

K. EGGART.
 AUTOMATIC EMBROIDERING MACHINE.
 APPLICATION FILED MAR. 12, 1913.

1,069,640.

Patented Aug. 5, 1913.

2 SHEETS—SHEET 1.

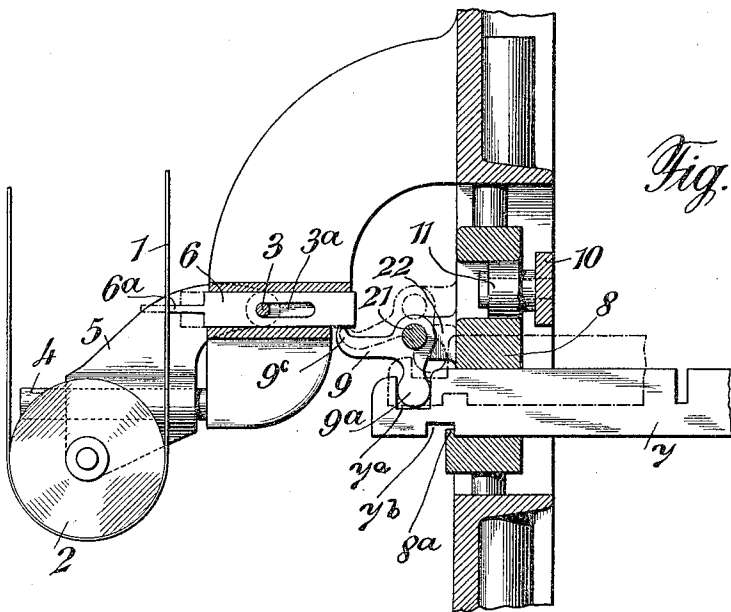


Fig. 1

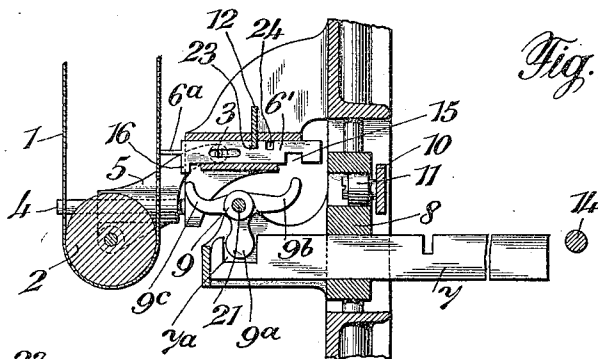


Fig. 2

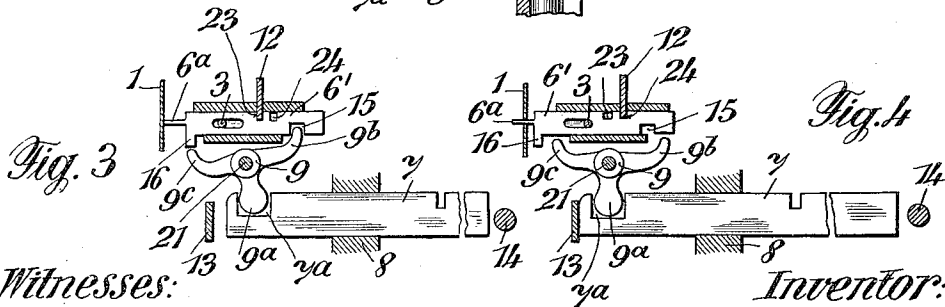


Fig. 3

Fig. 4

Witnesses:

B. Romm
E. Leckert

Inventor:

Karl Eggart
 By *Henry J. [Signature]* atty.

K. EGGART.
 AUTOMATIC EMBROIDERING MACHINE.
 APPLICATION FILED MAR. 12, 1913.

1,069,640.

Patented Aug. 5, 1913.

2 SHEETS—SHEET 2.

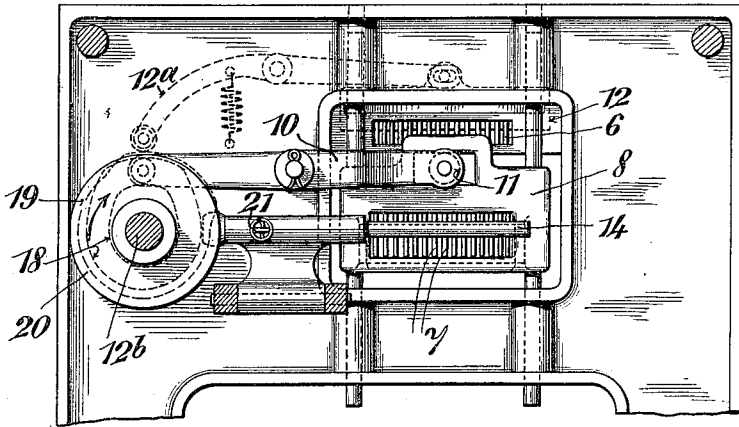


Fig. 5

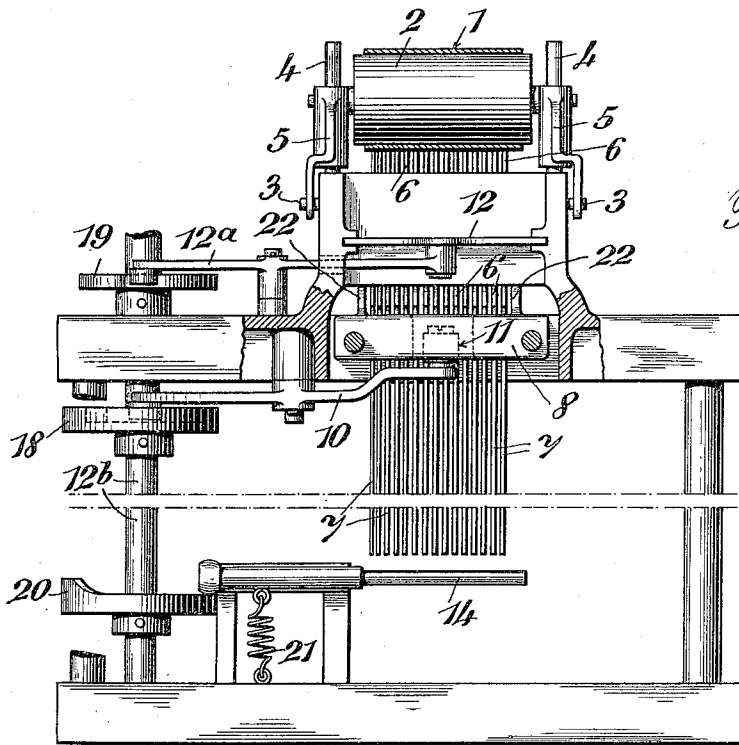


Fig. 6

Witnesses:

C. Rommure
E. Leckert.

Inventor:

Karl Eggart
 By *Henry Orth* atty.

UNITED STATES PATENT OFFICE.

KARL EGGART, OF ARBON, SWITZERLAND, ASSIGNOR TO THE FIRM OF ADOLPH SAURER, OF ARBON, SWITZERLAND.

AUTOMATIC EMBROIDERING-MACHINE.

1,069,640.

Specification of Letters Patent.

Patented Aug. 5, 1913.

Original application filed August 6, 1912, Serial No. 713,597. Divided and this application filed March 12, 1913. Serial No. 753,779.

To all whom it may concern:

Be it known that I, KARL EGGART, a citizen of the Republic of Switzerland, and a resident of Arbon, Switzerland, have invented certain new and useful Improvements in 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.

This application is a division of my application filed August 6th, 1912, Serial No. 713,597.

In automatic embroidering machines as hitherto constructed the needles which are not in front of a hole in the jacquard card are displaced by the relative movement between the jacquard card and a member carrying the needles or the needle bars, whereby pressure is transmitted from the jacquard card by means of the needle bars to the blades which cause the adjustment of the automatic mechanism.

The terms "blades" and "pushing blades" comprise all such members which in a well known manner, according to the perforations of the pattern card, produce motions of different amplitudes in the automatic mechanism, which motions are transmitted to the embroidering frame, as described in United States Patent No. 1,059,880, dated April 22, 1913. The pressure or counter-pressure of the card actuates in this manner the needle bars as well as the blades. On the contrary, according to this invention the pressure or counter-pressure of the card actuates the needles only, and is not transmitted to the blades, which are displaced as usual according to the displacement of the needles, but by separate means. By operating the card in such a manner, among other advantages, a construction can be obtained in which the displacement of the needles takes place at another time than the displacement of the blades.

As with other automatic embroidering machines also in the present construction adjacent blades are separately displaced, while the unmoved blades are constrained to remain in their position of rest. In practice

the drawback occurs that by shakes, friction, wearing and the like, wrong blades are unintentionally moved with others. In order to overcome this drawback in known constructions of automatic embroidering machines special arresting means are provided which are separately impelled. In the construction according to this invention the means which make it possible to displace the blades independently from the jacquard card, are simultaneously used to secure the blades against unintentional movement. In this manner the use of special arresting means is avoided.

In the structure embodying my invention the needle bars are selectively operated by the card, and the blades are subsequently indirectly operated from the bars by means of bell-crank levers having two or three arms, one or two of said arms acting in conjunction with surfaces or projections on the needle bars, which surfaces or projections perform the functions of arms to move the bell-crank levers and cause them to shift the blades.

Referring to the drawings illustrating two forms of mechanism embodying my invention, and in which like parts are similarly designated, Figure 1 is a partial view of so much of a jacquard mechanism as will be necessary for an understanding of my invention, parts thereof being shown in elevation and parts in vertical section. Fig. 2 is a similar view of a modification. Figs. 3 and 4 are views similar to Fig. 2, illustrating parts in different positions. Fig. 5 is a side elevation of parts of a jacquard apparatus, and Fig. 6 is a plan view of Fig. 5.

Referring to the mechanism illustrated in Fig. 1, the perforated jacquard card 1 travels around a drum 2, and is progressed by well known means. The jacquard card drum 2, together with a pin 3, hereinafter described, are mounted on a slide 5 that is horizontally movable on stationary slide ways 4. The slide 5 may be impelled by any suitable mechanism, for example, by the mechanism shown and described in United States Patent No. 1,057,581, dated April 1, 1913. The needle bars 6 carry at their forward ends needles 6^a directed perpendicular to a portion of the card 1. The needle bars 6 are provided with slots 3^a through which passes the pin 3 whose func-

tion is to return all the needle bars to the left or inoperative position when the slide 5 is moved to the left in its inoperative position. The jacquard blades 7 are mounted to slide longitudinally in a frame 8 and are provided on their lower edges with a wide notch 7^b into which projects a narrow rib or flange 8^a on the frame. This notch 7^b and flange 8^a limit the longitudinal movements of the blades and more especially insure their proper end positions. The ends of the blades 7 projecting beyond the frame 8 are provided with notches 7^a. Just above these projecting ends of the jacquard blades is a shaft 21 supported at each end in brackets 22 projecting from the frame 8. Loose on this shaft 21 are means for indirectly operating the blades 7 from their respective needle bars 6, which means comprises a bell-crank lever 9 between each blade 7 and its controlling needle-bar 6. This bell-crank lever has a downwardly directed arm 9^a having a rounded end that fits in the notch 7^a and an arm substantially at right angles thereto having an up-turned end 9^c arranged to engage the rear end of the pertaining needle-bar 6. The frame 8 is vertically reciprocated by means of a double-armed lever 10, Figs. 5 and 6, that is rocked by a cam 18 mounted on a shaft 12^b and that engages the frame 8 by means of a roller 11. The shaft 12^b is rotated by any suitable means, not shown. The needle-bars 6 can be displaced by the card 1 horizontally, but not vertically.

The operation is as follows: When the slide 5 is moved to the right it carries the card 1, the drum 2 and pin 3, and if there is no perforation in front of the needle 6^a, the needle bar is also displaced to the right by the card, from the position shown in dotted lines Fig. 1, to the position shown in full lines. The frame 8 is then moved upward and the up-turned end 9^c of the bell-crank lever 9 abuts against the rear end of the needle-bar 6, and by a further upward movement this bell-crank lever is turned on the shaft 21 to move its blade 7 into working position, as shown in dotted lines. Thereafter the frame 8 is moved downward, the slide 5 together with the card 1 and drum 2 returns to the left and the pin 3 returns all the selected needle bars and needles to their normal or zero position ready for the next selecting operation. If, however, there is a perforation in the card 1 in front of the needle 6^a when the card moves to the right, the needle passes through the perforation and the needle-bar is not displaced. Then when the frame 8 moves upward the up-turned end 9^c of the bell-crank lever 9 does not touch the rear end of the needle-bar 6, but moves up past the rear end of the needle-bar, so that the blade 7 remains in its normal position.

In the construction according to this invention the displacement of the light needle-bar 6 may begin at the moment in which the frame 8 and the blades 7 begin their downward movement of the preceding working phase, while in the constructions heretofore known the needle-bars could not be displaced before the blades 7 were moved back into their normal positions. By separating the adjustment of the needles from the adjustment of the blades, it is possible to adjust firstly the needles during the working period of the blades, so that the time hitherto required for adjusting the needles may be used for producing other movements. This is of great advantage for a smooth motion of the automatic mechanism. Another advantage of the separation of the adjustment of the needles from the adjustments of the blades is the saving of the card, which in the hitherto known constructions became damaged and useless in a short time by the repeated blows on the ends of heavily connected needles and blades.

In the modification shown in Figs. 2-4 the bell-crank lever 9 is provided with an additional arm 9^b having an upturned end, and is preferably symmetrical with the arm 9^c. The needle blades 6' on their upper edges are provided with two notches 23 and 24 so arranged that when the slides are in either operative or inoperative position, a locking slide 12 may enter the notches that are positioned beneath it and lock both the selected and unselected needle-bars in position. Each needle-bar is provided at its rear on its lower edge with a notch 15, and at its forward end with a depending projection or lug 16. The jacquard blades 7 are arranged to engage a forward stop 13 that prevents the blades from moving too far forward, while a member 14 is horizontally reciprocated against the action of a spring 21 by means of a cam 20, Figs. 5 and 6, on the shaft 12^b for returning the selected blades to normal position. The frame 8 is vertically reciprocated in the same manner as described with reference to Fig. 1. When the card is moved against the needles 6^a those needles that are not opposite a perforation in the card are moved with their needle-bars 6' to the right, Fig. 2, after which the locking slide 12 locks all the blades. The frame 8 is then moved upward, Fig. 3, the lug 16 of the selected needle-bar 6' being then in the path of the upturned end of the arm 9^c of the double bell-crank lever 9. In order to permit the required rotation or rocking of the bell-crank lever on the shaft 21, the symmetrically arranged arm 9^b of the bell-crank lever 9 will enter the notch 15, and blade 7 will be moved to the position shown in Fig. 3. If the needle-bar 6' has not been moved by the card 1, and the needle 6^a passes through

a hole in the card, the needle-bar 6' will be locked in its normal position by the slide 12 entering notch 24. The lug 16 is out of the path of the arm 9^c, and notch 15 is out of the path of the end of arm 9^b, and the end of this arm will abut against the under edge of the rear end of the needle-bar, as shown in Fig. 5, and the blade 7 will be positively held against movement. This positive holding of unselected blades is of great advantage and prevents an unselected blade from being dragged out of its normal position by the friction of an adjacent selected blade.

I claim—

1. In an automatic mechanism for embroidering machines, a jacquard card, needle-bars directly to be moved by laterally moving the jacquard card, blades for transmitting the displacement of the needle-bars to the impelling means of the automatic mechanism, a vertically movable frame carrying the blades, bell-crank levers pivotally mounted on the frame, ends of the levers engaging in the blades, while the other ends of the levers at the upward movement of the frame move against displaced needle-bars.

2. In an automatic mechanism for embroidering machines, a jacquard card, needle-bars directly to be moved by laterally moving the jacquard card, blades for transmitting the displacement of the needle-bars to the impelling means of the automatic mechanism, a vertically movable frame carrying the blades, three-armed levers pivotally mounted on the frame, arms of the levers engaging in the blades, second arms moving against displaced needle-bars at the upward movement of the frame, and third arms of the levers moving against the needle-bars and arresting the blades in their extreme positions.

3. In a jacquard mechanism for embroidering machines, the combination with selectively controlled needle-bars, of blades, end stops for the blades, a reciprocated frame for carrying the blades, and means between the bars and blades and moved into contact with the bars by the movement of the frame to control the blades in accordance with the selection of the needle-bars.

4. In a jacquard mechanism for embroidering machines, the combination with selectively controlled needle-bars; of jacquard blades, a reciprocating frame in which the

blades are mounted, and means between the needle-bars and blades mounted on the frame and moved thereby toward the needle-bars to control the blades in accordance with the selection of the needle-bars.

5. In a jacquard mechanism for embroidering machines, the combination with selectively movable needle-bars; of jacquard blades, a reciprocable frame in which the blades are mounted, and pivoted means between the needle-bars and blades in direct engagement with the blades and moved into engagement with selected needle-bars by the frame to control the selection of the blades in accordance with the selection of the needle-bars.

6. In a jacquard mechanism for embroidering machines, the combination with selectively movable needle-bars; of jacquard blades, a reciprocable frame in which the blades are mounted, bell-crank levers, arms of which are in direct engagement with the blades and arms of which project across the path of selected needle-bars and are moved into contact therewith when the frame is moved.

7. In a jacquard mechanism for embroidering machines, the combination with selectively controlled needle-bars; of blades independent of the needle-bars, a vertically reciprocable frame in which the blades are mounted, bell-crank levers having arms directly engaging the blades, and arms projecting across the path of selected bars and arranged to contact with said selected bars when the frame is moved upward.

8. In a jacquard mechanism for embroidering machines, the combination with selectively operated needle bars each having a projection and a notch; of blades, a vertically movable frame in which the blades are mounted, bell-crank levers carried by the frame each having a downwardly directed arm in engagement with a blade and two additional arms one of which engages said projection and the other of which enters said notch in a selected blade upon the upward movement of the frame.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

KARL EGGART.

Witnesses:

CAMI RICCARDO,
RANDALL ATKINSON.