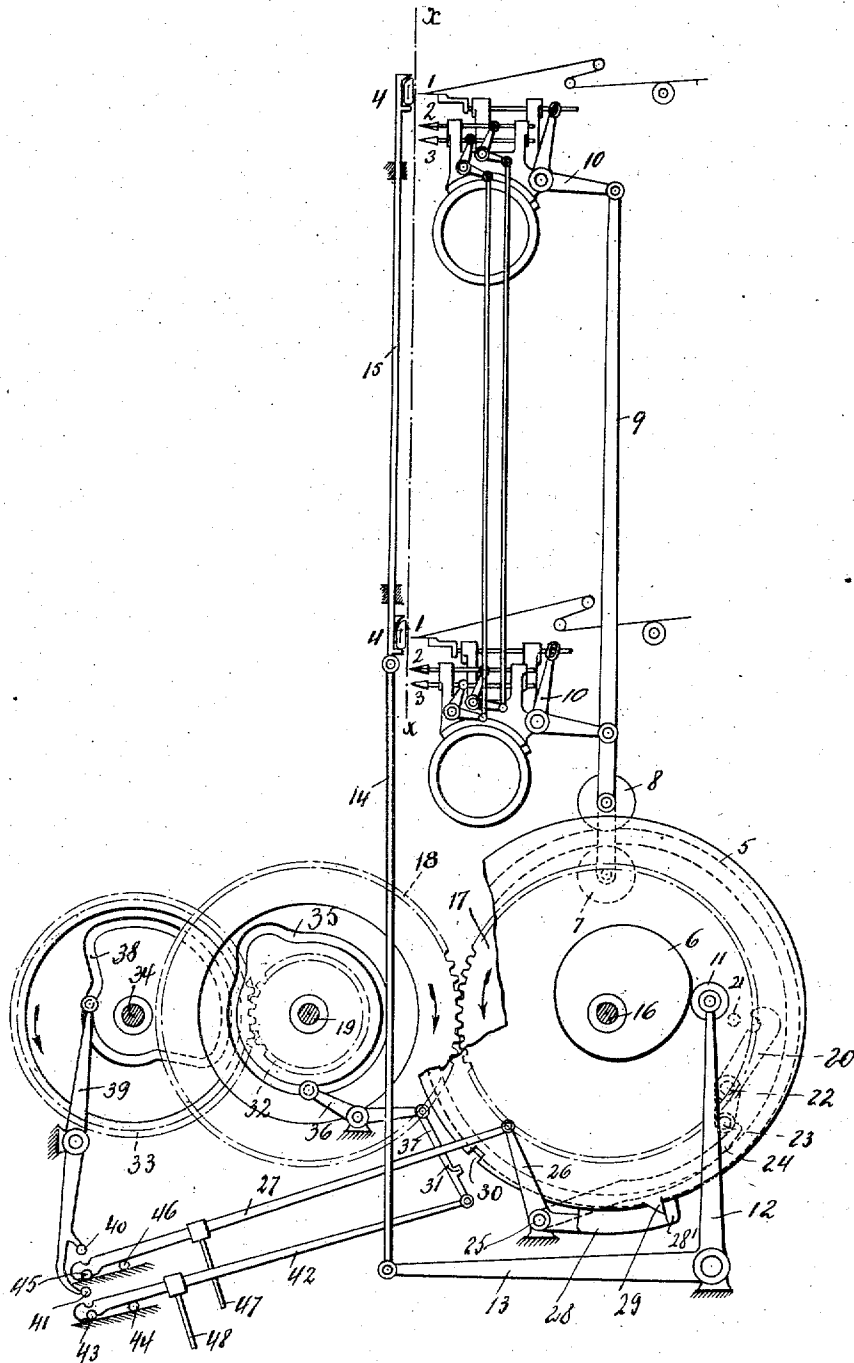


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JACQUARD EMBROIDERY MACHINE.
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1,020,010.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ROBERT ZAHN, a subject of the King of Bavaria, residing at Plauen, Vogtland, in the Kingdom of Saxony, Germany, have invented certain new and useful Improvements in Jacquard Embroidery-Machines, of which the following is a specification.

With ordinary embroidering machines, that are controlled by the aid of a pantograph, instead of automatically by the jacquard mechanism, every time prior to the commencement of the boring operation the embroidery frame must be given a movement, so as to bring the place at which the boring operation is to take place in alinement with the boring tools. Since this movement is connected with the pulling out of the embroidery threads from the needles and shuttles, a considerable force is herefor required, in consequence of which, in case of improper handling, the embroidery design may become distorted and some of the threads even broken. To avoid this, the operator through long experience generally helps himself by giving the main shaft of the machine a few turns to and fro, whereby the shuttles on the rear of the embroidery frame are caused to also execute a short reciprocatory movement. In this manner the pulling out of the shuttle threads and likewise that of the threads from the needles over their guides and from the thread rollers are greatly facilitated.

The object of my invention is to provide a device for jacquard machines, whereby prior to the commencement of the boring operation the pulling out of the shuttle threads is automatically accomplished.

The accompanying drawing illustrates diagrammatically a side view of an automatic embroidering machine.

Let x — x denote the embroidery or frame surface. In front of this embroidery surface operate in well known manner the needles 1, the bore tools 2 and the stufpel 3 and in the rear of the said surface operate the shuttles 4. The operation of the needles 1 is accomplished by a cam 5 and that of the shuttles 4 by a cam 6. The cam 5 may consist of a disk having a laterally projecting rim with the inner and outer surfaces of which rollers 7, 8 are in contact. These rollers 7, 8 are rotatively borne in a rod 9, whereby through the medium of a bell crank lever 10 movement from the needle operating cam 5 is transmitted to the needles 1. Roll-

ing on the circumference of the shuttle operating cam 6 is a roller 11 which is rotatively borne in the bell crank lever 12, 13, whereby through the medium of the rod 14 movement is transmitted from the cam 6 to the shuttle driving mechanism 15. The divers cams for the operation of the working mechanisms are all fixed on the main shaft 16 of the machine. To these belong also the needle operating cam 5 and the shuttle operating cam 6. Loosely borne, however, on the shaft 16 is a gear 17, which meshes with a gear 18 fixed on the driving shaft 19 whereby movement is transmitted to the said wheel 17. This wheel 17 is capable of being coupled to the cam 5 by means of a suitable coupling 20, 21. The clutch 20 is formed as a double-armed lever, which is pivoted at 22 to the cam 5 and one arm of which is notched so as to be capable of engaging a pin 21 projecting from the gear 17, while the other arm thereof carries a roller 23, which during the rotation of the shaft 16 comes into the path of a rail 24. The latter is capable of swinging around a stationary pivot 25, and the adjustment thereof is accomplished by means of a lever 26 and rod 27. Rigidly connected to the rail 24 and the lever 26 is a brake 28, which is provided with a stop 28' adapted to engage a nose 29 projecting from the circumference of the cam 5. In the position indicated in the drawing of the rail 24 and the rod 27, the clutch arm 20 and pin 21 are uncoupled; so that the wheel 17 is free to revolve, while the shaft 16 with all the flying masses thereon through the brake 28 is prevented from revolving until the nose 29 strikes the stop 28'. In this position of the cam 5, the recess 30 provided on the circumference of the latter lies opposite a pin 31 the object of which will be hereinafter fully explained.

Apart from the gear 18, a gear 32 is secured to the driving shaft 19, which meshes with the gear 33 to operate the shaft 34. The two wheels 17 and 18 have the same number of teeth while the number of teeth of the gear 33 is twice as large as that of the gear 32. Fixed on the shaft 19 is a disk provided with a cam groove 35 by means of which a double-armed lever 36 is caused to swing. A rod 37 connected to one arm of the lever 36 and provided with the above named pin 31 receives the swinging movement of the lever 36. Mounted on the shaft 34 is a disk having a cam groove 38, whereby

a swinging movement is imparted to a double-armed lever 39, one arm of which is provided with oppositely extending noses 40, 41. The lower end of the rod 37 having the pin 31 is pivotally connected to a rod 42, the free end of which is provided with two opposite notches. The upper notch of said rod is capable of engaging the nose 41 and the lower notch is capable of engaging any one of two stationary pins 43, 44. In like manner, the free end of the rod 27 is provided with two opposite notches, of which the upper is capable of engaging the nose 40 and the lower any one of two stationary pins 45, 46. The rod 27 is borne in a piece 47 and the rod 42 in a piece 48, which pieces are adapted to be reciprocated in longitudinal direction by the jacquard mechanism (not shown) controlling the embroidery machine.

The mode of operation is as follows:

Assuming the main shaft 16 of the machine has been just stopped in the position indicated in the drawing. This was accomplished by the upward movement of the piece 47, through the Jacquard mechanism, which has caused the engagement of the rod 27 with the nose 40, which rod 27 previously was engaged with the stationary pin 46. Since the lever 39 in consequence of the continuous rotation of the cam 38 is caused to swing there and back, the nose 40 has carried along with it to the left the rod 27. Immediately thereupon, the piece 47 has been pulled down again, so that the rod 27 has disengaged from the nose 40 and in its new left position become engaged with the stationary pin 45. In consequence of this adjustment of the rod 27, the brake 28 was brought in contact with the cam 5, the rail 24 has disengaged the clutch arm 20 from the pin 21 and the nose 29 was brought in contact with the stop 28'. The diverse working mechanism of the embroidering machine were thereby instantaneously stopped. Only the three wheels 17, 18 and 33 and consequently the levers 36 and 39 continue their movement. At the next moment, the piece 48 is operated by the Jacquard mechanism in like manner as the piece 47, whereby the rod 42 is first brought into engagement with the nose 41, which moves to the right, and thereupon is caused to engage the stationary pin 44. Through this adjustment of the rod 42 the pin 31 becomes engaged with the recess 30, in consequence of which the cam 5, owing to the swinging movement of the levers 36 is given a short swinging movement corresponding to that received by the rod 37. The consequence of this movement is that the bell crank lever 12, 13 is given a short swinging movement, since the shuttle operating cam 6 and needle operating cam 5 are fixed on the same shaft 16 and hence rigidly connected with one another. This swinging movement of the lever 12, 13 re-

sults in the reciprocating movement of the shuttles 4, since the driving mechanism 15 of the shuttles is connected through the rod 14 to the lever 12, 13. It thus follows that prior to the commencement of the movement of the bore tools 2 or the stupfel 3, the shuttles 4 receive a short reciprocating movement, while the embroidery frame or surface $x-x$ is lowered down from the level of the needles 1 to that of the bore tools 2 or stupfels 3, in consequence of which the shuttle threads are easily pulled out from the shuttles and the needle threads are easily pulled over their guides and through the needle ears.

Having thus described the nature of my invention, what I claim and desire to secure by Letters Patent is:

1. In a Jacquard embroidering machine, the combination with a driving part, of a driven part, needle and shuttle operating means operatively connected to said driven part, coupling means between said driving and driven parts, a Jacquard mechanism, and a Jacquard controlled means whereby the driven part is first set at rest and thereupon the needle and shuttle operating means are given a reciprocatory motion, allowing of the embroidering threads being easily pulled out from the shuttles and over the thread guides.

2. In a Jacquard embroidering machine, the combination with a driving part, of a driven part, needle and shuttle operating means operatively connected to said driven part, a Jacquard mechanism, Jacquard controlled coupling means between said driving and driven parts, Jacquard controlled means for setting the driven part at rest and Jacquard controlled means whereby upon first setting the driven part at rest, said needle and shuttle operating means are given a reciprocatory motion, allowing of the embroidering threads being easily pulled out from the shuttles and over the thread guides.

3. In a Jacquard embroidering machine, the combination with a driving part, of a driven part, needle and shuttle operating means operatively connected to said driven part, a Jacquard mechanism, a Jacquard controlled coupling means between the said driving and driven parts, Jacquard controlled braking means for the said driven part and Jacquard controlled means whereby upon first setting the driven part at rest, the said needle and shuttle operating means are given a reciprocatory motion, allowing of the embroidering threads being easily pulled out from the shuttles and over the thread guides.

4. In a Jacquard embroidering machine, the combination with a driving shaft, of a driven shaft, cams fixed on said driving shaft, needle and shuttle operating means controlled from said cams, a Jacquard mech-

anism, Jacquard controlled motion transmitting means between said driving shaft and the driven shaft, a Jacquard controlled coupling means between said cams and the
5 motion transmitting means, a Jacquard controlled braking means for the said driven part and Jacquard controlled means whereby upon first setting the driven part at rest, the said needle and shuttle operating means
10 are given a reciprocatory motion, allowing

of the embroidering threads being easily pulled out from the shuttles and over the thread guides.

In testimony whereof I affix my signature in presence of two witnesses.

ROBERT ZAHN.

Witnesses:

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