J. A. GROEBLI.

EMBROIDERING MACHINE.

APPLICATION FILED MAY 25, 1917.

1,268,243.

Patented June 4, 1918.

2 SHEETS—SHEET 1.

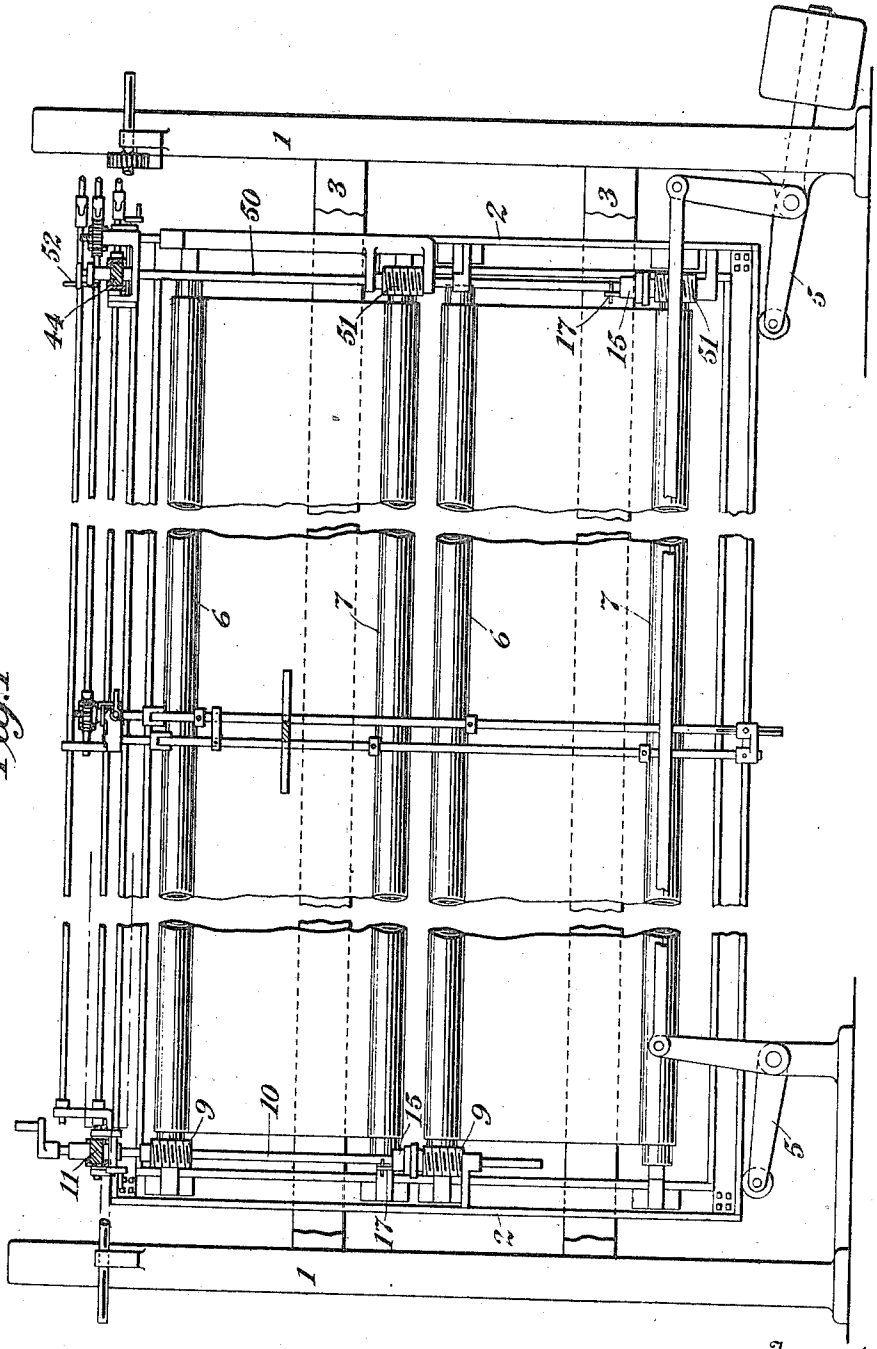


Fig. 1

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2 SHEETS—SHEET 2.

Fig. 2

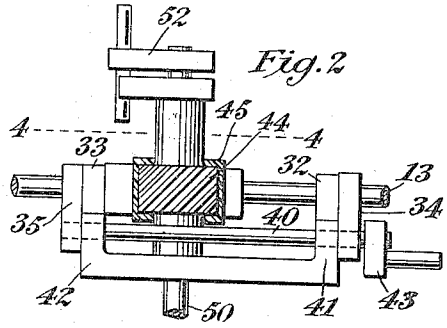


Fig. 4

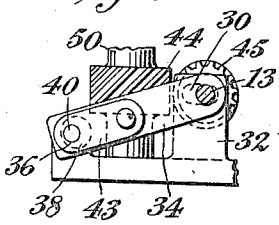


Fig. 11

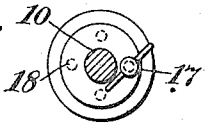


Fig. 3

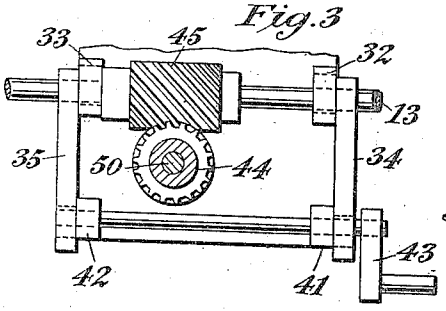


Fig. 5

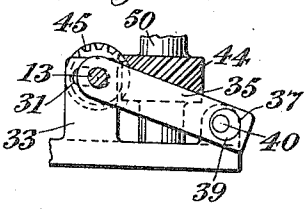


Fig. 10

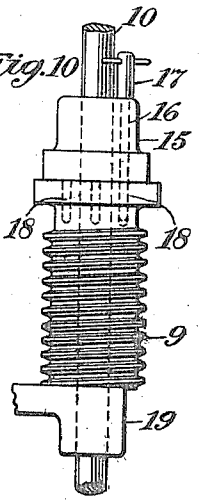


Fig. 8

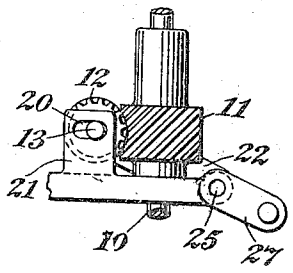


Fig. 6

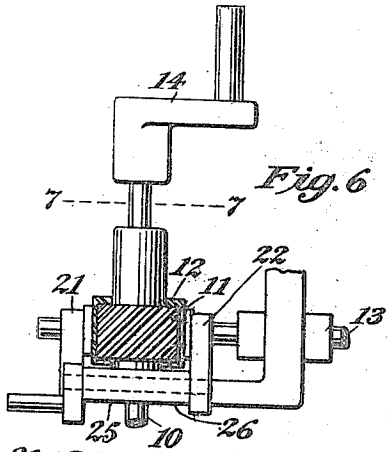


Fig. 7

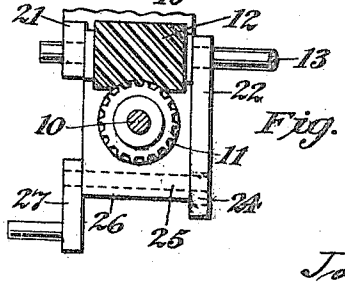
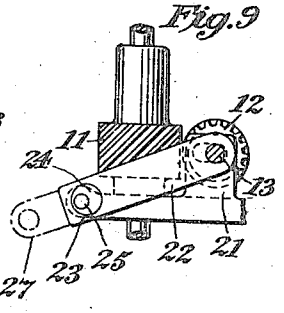


Fig. 9



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UNITED STATES PATENT OFFICE.

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EMBROIDERING-MACHINE.

1,268,243. Specification of Letters Patent. Patented June 4, 1918.

Application filed May 25, 1917. Serial No. 170,814.

To all whom it may concern:

Be it known that I, JOSEPH A. GROEBLI, a citizen of the United States, residing at No. 307 West Fourth street, borough of Manhattan, New York, N. Y., have invented new and useful Improvements in Embroidering-Machines, of which the following is a specification.

My invention relates to embroidering machines wherein the fabric to be embroidered is carried upon a tambour frame which is moved, step by step, into successive positions appropriate for the application of the designed embroidery by reciprocating needles. And my improvements are directed to means for facilitating the placing and adjustment of the fabric upon the fabric holders carried by the tambour frame, and its movement thereupon, the particulars of my improvements being hereinafter pointed out and claimed.

In the drawings Figure 1 is a rear elevation of the frame of an embroidering machine, partially broken away for clearness, and of its tambour frame, the figure being shortened by the omission of medial portions; Fig. 2 is a detail elevation of the mechanism for disconnecting the worm and worm gear which normally actuate the lower fabric roller of each pair; Fig. 3 is a plan view taken on the line 4—4 of Fig. 2; Fig. 4 is an end view of the portion of Fig. 2 shown in Fig. 3 looking to the left on Fig. 2; Fig. 5 is an end view of the same looking to the right on Fig. 2; Fig. 6 is a detail in elevation of the mechanism for disconnecting the worm and worm gear which normally actuate the upper fabric rollers of each pair; Fig. 7 is a plan view of the same taken on the line 7. 7 of Fig. 6; Fig. 8 is an end view of the same, looking to the right on Fig. 6; Fig. 9 is an end view of the same looking to the left on Fig. 6; Fig. 10 is a detail elevation of the upper part of the disconnectible worm for actuating the fabric rollers of the lower pair; and Fig. 11 is a plan view of the same; Figs. 2 to 11 are on an enlarged scale.

Similar parts are designated by corresponding reference numerals in all the figures.

The main frame of the machine is shown in a conventional form, as embodying ends 1, 1, with bars 3, 3, connecting the same; and in this frame is mounted the tambour frame 2, which is carried by counterbalanced and linked levers 5, 5, so that it may be readily moved into the desired stitch positions in the manner and by the means which are well understood in the art, and which, for that reason, I have not illustrated.

In this tambour frame 2 are mounted the fabric rollers, which I have illustrated as consisting of two pairs of rollers 6, 7, 6, 7, the upper roller of each pair being provided at one end with a worm gear, not shown, meshing with a worm 9 carried by a shaft 10 mounted in bearings in the tambour frame 2, and provided near its upper end with a worm gear 11 meshing with a worm 12 upon a driving shaft 13 mounted upon the tambour frame.

The shaft 10 is preferably extended upward into a crank handle 14, by which it may be rotated, if desired. And while one of its worms 9 is preferably secured so as to rotate with it at all times, the other worm 9, as for instance, the lower one, is detachably secured to the shaft so that, optionally, it may be released to permit independent relative movement. I have illustrated this as being accomplished by permanently attaching a collar 15 to the shaft 10, and providing the collar with a hole 16 to accommodate a pin 17, which passes through the collar and into one of the plurality of holes 18, 18 in the worm 9, which is carried by the lug 19 on the tambour frame and through which worm the shaft 10 passes freely. When the pin 17 is inserted in one of the holes 18, it will cause the worm and shaft to move together; and when the pin is withdrawn they may move independently.

The end of the shaft 13 is so mounted that it may be moved toward or away from the worm gear 11. I have illustrated this as being accomplished by providing an elongated bearing 20 in a lug 21 on the tambour frame, and by passing the shaft 13 through one end of an arm 22 provided at its other end with a cam socket 23 in which turns a cam 24 attached to the end of a shaft 25 turning in a bearing 26 on the tambour frame, and provided with a crank handle 27 by which it may be rotated.

By turning the crank 27, for instance, into the position shown in Figs. 6, 7 and 8, the end of shaft 13, may be drawn toward the worm gear 11 so as to cause the worm 12 and worm gear 11 to mesh; and by reversing

the movement of the crank 27 the worm and gear may be separated, as shown in Fig. 9.

The shaft 13 extends across above the tambour frame and is mounted at its other end in elongated bearings 30, 31 in lugs 32, 33 on the tambour frame. Two arms 34, 35 are journaled on the shaft 13 and are provided with cam sockets 36, 37, accommodating cams 38, 39, carried by a shaft 40, mounted in lugs 41, 42 on the tambour frame, and provided with a crank handle 43 by which it may be turned so as to move the shaft 13 toward or away from the worm gear 44, and to thereby cause the worm 45 to mesh with the worm gear 44 or to separate therefrom.

This mechanism for meshing and separating the worm 45 and gear 44 is similar to that for meshing and separating the worm 12 and gear 11, except that in the former instance I journal two shifting arms 34, 35 upon the shaft 13, instead of one arm 22, so as to give a stronger control of the shaft, which is desirable owing to the greater tension to which the end of the shaft nearest to the source of power is subjected.

The worm gear 44 is secured to a shaft 50 mounted in bearings on the tambour frame. And this shaft 50 has secured thereto two worms 51, 51, which mesh with worm gears, not shown, on the ends of the lower rollers 7 of the pairs of fabric rollers, one of these worms, as the upper one, being keyed to the shaft 50, and the other thereof being detachably attached thereto by a key 17 and collar 15 corresponding in construction to the key and collar for connecting the worm 9 to shaft 10, as already described. The upper end of the shaft 50 is provided with a crank handle 52 whereby it may be rotated, if desired.

By the above described means I am enabled to disconnect both the upper fabric rollers and the lower fabric rollers from the driving shaft 13, at pleasure. And I am also enabled to move the fabric rollers, when so disconnected, by hand, either the corresponding rollers of each pair simultaneously, or separately, by disconnecting the worms 9 and 51 from their particular shafts, and also to move by power those rollers which are not disconnected. This arrangement gives a very desirable freedom of adjustment in inserting and removing fabric, and in adjusting and preliminarily tensioning it. And this is of marked advantage to the operative in manipulation of the fabric into, in and out of the machine.

My improved mechanism may be operated as follows:

It is customary in the art to reel the unembroidered fabric upon the lower fabric rollers 7, 7, and, to wind the finished embroidery around the upper fabric rollers 6, 6, so as to present fresh portions of the fabric to the needles for embroidering as the work progresses. When, therefore, the work upon any particular piece of fabric has been completed, the finished product, except its last end, will be rolled upon the upper rollers 6, 6. And it then becomes necessary to remove the finished embroidery from the machine and to place new fabric therein so that the work may be continued.

The fabric is first preferably reeled up upon the upper roller 6 until its end can be freed from the lower roller 7 to which it has been detachably attached in any well known manner, as, for instance, by the use of a needle pointed holding bar attached thereto. The fabric is then drawn off of the fabric roller 6, the roller either being turned by the shaft 13, worm 12 and gear 11, by leaving the worm and gear in mesh and reversing the direction of rotation of shaft 13, or by disconnecting the worm and worm gear and turning the shaft 10 by means of the handle 14. During this operation the worm 45 and gear 44 may be disconnected by manipulating the crank 43, so as to allow the lower fabric rollers 7, 7 to remain at rest.

The fabric from the lower roller 6 is drawn up behind the upper roller 7 and upper roller 6 and out of the machine. And in this manner the fabric is removed from both sets of rollers and taken out of the machine.

New fabric having been connected to the lower rollers 7, 7, the driving shaft may then be disconnected from the upper roller operating mechanism, by separating the worm 12 from the worm gear 11; and the mechanism for turning the lower rollers 7 may be connected to the driving shaft 13, by meshing the worm 45 with the worm gear 44. The fabric may then be reeled on to the lower rollers 6, 6, by turning the driving shaft 13 in the proper direction. When the fabric has been substantially wound upon the rollers 7, 7, any inequality in the amount remaining for attachment to the proper upper roller may be taken care of by independent movements of the corresponding lower roller 7, which may be obtained by withdrawing the pin 17 so as to free the worm 51 from the collar 15, so that the worm may be turned by hand, if desired, independently of the collar 15, and shaft 50, and so that the upper roller 7 may be turned any desired distance in either direction by means of the handle 52 on the shaft 50. The upper ends of the fresh fabric are then attached to their proper rollers 6, 6, and the slack is taken up and the fabric properly adjusted, either by turning the upper rollers 6, 6, simultaneously through the shaft 10 and handle 14; or by turning them independently after the pin 17 has been withdrawn from the worm 9;

or by turning the lower fabric rollers simultaneously or independently as already explained; or by combinations of those movements. And when the fabric has been properly adjusted upon the rollers 6, 7, 6, 7, the pins 17 should be reinserted in the sockets of the worms 9 and 51, and the worms 12 and 45 on shaft 13 should be meshed with their respective worm gears 11 and 44, so as to put the feeding mechanism in proper position for the normal operation of the machine.

It will be understood that the particular forms of means which I have illustrated for carrying into effect my improvements are used as types of desirable mechanical constructions; and that I do not desire to limit myself merely to the specific details of these forms.

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

1. In an embroidering machine of the class mentioned, the embodiment of a tambour frame, a plurality of fabric-holding and transferring rollers, common means for actuating all the fabric rollers simultaneously in either direction, independent means for actuating the same separately in either direction, and readily operable means for optionally establishing and discontinuing operative relation between the common means and the fabric rollers.

2. In an embroidering machine of the class mentioned, the embodiment of a tambour frame, a plurality of fabric-holding and transferring rollers adapted to perform similar functions, common means for actuating the said fabric rollers simultaneously in either direction, independent means for actuating the same simultaneously in either direction and one thereof in either direction while permitting movement of the remainder in either direction, and readily operable means for bringing the common means and the independent means optionally into operative relation to the fabric rollers.

3. In an embroidering machine of the class mentioned, the embodiment of a tambour frame, a plurality of sets of fabric holding and transferring rollers, common means for actuating all of the rollers simultaneously in either direction, independent means for actuating the corresponding rollers of all the sets simultaneously in either direction, and readily operable means for bringing the common means and the independent means optionally into operative relation to the fabric rollers.

4. In an embroidering machine of the class mentioned, the embodiment of a tambour frame, a plurality of fabric-holding and transferring rollers, common means embodying worms and worm gears, for actuating the fabric rollers simultaneously, independent means for actuating the same separately, and readily operable means for optionally establishing and discontinuing operative relations between the common means and the fabric rollers, by meshing or disconnecting said worms and worm gears.

5. In an embroidering machine of the class mentioned, the embodiment of a tambour frame, a plurality of fabric-holding and transferring rollers, common means for actuating the fabric rollers simultaneously in either direction, independent means for actuating the same separately and in pairs in either direction, and readily operable means for bringing the common means and the independent means optionally into operative relation to the fabric rollers.

6. In an embroidering machine of the class mentioned, the embodiment of a tambour frame, a plurality of fabric-holding and transferring rollers, common means for actuating the fabric rollers simultaneously, independent means for actuating the same separately, and readily operable means, embodying transverse bearing shifting mechanism, for optionally establishing and discontinuing operative relation between the common means and the fabric rollers.

7. In an embroidering machine of the class mentioned, the embodiment of a tambour frame, a plurality of fabric-holding and transferring rollers, common means for actuating the fabric rollers simultaneously, independent means for actuating the same separately, and readily operable means, embodying bearing shifting mechanism, having controlling cam-levers, for optionally establishing and discontinuing operative relation between the common means and the fabric rollers.

JOSEPH A. GROEBLI.

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