2 c^2 gearing with the wheel r^2 , which is shown as a bevel-wheel mounted on its shaft a , which represents a part of the crank mechanism or a part 15 operating the same, as already described in reference to the parts r r' , Fig. 1. Instead of the teeth z , Fig. 1, the band k is shown in Fig. 2 as having another form of tooth z' , 20 which teeth mesh with the wheels d^3 e^3 . These teeth may be permanently affixed to the pattern-band; but it is convenient to employ adjustable teeth, so that the same band may be used for a number of patterns, the teeth being rearranged each time, as required. Figs. 4 25 and 4^a show such an arrangement of removable teeth z' , secured by screw-bolts z^2 to the material of the band k . Grooves l' , Fig. 2, can then be provided on the cylinder l to receive the nuts of the bolts z^2 . 30

- Instead of a pattern-band another pattern-former—such as a disk, cylinder, or like device—might be employed, and instead of projecting teeth, as shown, the lateral wheels 35 might engage with pins or the like formed on or in such device. In place of teeth on each side of a single pattern-former the latter may be a composite body composed of two parts, each having teeth only on one side. These 40 parts might then be rotated by a third part, rotating with the same or a different velocity. It will also be obvious that although on the drawings the device is shown applied below

the machine-table it might equally well be arranged above the latter without any material 45 difference in the construction of the parts.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an embroidering-machine, the combination of a universal feed mechanism, a 50 crank mechanism for controlling the direction of the feed, and pattern mechanism operating on said crank mechanism, comprising a pattern-former rotated in suitable manner, provided with two sets of gearing means, 55 intermediate reversing-gear operated by said sets of gearing on the pattern-former, and gearing driven by said reversing-gear and transmitting its motion to the crank, whereby an automatic reversal of the direction of rotation of said crank is effected at desired intervals, all substantially as and for the purpose set forth. 60

2. In an embroidering-machine, the combination of a universal feed mechanism, a 65 crank mechanism for controlling the direction of the feed, and pattern mechanism operating on said crank mechanism, comprising a pattern-former rotated by suitable gearing from the main shaft of the machine, and 70 provided with two lateral sets of teeth, toothed gears each operated by only one set of the teeth, and gearing actuating the crank and mounted intermediately of said toothed gears 75 and meshing with both, so as to be rotated alternately in opposite directions, according as one or other set of pattern-former teeth come into operation, substantially as and for the purpose set forth. 80

In witness whereof I have hereunto set my hand in presence of two witnesses.

DAVID NADEL.

Witnesses:

HEINRICH FITTE,
WOLDEMAR HAUPT.