V. KOBLER.

EMBROIDERY MACHINE JACQUARD APPARATUS.

APPLICATION FILED MAY 6, 1913.

1,107,674.

Patented Aug. 18, 1914.

2 SHEETS—SHEET 1.

Fig. 1

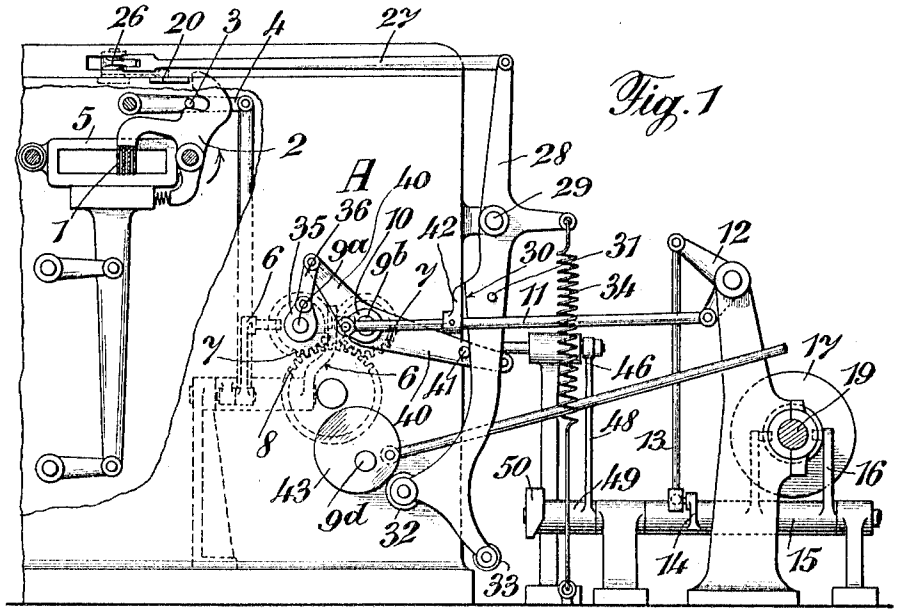

Fig. 2

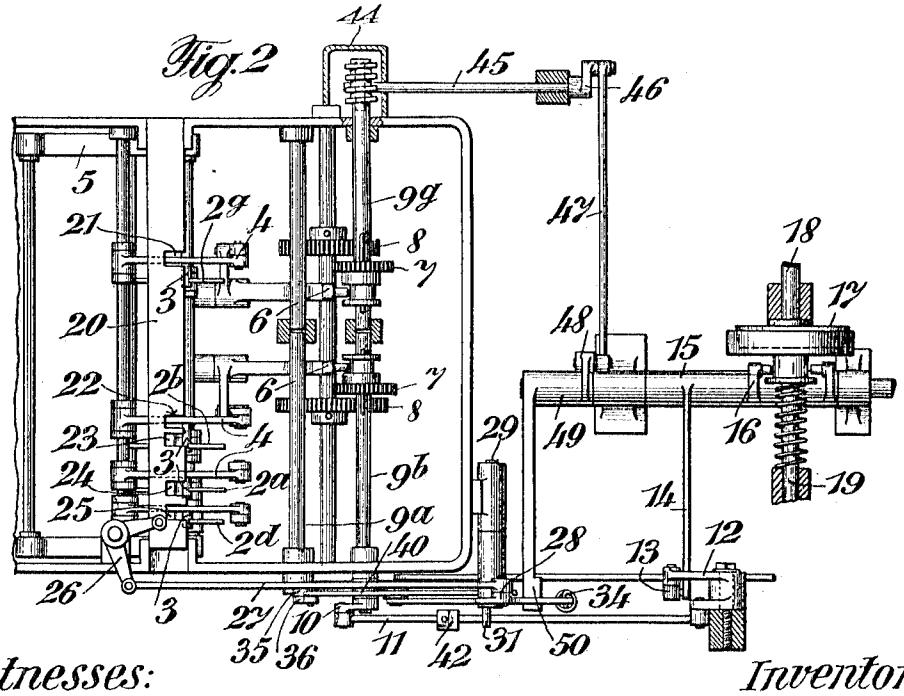

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Fig. 3

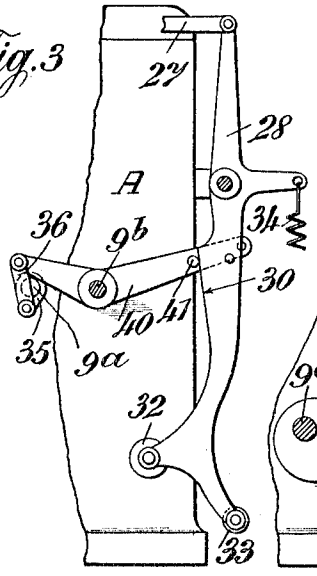


Fig. 4

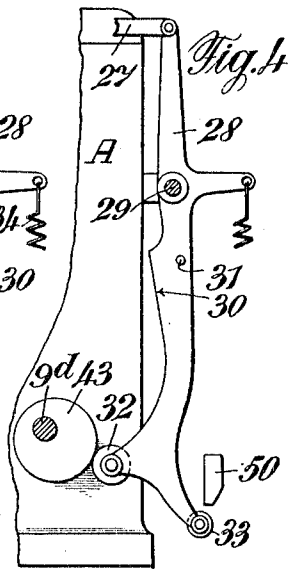


Fig. 5

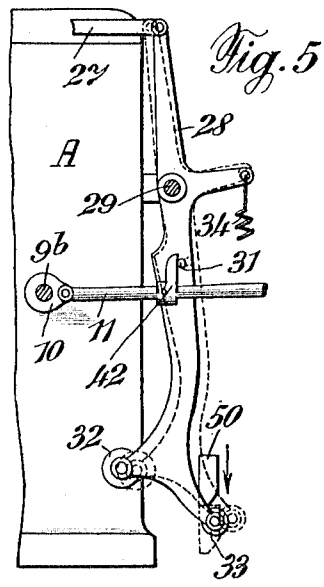
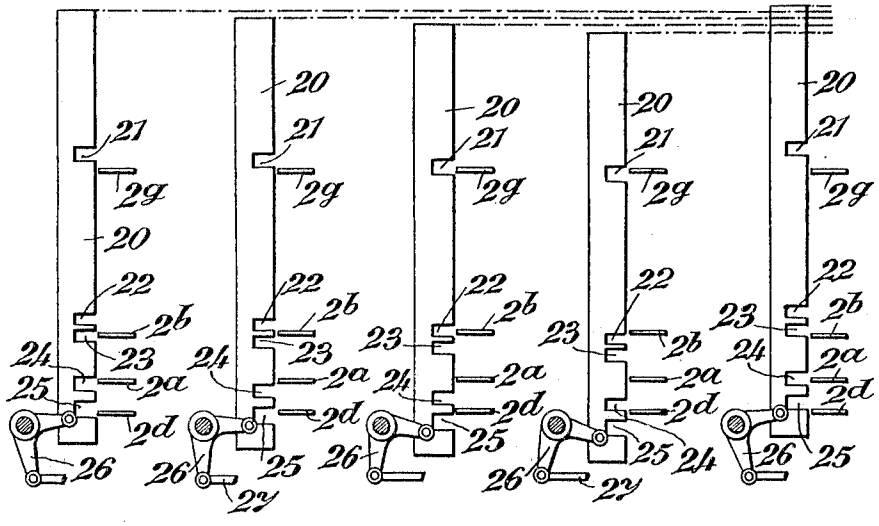


Fig. 6 Fig. 7 Fig. 8 Fig. 9 Fig. 10



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UNITED STATES PATENT OFFICE.

VICTOR KOBLER, OF ARBON, SWITZERLAND, ASSIGNOR TO THE FIRM OF ADOLPH SAURER, OF ARBON, SWITZERLAND.

EMBROIDERY-MACHINE JACQUARD APPARATUS.

1,107,674. Specification of Letters Patent. Patented Aug. 18, 1914.

Application filed May 6, 1913. Serial No. 765,971.

To all whom it may concern:

Be it known that I, VICTOR KOBLER, a citizen of the Republic of Switzerland, residing at Arbon, Switzerland, have invented new and useful Improvements in Embroidery-Machine Jacquard Apparatus; 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.

In jacquard embroidery machines the jacquard card has not only to control the motion of the work frame, but also to govern various temporary supplementary operations or extra or special functions, as they are sometimes called. These embrace all operations except the principal operations of the embroidery needles and shuttles. Among such supplementary operations may be mentioned, for instance, those for alteration of the depth of movement of the perforators, for throwing in and out the perforating mechanism, the punching mechanism, the clutch which couples the main driving shaft of the embroidery machine with the mechanism of the needles and shuttles, and the festooning forks, for changing the speed of the embroidery mechanism, for throwing in and out the main driving shaft and the tools for producing flat stitch, for operating the emery roll and the minor thread guides, and for changing the speed of the main shaft. Among these various auxiliary devices there are some which must not be thrown in simultaneously as their operation would cause mutual disturbance. Thus, for example, the perforators must never be actuated while the festooning mechanism is in operation, nor while the embroidery mechanism is still working. It is thus necessary that those mechanisms which control devices whose simultaneous operation would cause them to interfere with each other, be prevented from acting at the same time. For this purpose it has been proposed to throw out the jacquard apparatus automatically immediately such mechanisms tend to act simultaneously. This method, however, is complicated and involves loss of time. According to the present invention the desired end is attained by such a construction that on the mechanism for effecting a supplementary operation being thrown in, all the mechanisms of those auxiliary devices which would act prejudicially are locked against motion. In this way stoppage of the machine is rendered unnecessary.

An embodiment of my invention is illustrated in the accompanying drawing, those parts of the jacquard embroidery machine which are not necessary for a proper understanding of the present invention being omitted.

Figure 1 is a front elevation, partly broken out, of the jacquard apparatus and some of its connections. Fig. 2 is a plan of the parts shown in Fig. 1, partly in section. Figs. 3–5 show the locking bar actuating lever and coöperating parts in various positions. Figs. 6–10 are plan views showing the locking bar in different positions.

A designates the so-called automatic or jacquard apparatus.

1 are the jacquard blades, of well known description, which, depending upon their position, permit a partial rotary motion of latches 2 in the direction of the arrow. The latches on being so turned engage with pins 3 projecting from levers 4, which, on descent of the frame 5 on which are mounted the blades 1, with the latches 2, are thus drawn downward. This results in oscillation of the levers 6, whereby toothed wheels 7 are slid into engagement with other toothed wheels 8, which are constantly rotated. Since the frame 5 is moved continually up and down, the pinion 7 and gear 8 mesh only for a short interval, so that the pinion shaft is merely turned through a certain angle. The blades 1 are shifted by the jacquard card in the usual manner.

For the sake of clearness in the drawing the connections of only two co-axial shafts 9^b and 9^g and latches 2^b and 2^g are shown, though in reality there are a number of such latches and a corresponding number of such shafts, the present drawing, for instance, showing four latches and four such shafts. Each latch controls the mechanism of an auxiliary device. Thus the latch 2^a (Figs. 6–10) controls the mechanism for lowering the speed of the embroidery machine, the latch 2^b the mechanism for uncoupling the machine, the latch 2^d the mechanism for actuating the festooning forks, the latch 2^g the mechanism for actuating the perforators.

In the drawing only one of these mechanisms is depicted in detail by way of example, viz, that controlled by the latch 2^b, for uncoupling the embroidery mechanism. On the shaft 9^b a crank arm 10 is mounted outside the jacquard apparatus and to its pin there is connected a rod 11, whose other end is pivoted to a bent lever 12. The second arm of this lever is connected by a rod 13 with an arm 14 extending from a sleeve 15 of the clutch fork 16, which latter engages the sliding half of the friction clutch 17, which is provided between the main driving shaft 18 and the embroidery machine shaft 19. In front of the latches 2^a, 2^b, 2^d, 2^g, there is located a bar 20, which is slidable in longitudinal direction and is furnished with notches 21, 22, 23, 24, 25, adapted to receive the latches, which however are prevented by the interposition in their paths of the unnotched portions of the bar from turning, except when in register with the notches.

One arm of a bent lever 26 is pivoted at one end to the bar, while the other lever arm is jointed to a rod 27. The further extremity of the latter is jointed to a double-armed lever 28, fulcrumed on a pin 29. This lever 28 has an inclined edge 30, a lateral pin 31, and two rollers 32, 33, and is controlled by a spring 34. On the shaft 9^a there is mounted a crank 35, whose pin is connected by a link 36 with a lever 40, which turns on the shaft 9^b. This lever is provided with a pin 41, which coöperates with the inclined edge 30. On the connecting rod 11 there is fixed a stop 42, with which the pin 31 engages. Mounted on the shaft 9^d is a cam 43, against which the roller 32 bears. The shaft 9^g is connected with a shaft 45 by a worm gearing located in the housing 44, and the other end of the shaft 45 is connected by a crank 46 and rod 47 with the arm 48 of a double-armed lever 49, whose other arm 50 is adapted to engage with the roller 33 of the lever 28.

The operation of the above-described mechanism is as follows: While embroidering is proceeding the locking bar 20 is located in the normal position, as shown in Fig. 10. It is possible that through some defect in the jacquard apparatus the latch 2^a might be unintentionally actuated, but this would be of no moment, since it would merely result in the embroidery machine running more slowly. The latches 2^g, 2^b, 2^d, on the other hand, are locked and can thus make no movement. It is therefore impossible for, for instance, the perforators or the festooning forks to be thrown in during embroidering. If, however, due to one of the holes in the jacquard card the latch 2^a is oscillated, the shaft 9^a will be slightly rocked and by means of the pin 41 and inclined edge 30 the lever 28 will be turned from the position shown in Fig. 1 into that indicated in Fig. 3. It will thus exercise a pressure upon the rod 27 and hence actuate the lever 26, whereby the bar 20 is pushed from the position shown in Fig. 10 into that shown in Fig. 6. All three latches 2^b, 2^a, 2^d, are now free, while latch 2^g is still locked. The jacquard card can now cause actuation of latch 2^d, or 2^b; it might, by accident, actuate latch 2^a, but this would merely result in the position shown in Fig. 10 being restored. If, for instance, latch 2^d is actuated, the shaft 9^d will be turned and the cam 43, which acts on the roller 32, will push the lever 28 from the position shown in Fig. 3 into that shown in Fig. 4. This results in the bar 20 being slid from the position shown in Fig. 6 into that shown in Fig. 7. Thus only the latch 2^d for the return of the festooning mechanism is unlocked, all the other latches being locked. If however, instead of the latch 2^d, the latch 2^b were to be moved from the position shown in Fig. 6 by the jacquard apparatus, the rocking of shaft 9^b would cause the stop 42 to engage the pin 31 and turn the lever 28 from the position shown in Fig. 3 into that shown in full lines in Fig. 5. In this manner the bar 20 would exchange the position shown in Fig. 6 for that shown in Fig. 8, and the latches 2^d, 2^a, would be locked, while the latches 2^b and 2^g would be unlocked. If, for perforating, the jacquard card should cause actuation of the latch 2^g, the mechanism 45—49 will cause the lever arm 50 to be swung downward, so that the lever 28 is brought from the position shown in full lines in Fig. 5 into that shown by dotted lines. The bar 20 will now leave the position shown in Fig. 8 for that shown in Fig. 9, whereby the latches of all mechanisms which would disturb the perforating operation are locked.

It will be understood that the operation of the machine is not stopped by the action of the devices shown and described herein unless, indeed, the stopping of the machine is predetermined by the jacquard card, but that the operation of the machine and of the desired special function devices continues without interruption, while the operation of those special function devices which might interfere in their operation with that of the special function device which is to be continued in operation, is prevented. It will be understood furthermore that this result might be accomplished by the action of mechanical means other than those shown and described herein and that the invention, therefore, is not limited to the details of construction and arrangement of parts shown and described herein.

I claim:

1. In a jacquard embroidery machine, in combination, a plurality of independent devices for effecting different operations sup-

plemental to the principal operations, a jacquard apparatus, several means the operation of which is initiated by the jacquard apparatus for severally controlling the operation of said devices, and means for preventing the operation of certain of said devices while other of said devices are free to operate.

2. In a jacquard embroidery machine, in combination, a plurality of devices for effecting operations supplemental to the principal operations, a jacquard apparatus, several means the operation of which is initiated by the jacquard apparatus for severally controlling said devices, and other means acting to prevent the operation of certain of said several means while other of said several means are free to operate.

3. In a jacquard embroidery machine, in combination, a plurality of devices for effecting operations supplemental to the principal operations, a jacquard apparatus, several means the operation of which is initiated by the jacquard apparatus for severally controlling said devices, and other means actuated with the operation of one of said devices to prevent the operation of other of said devices.

4. In a jacquard embroidery machine, in combination, a plurality of devices for effecting operation supplemental to the principal operations, a jacquard apparatus, several means the operation of which is initiated by the jacquard apparatus for severally controlling said devices, and other means actuated by the movement of one of said several means to prevent the operation of other of said several means.

5. In a jacquard embroidery machine, in combination, a plurality of devices for effecting operations supplemental to the principal operations, a jacquard apparatus, several means the operation of which is initiated by the jacquard apparatus for severally controlling said devices, and a slidable notched bar shifted with the operation of one of said means to prevent the operation of other of said means.

6. In a jacquard embroidery machine, in combination, a plurality of devices for effecting operations supplemental to the principal operations, a jacquard apparatus, several means the operation of which is initiated by the jacquard apparatus for severally controlling said devices, a plurality of latches in operative relation with said means respectively and with the jacquard apparatus, a slidable notched bar for coöperating with said latches to prevent operative movement of certain of the latches while permitting operative movement of other of the latches, and means whereby said bar is shifted with the operation of any of said devices.

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

VICTOR KOBLER.

Witnesses:
JAKOB VOGEL,
EUGENE NABEL.