

C. KELLER.
EMBROIDERY PATTERN MACHINE.
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1,130,172.

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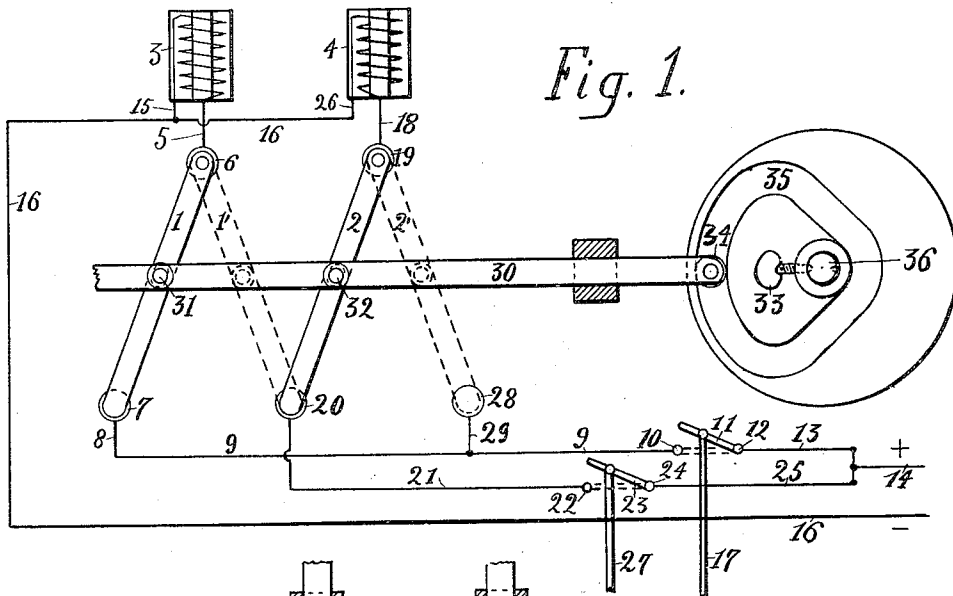
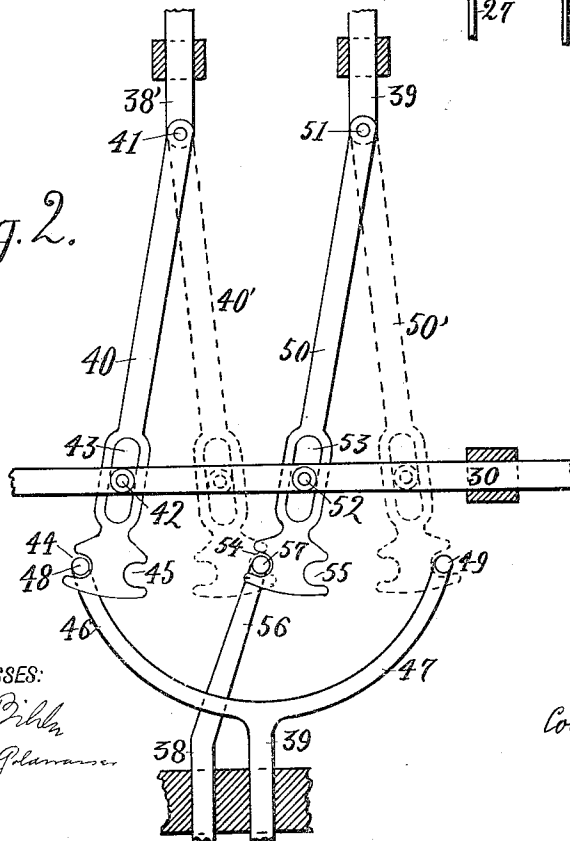


Fig. 2.



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EMBROIDERY-PATTERN MACHINE.

1,130,172.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CONRAD KELLER, a citizen of the Republic of Switzerland, residing at Weehawken, in the county of Hudson and State of New Jersey, have invented a new and useful Improvement in Embroidery-Pattern Machines, of which the following is a specification.

The purpose of my invention is to adopt the embroidery-pattern machine to produce patterns suitable for double-action embroidering machine jacquards, *i. e.*, such jacquards which move the embroidery frame not only by their forward movements, but also by their return movements. Frame moving mechanisms of this type when using an ordinary pattern would, as their movement is a back and forth movement, move the embroidery-frame, every alternate cycle, in a direction contrary to the one prearranged on the pattern. To prevent such occurrences, means have been provided in the pattern producing machine to automatically adapt the pattern to these conditions.

In the accompanying drawing: Figure 1 is a plan of an electrical device for the purpose named and Fig. 2 is a mechanical contrivance for the same purpose.

In an embroidery pattern machine there are selective punches and punch selectors adapted to perforate the pattern which is destined to govern the length and direction of the movements which must be imparted to the embroidery frame of the embroidery machine. There may be separate punches to govern the directions of the movements and separate punches to indicate the lengths of the movements or there may be a combination of punches controlling the extent of the movements and at the same time the directions of these movements. In the first case, my invention may be used in connection with the direction punches and in the second case in connection with the embroidery frame controlling punches. I obtain the desired results by combining in pairs such punches which govern opposite directions of movements or such punches which control the same extent of movements in opposite directions, and by alternately reversing or exchanging the direction controlling means between the members of each of such pairs of punches.

The electrical device Fig. 1 is used on punching machines wherein the punches are

controlled by electrical means, such as magnets, and consists of a number of pairs of single knife switches, 1, 2, being members of a pair corresponding to one of the number of the said pairs of punches in the punching machine. The magnets 3 and 4 are each one separately operating in a known way one punch of a pair of punches as mentioned above. The positive wire 5 of magnet 3 leads to the switch terminal 6. To this terminal 6 the switch blade 1 is movably connected and makes a sliding contact with the contact button 7. A wire 8 leads from contact button 7 to the wire 9 which is soldered to contact button 10. A spring switch 11 may connect the button 10 with the button 12 to which the wire 13 is attached, the latter making connection with the source of current by means of the conductor 14. The negative wire 15 of the magnet 3 is connected to the main return wire 16. The switch 11 is operated by a known selecting mechanism of the pattern machine which controls its opening and closing by means of the rod 17. Magnet 4 is similarly connected to the conductor 14, namely by wire 18, switch terminal 19, switch blade 2, button 20, wire 21, button 22, switch 23, button 24 and wire 25. The return wire 26 of the magnet 4 also joins the common return wire 16 and the switch 23 also is operated by a known selecting mechanism through rod 27. There is a third contact button 28 from which leads the wire 29 to wire 9 the same to which is connected wire 8 and button 7. The switch blades 1 and 2 are both movably joined to an electrically non-conducting, intermittently oscillating bar 30 by means of the pins 31 and 32 respectively. Upon the bar 30 there is mounted an antifriction roller 34 which runs in a cam groove 35 and causes the oscillating movements of the bar 30. One half turn of the cam 35 causes the blades 1 and 2 to swing over into the position shown by 1' and 2', the blade 1 thereby breaks the contact with button 7 and connects itself with the button 20, while the blade 2 leaves the button 20 and makes contact with the button 28. This shifting of the blades will guide the current that energized magnet 3 in the former position, to magnet 4 and energizes the latter instead of the former. Similarly magnet 4 is now energized by the current that energized magnet 3 in the former position of the blades 1' and 2'. A further half

turn of the cam 35 resets the switches 1' and 2' into the position 1 and 2 with the effect that the magnets are energized as stated at first. The cam 35 is geared to the pattern-machine to make one cycle for every two cycles of the pattern-machine and is thus counteracting the reversing effect of an embroidery frame moving mechanism which works backward every second embroidery frame movement, by reversing the direction indicated by the punches which are controlled through the magnets 3 and 4. As the switch rods 17 and 27 are always working the same way, the selecting mechanism of the pattern punching mechanisms is not to be changed. Any number of blades 1 and 2 may be connected to bar 30.

Fig. 2 shows my invention executed mechanically for pattern-machines which select the punches by mechanical means. In this case the punch selectors are mostly made in the form of a rod or slide as indicated by the parts 38, 38', and 39, 39' of Fig. 2. Into these slides I insert means to exchange the connection between the slides 38, 38' and 39, 39'. These means consist of a slide 40, movably joined at one end to the slide 38' by the pin 41. A pin 42 fitted into the bar 30 serves as a pivot on which the slide 40 may be rotated and as a guide for sliding movements of the slide 40. At the other end the slide 40 is provided with the recesses 44 and 45. The slide 38 is provided with two extensions 46 and 47, which have at their extremities the pins 48 and 49 respectively. The pin 48 is adapted to be engaged by the recess 44. Another slide 50, similar to slide 40, is movably connected at one end to slide 39' by pin 51. A pin 52 upon the bar 30 engages the slot 53 in the slide 50 for turning and guiding purposes. Recesses 54 and 55 are provided at the other end of the slide 50 as shown, the recess 55 being capable of engaging the already mentioned pin 49. Slide 38 has an extension 56 provided with a pin 57 which fits into the recesses 54 and 45.

The bar 30, roller 34, Fig. 1, the cam groove 35 and the shaft 36 are the same as described for the electrical device and are making the same movements.

The action of the device is as follows: The slides 38, 39 are operating upon their respective punches by, for instance, a pushing motion toward the slides 40 and 50 respectively, thereby pushing also the slides 38' and 39' respectively. This may be the arrangement to fit the pattern for a forward stroke of the embroidery-frame moving device on which the pattern is going to be used. Now to reverse the punches controlled by the slides 38 and 39, the cam 35, while making half a rotation, is shifting the slides 40 and 50 to the right. This brings the pin 48 out of engagement with the recess

44, and the pin 57 out of engagement with the recess 54 and it engages recess 45. The pin 49 now is engaged by the recess 55. This action sets and locks the said pins and the slides in an interchanged position. It will thus be seen that a movement made by the slide 38 will be transmitted to slide 39 by means of slide 50 instead of to slide 38' as before, and the slide 39 will similarly control the slide 38' by means of slide 40. A further half rotation of the cam 35 will reset the parts to the first described position and so on alternately, thus compensating the reversing effect on the back and forth working embroidery-frame moving mechanism by reversing the action of the pattern machine correspondingly. To adjust by hand the slides of which 1 and 2, and 40 and 50 are samples, a set screw 33 Fig. 1 is provided to free the cam 35 from the shaft 36 and to allow it to be rotated half a turn by hand.

The device described is preferably used in the pattern punching machine, but it could be set into the frame moving mechanism in a similar manner in which it is used in the pattern punching machine. In this case it is not necessary to have it in the pattern punching machine.

In the pattern punching mechanism the described reversing device is inserted between the design reading device and the punching mechanism, while in the embroidery frame moving device it is inserted between the pattern reading mechanism and the movement executing mechanism. The latter mentioned use of my device I consider included in my invention, as I especially refer to pattern punching machines only for the reason that one of the latter machines will supply a number of embroidery frame moving machines with patterns and therefore a larger number of my present devices will be needed if they were set in the embroidery frame controlling machine.

What I claim and desire to secure by Letters Patent is:

1. In an embroidery-pattern machine, in combination, selective punches and punch selecting means, connections from the said punch selecting means to the said selective punches and means to interchange the said connections in their relation to the said selective punches and the said punch selecting means.

2. In an embroidery-pattern machine, in combination, a pair of selective punches and a pair of punch selecting means and intervening means between the members of the said pair of selective punches and the members of the said pair of punch selecting means, the said intervening means being interchangeable in their relation to the members of the said pair of selective punches

and the members of the said pair of punch selecting means.

3. In an embroidery-pattern machine, in combination, a plurality of pairs of selective punches and a plurality of pairs of punch selecting means and intervening means between the members of the said pairs of selective punches and the members of the corresponding pairs of the said pairs of punch selecting means, the said intervening means being interchangeable in their relation to the members of the said pairs of selective punches and the members of the corresponding pairs of the said punch selecting means.

4. In an embroidery pattern machine, in combination, selective punches, punch selecting means therefor, intervening pole-changing switches adapted to control said selective punches by the punch selecting means, a cam to control the operation of said pole-changing switches and intervening electrical connections for the purposes named.

5. In an embroidery pattern machine in combination, selective punches and punch selecting means therefor intervening electrical means to control the said selective punches by the punch selecting means, pole changing switches and means to control the said pole changing switches for the purpose named.

6. In an embroidery-pattern machine, the combination of interlocking slides, capable

of transmitting motion and adapted to interchange the motions transmitted to them, a cam to control the interlocking and interchanging of the said slides and intervening connections between the said slides and the said controlling cam.

7. In an embroidery pattern machine, in combination, selective punches and punch selecting means therefor, intervening interlocking slides to control the said selective punches by the punch selecting means and means to control the said interlocking slides.

8. In an embroidery pattern machine, in combination, selective punches, punch selecting means therefor, intervening and interlocking slides to control the said selective punches by the punch selecting means and a cam shaft adapted to counteract the reversing effect of the embroidery frame.

9. In an embroidery pattern machine, in combination, selective punches, punch selecting means, connections from said punch selecting means to said selective punches, and means for automatically reversing the directions of movements controlled by the pattern.

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Witnesses:

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