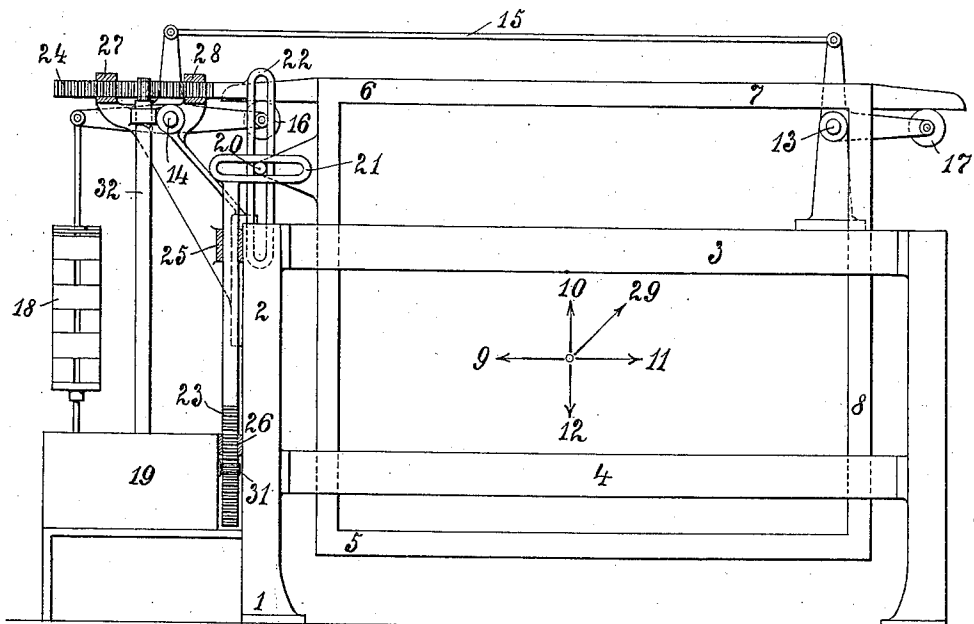
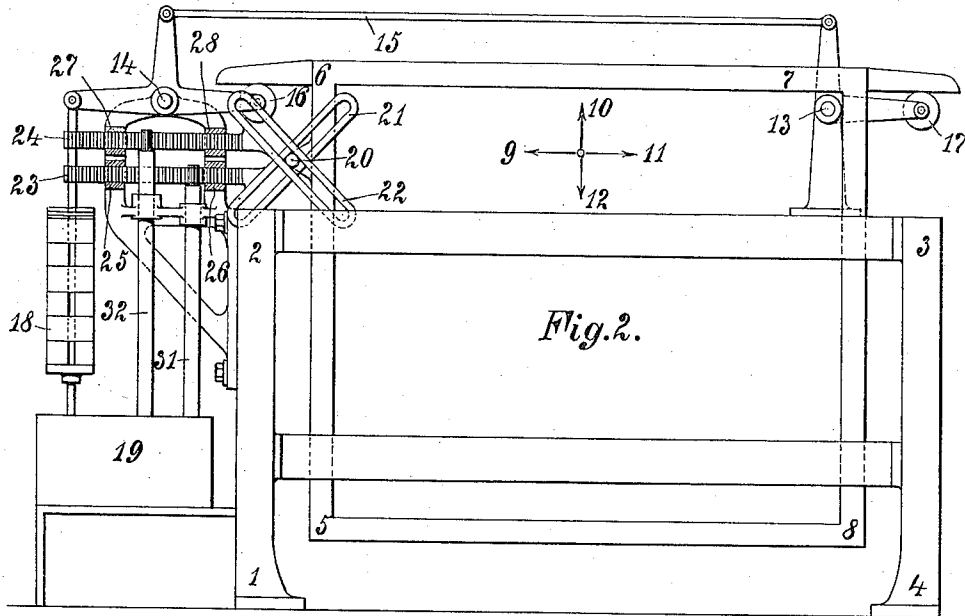


R. ZAHN.
EMBROIDERING MACHINE.
APPLICATION FILED OCT. 26, 1909.

1,045,354.

Patented Nov. 26, 1912.



Witness
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Fig. 1.

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UNITED STATES PATENT OFFICE.

ROBERT ZAHN, OF PLAUE, GERMANY.

EMBROIDERING-MACHINE.

1,045,354.

Specification of Letters Patent.

Patented Nov. 26, 1912.

Application filed October 26, 1909. Serial No. 524,708.

To all whom it may concern:

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

My invention relates to means for operating the embroidery frames of automatic embroidery machines.

In Figures 1 and 2 of the accompanying drawings two forms have been illustrated for carrying out the invention.

The embroidery frame 5, 6, 7, 8 has been arranged in the fixed frame 1, 2, 3, 4 of the embroidery machine in such a manner, that it can be moved in all directions indicated by the arrows 9, 10, 11 and 12. No details of this arrangement have been shown as they do not form part of the present invention. The drawings are diagrammatic. At 13, 14 bell crank levers are pivoted which are positively connected with each other by a rod or wire rope 15 so that both levers will always make the same movements. The embroidery frame 5, 6, 7, 8 rests on rollers 16, 17 and is balanced by the counter weight 18.

The rectangle 19 indicates the position of the Jacquard apparatus whose object it is to automatically move the embroidery frame 5, 6, 7, 8 when the embroidery machine is being operated.

On the left hand side of the embroidery frame a horizontal pin 20 has been fixed which passes through two slots 21, 22. The two slots 21, 22 are arranged at right angles to each other. The slots 21, 22 have been made integral with the racks 23, 24 respectively. The latter are supported at 25, 26 and 27, 28 respectively so that they can be moved in a longitudinal direction.

If according to the arrangement shown in Fig. 1 the rack 24 is at rest and the rack 23 moved up and down in a vertical direction the embroidery frame 5, 6, 7, 8 will also be moved vertically. The pin 20 will then slide up and down in the slot 22. If however the rack 23 has been arrested and the rack 24 is moved to and fro in a horizontal direction, the pin 20 will slide in the slot 21, and the embroidery frame 5, 6, 7, 8 is also moved horizontally. In case both racks 23 and 24 are moved simultaneously in one or the other direction, the pin 20 will follow

both movements and the frame 5, 6, 7, 8 is moved in an oblique direction. If for instance the rack 24 is moved in the direction indicated by the arrow 11 and the rack 23 in the direction of the arrow 10, the embroidery frame 5, 6, 7, 8 will move in the direction of the arrow 29. By disposing the racks at right angles to each other, I economize space and permit of the actuation of the racks simultaneously either in similar or different directions, so as to give the necessary movement to the frame and also provide for movement of the slotted members in direct lines without liability of torsional strain or undue friction.

The arrangement illustrated in Fig. 2 differs from that shown in Fig. 1 in that both racks 23, 24 can be moved parallel side by side and horizontally. In order to be able to obtain these movements both slots 21, 22 are so arranged as to form an angle of 45° with the horizontal plane.

The two shafts 31 and 32 which are reciprocated by the Jacquard apparatus 19 cause the two racks 23, 24 to be moved. The ends of these shafts are fitted with teeth which mesh accurately with the teeth of the racks 23, 24.

The known embroidery machines have already been fitted with various arrangements somewhat similar to those shown in Figs. 1 and 2. My invention however consists in that I arrange the pin 20 in close proximity of the roller 16, in other words close to the point from which the great and heavy load of the embroidery frame is suspended.

In order to be able to fully appreciate the practical importance of this invention it should be borne in mind that the figures are of a diagrammatic nature only and that the various parts of the machine have not been drawn to scale.

The length of the frame 5, 6, 7, 8 of the largest size machines which have ever been built amounts to about 28 yds. and its weight to from 550 to 660 lbs. approx. The frame cannot be stiffened by means of diagonal tie bars. Consequently the frame is an elastic structure which can easily become deformed owing to forces acting sideways. The frame oscillates and vibrates while the machine is in operation. Great oscillations have been experienced with the embroidery frames which have hitherto become known, as the pin 20 of these was, contrary to the present invention, arranged at

the lower part of the frame and about at a point indicated on the drawings by the Fig. 5.

The new frame with the pin 20 arranged as shown on the drawings works practically without vibrations, and the embroideries made with these frames are uniform throughout the whole surface of the frame.

What I claim is:

10 1. In a device of the class described, a rectangular embroidery frame, stationarily supported rocking means from which the said embroidery frame is movably suspended, a pin fixed to the upper end of one of the
15 side posts of the said embroidery frame in close proximity to the point of suspension thereof, slotted members having their slots intersecting each other, said pin being receivable in the said slots at their point of
20 intersection, and longitudinally movable racks rigid with the said slotted members.

2. In a device of the class described, a rectangular embroidery frame, a pin fixed to the upper end of one of the side posts of
25 said frame in close proximity to the point of suspension thereof, slotted members having their slots intersecting each other, said pin being receivable in the slots at their point of intersection, racks rigid with said slotted
30 members and means supporting said racks for movement in a longitudinal direction, said racks being disposed at right angles to each other.

3. In an embroidering frame, a Jacquard mechanism, an embroidery frame for auto- 35 matic operation by the said Jacquard mechanism, a pin fixed on said embroidery frame, slotted members having their slots intersecting each other, said pin cooperating with both of said slots at their point of intersection 40 and being arranged at the upper end of one of the side posts of and in close proximity to the point of suspension of the said embroidery frame, and longitudinally movable racks rigid with the said slotted mem- 45 bers and each separately controlled by the said Jacquard mechanism.

4. In a device of the class described, a rectangular embroidery frame, a pin fixed to the upper end of one of the side posts 50 of and just below the point of suspension of said frame, slotted members having their slots intersecting each other, said pin being receivable in the slots at their points of intersection, racks rigid with said slotted 55 members and means supporting said racks for movement in longitudinal direction, said racks being disposed at right angles to each other.

In testimony whereof I affix my signature 60 in presence of two witnesses.

ROBERT ZAHN.

Witnesses:

ERNST WAGNER,

ROBERT HEINRICH NIER.

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