

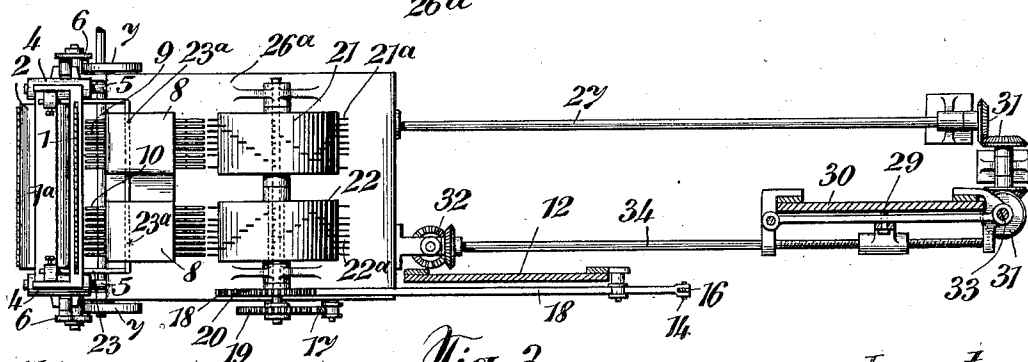
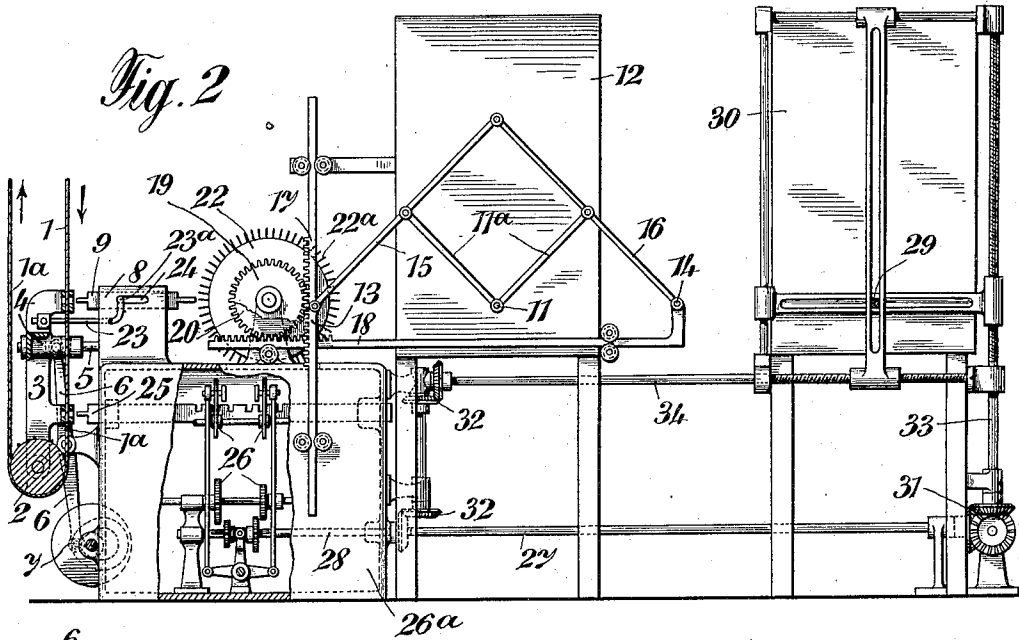
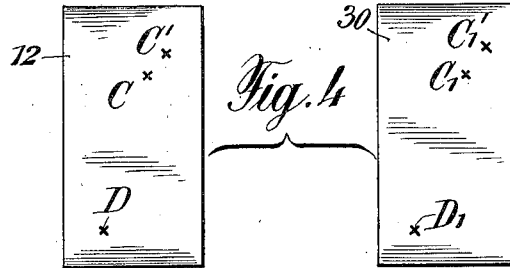
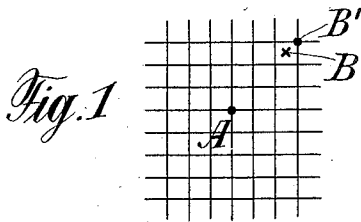
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APPARATUS FOR PRODUCING JACQUARD CARDS FOR AUTOMATIC EMBROIDERING MACHINES.
APPLICATION FILED NOV. 4, 1911.

1,057,581.

Patented Apr. 1, 1913.

2 SHEETS—SHEET 1.



Witnesses:

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APPARATUS FOR PRODUCING JACQUARD CARDS FOR AUTOMATIC EMBROIDERING MACHINES.

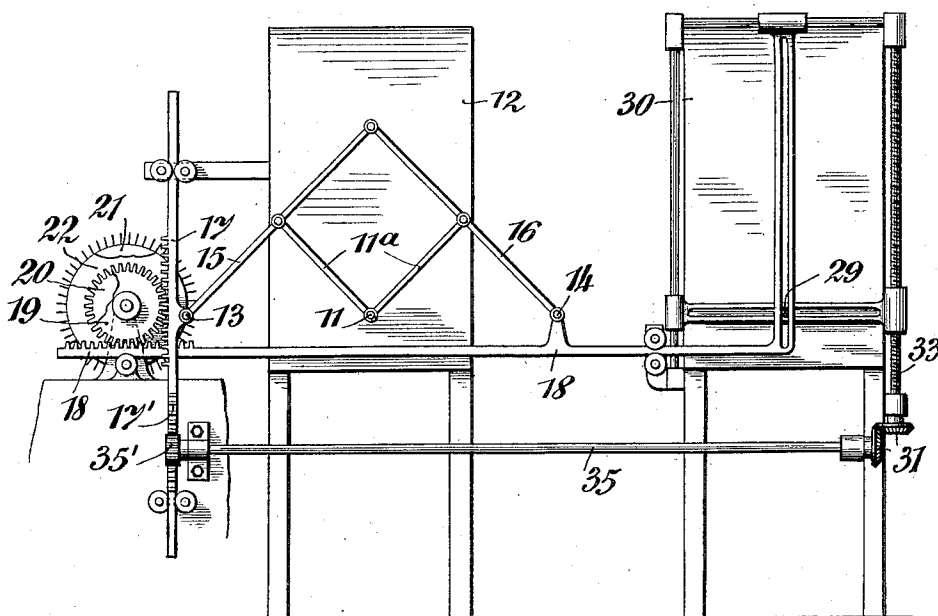
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2 SHEETS—SHEET 2.

Fig. 5



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UNITED STATES PATENT OFFICE.

HIPPOLYT SAURER, OF ARBON, SWITZERLAND.

APPARATUS FOR PRODUCING JACQUARD-CARDS FOR AUTOMATIC EMBROIDERING-MACHINES.

1,057,581.

Specification of Letters Patent.

Patented Apr. 1, 1913.

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To all whom it may concern:

Be it known that I, HIPPOLYT SAURER, a citizen of the Republic of Switzerland, residing at Arbon, Switzerland, have invented new and useful Improvements in Apparatus for Producing Jacquard-Cards for Automatic Embroidering-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

If an embroidery pattern or one stitch of such pattern is produced by an automatic mechanism by means of a jacquard card it happens with all constructions that the stitches are not produced by the automatic mechanism as mathematically exact as desired, but only approximately, in consequence of the play in the connecting mechanism and because, with most of the constructions, the errors in said components in the two directions will not compensate one another but will cumulate.

In the accompanying drawings:—Figure 1 is a diagram illustrating the method of operation. Fig. 2 is a side elevation of one form of apparatus embodying my invention. Fig. 3 is a plan view of the same. Fig. 4 shows the pattern boards, and Fig. 5 is a side elevation of a modified form of apparatus.

As illustrated in Fig. 1 stitches can only be produced from the point A to the points of intersection of the vertical and horizontal lines. Instead of a prescribed stitch, as from A to B for instance, the automatic mechanism would produce a stitch from A to B' for instance. The difference B B' can be reduced by a fine gradation to so small an amount, that it is not considerable for a single stitch. But if it should happen that many of these differences do not compensate but are added to each other, it is possible that the sum of the differences B B' represents a total inaccuracy which must be corrected to obtain a satisfactory embroidery. Differences of the size of B B' could

also be produced by a play in the connections. Hitherto the mistakes have been ascertained by making a useless, unsalable embroidery, which was produced either by hand or automatically after perforating the jacquard card, whereafter the thus completed card was re-perforated. According to this invention contemporary with perforating the card the total mistake is always mechanically rendered visible without producing a control embroidery and is corrected during the perforation.

The strip shaped jacquard card 1 is guided by a pulley 2 and impelled by suitable means in the direction of the arrows shown in Fig. 2. The pulley 2 is carried by an arm 3 secured to a slide 4, which is horizontally displaced to and fro on a guide 5 in the direction at right angles to the jacquard card by means of a double armed lever 6 connected to a crank 7. In front of the jacquard card 1 are arranged two groups of punches 9, 10, the punches being singly horizontally movable in a guide 8. By displacing the slide 4 and the pulley 2 by means of the crank 7 the jacquard card is moved toward the punches.

A motion of the pin 11 of the pantograph 11^a arranged in front of the pattern board 12 of the perforating apparatus is converted by gear mechanism into two components. For this purpose the ends 13 and 14 of the arms 15 and 16 of the pantograph are pivoted to gear racks 17 and 18. The rack 17 is guided vertically in a straight fixed course and engages a toothed wheel 19 which is secured to the shaft of a cylinder 21 of the perforating device. This cylinder is employed for producing the perforations in the jacquard card for the vertical component. The rack 18 is guided horizontally in a straight fixed course and engages a toothed wheel 20 secured to the shaft of another cylinder 22 which is employed for producing the horizontal component. The shafts of the cylinders 21 and 22 are coaxially arranged one around the other. To the surface of the cylinders 21 and 22 are secured pins 21^a and 22^a which are arranged in the well known manner in rows corresponding with the punches 9, 10 and in different

groups, each group corresponding to a certain position of the pin 11 of the pantograph. If the jacquard card is moved by means of the crank 7 against the punches 9, 10, those punches which are not backed by pins 21^a and 22^a will be pushed backward, while the remaining punches are caused to perforate the card, the punches 9 producing the perforations for the vertical component and the punches 10 the perforations for the horizontal component. To the slide 4 is connected a U-shaped rod 23. All punches 9, 10 are provided with a slot 24, through which passes the central part 23^a of the rod 23, so that the punches which have been pushed backward before are caused to be drawn forward again when the slide 4 is moved in this direction by the crank 7.

The perforated portion 1^a of the jacquard card acts on the blades 25 of the jacquard apparatus 26 inclosed in a box 26^a.

27 and 28 are the shafts of the jacquard apparatus from which the vertical component is transmitted by means of gears 31 and a spindle 33 and the horizontal component by means of gears 32 and a spindle 34 to the pin 29 arranged in front of a control pattern board 30.

In the apparatus illustrated in Fig. 5 the motions corresponding with the perforated portion of the jacquard card are directly transmitted from the perforating device to the control pin omitting thus the jacquard card and the automatic mechanism. The arrangement of the pantograph 11^a and its connection with the cylinders 21, 22 of the perforating device is the same as with the device shown in Figs. 2 and 3. The horizontal component is transmitted directly from the rack 18 to the pin 29 of the control pattern board. The rack 17 is provided at its lower end with teeth 17' engaging a toothed wheel 35' secured to a shaft 35 which transmits the vertical movements to the pin 29 by means of gears 31 and a spindle 33. With the device according to Fig. 5 only those mistakes can be corrected which result as a consequence of the play in the connecting mechanisms.

In Fig. 4 the pattern boards 12 and 30 are shown in a reduced scale. If the pin 11 is at the point C (Fig. 4) of the pattern board 12 of the perforating device the pin 29 of the control pattern board 30 ought to be in the point C₁. In consequence of the inaccuracy mentioned, the stylus 29 of the control pattern board will not be at C₁ but at some other point, C₁'. Now if the next stitch is to be made to D, the control stylus 29 should arrive at D₁ but will not do so, as the distance C—D is less than C₁'—D₁, and a correction must be made so that 29 will arrive at D₁. For correcting this the pin 11 is disconnected from the control pantograph, for example, by loosening wheels 19

and 20 from their respective shafts, and the pin 11 is then moved to C' corresponding to the position C₁', the wheels 19 and 20 are again secured to their shafts and the new stitch indicated by pin 11 from C' to D will cause the control pin 29 to arrive at D₁ and the cumulated error will be eliminated. This is repeated as soon as cumulated errors again indicated on the control pattern board are of such extent as require another correction.

The reproduction of the motions on the control pattern can also be performed proportionally in a larger scale than they would be transmitted to the embroidery work frame for instance by applying a suitable ratio of gearing of the bevel wheel of the jacquard apparatus or by a suitable pitch of the transmitting spindles.

What I claim is:

1. In an apparatus for producing jacquard cards for embroidering machines, in combination, stitch measuring mechanism, punching mechanism, having selecting means controlled thereby and cooperating means for portraying the stitch, operated by the punched card, thereby indicating the necessary correction.

2. In an apparatus for producing jacquard cards for embroidering machines, in combination, stitch measuring mechanism, punching mechanism having selecting means controlled thereby and cooperating means for portraying the stitch on an enlarged scale, operated by the punched card, thereby indicating the necessary correction.

3. In an apparatus for producing jacquard cards for automatic embroidering machines in combination, stitch measuring mechanism, punching mechanism having selecting means controlled thereby, means to permit the alteration of the relation of the stitch measuring and of the selecting mechanisms and cooperating means actuated by one portion of the card simultaneously with the punching of another portion of the card for portraying the stitch on an enlarged scale, thereby indicating the correction necessary.

4. In apparatus for producing jacquard cards for embroidering machines in combination, a pantograph for measuring stitches, punching mechanism having selecting means controlled by the pantograph, means to permit the alteration of the relation of the pantograph and selecting means, a jacquard apparatus cooperating with the card during its punching operation, and mechanism operated by the jacquard apparatus for portraying the stitch on an enlarged scale, thereby indicating the correction necessary.

5. In apparatus for producing jacquard cards for embroidering machines, in combination, a pantograph for measuring stitches, punching mechanism having select-

ing means controlled by the pantograph, co-
operating jacquard apparatus operated by
the punched card, and a pantograph oper-
ated by the jacquard apparatus portraying
5 the stitch on an enlarged scale, thereby indi-
cating the necessary correction.

In testimony that I claim the foregoing as

my invention, I have signed my name in
presence of two subscribing witnesses.

HIPPOLYT SAURER.

Witnesses:

EUGENE NABEL,
ALBERT PHILLIPS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."