M. HORAT.

ORNAMENTAL STITCHING AND EMBROIDERY MACHINE.

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1,413,274. **Patented Apr. 18, 1922.**

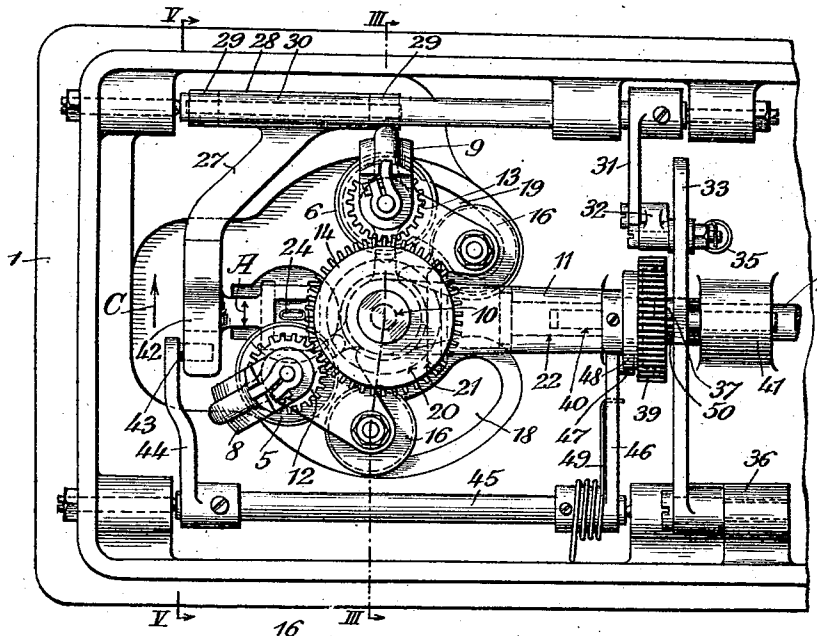


Fig. 1

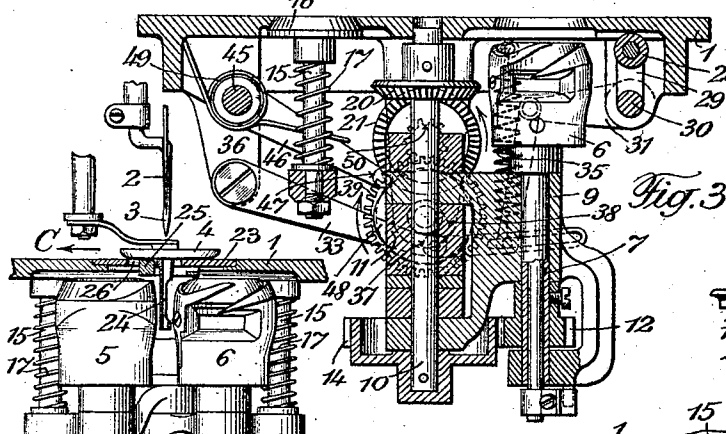


Fig. 3

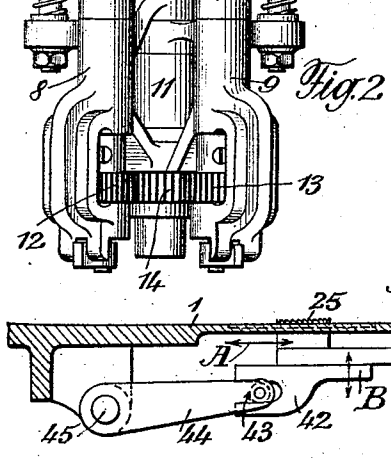


Fig. 2

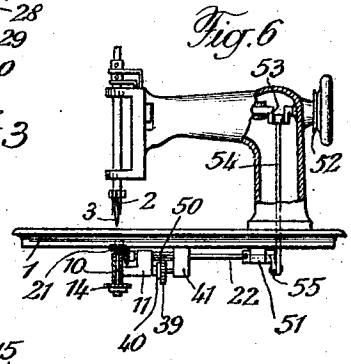


Fig. 6

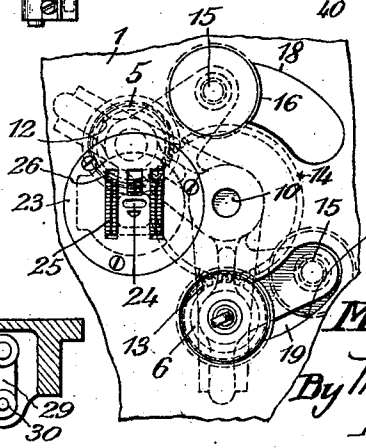


Fig. 4

Fig. 5

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UNITED STATES PATENT OFFICE.

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ORNAMENTAL STITCHING AND EMBROIDERY MACHINE.

1,413,274. Specification of Letters Patent. Patented Apr. 18, 1922.

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(GRANTED UNDER THE PROVISIONS OF THE ACT OF MARCH 3, 1921, 41 STAT. L., 1313.)

To all whom it may concern:

Be it known that I, MARTIN HORAT, a citizen of the Republic of Switzerland, residing at Steckborn, Switzerland, have invented certain new and useful Improvements in Ornamental Stitching and Embroidery Machines, (for which I have filed applications in Switzerland March 31, 1919, Patent No. 83,490, and in Germany April 14, 1919, application No. G. 48,122;) and I do hereby declare the following to be a clear, full, 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.

The object of the present invention is a hemstitch sewing machine of the type in which at least one shuttle is provided arranged in front or behind the needle with which it cooperates in the direction in which the fabric is fed.

With the hitherto known hemstitch sewing machines of this type the shifting of the fabric has been effected by means of bands. To these machines the following disadvantages are inherent: No sewing along curves can be effected, and it is only possible to sew at a certain distance from the edge of the fabric, the bands are liable to frequent ruptures whereby the ruptured band has to be removed and a new band inserted which action, when carried out by unskilled workmen, causes interruptions in the proper working of the machine, finally the bands are in time soiled with oil in which case they are apt to glide and cause the machine to perform longer or shorter stitches.

There are hemstitch sewing machines known in which the bands are replaced by known jumper feeders. Such machines have the disadvantage that the shuttles cannot be swung out of their operative position so that an exchanging of the reels is very cumbersome and takes up much time.

The object of the present invention is a hemstitch sewing machine with a jumper feed member in which the disadvantages above described are overcome.

To this end near the shuttle a space available for the driving members of the feed device is provided by arranging the axle around which the shuttle is adapted to be swung at the same time as driving axle for actuating the shuttle or the shuttles, whereby the shuttles and said axle remain in every angular position of the shuttles during said swinging motion in positive driving connection with each other.

One mode of carrying the invention into effect is shown by way of example on the accompanying drawings, in which:

Fig. 1 is a view of a hemstitch sewing machine fitted with two shuttles seen from below, wherein one of the shuttles is in the operative position and the other in the inoperative position.

Fig. 2 is a side view of the two shuttles and of the driving mechanism for same, whereby both shuttles are shown in their operative position, the base plate being shown in section;

Fig. 3 is a section along line III—III of Fig. 1,

Fig. 4 is a plan view of part of Fig. 1.

Fig. 5 is a section along line V—V of Fig. 1 showing parts of the mechanism actuating the feed device;

Fig. 6 is a general arrangement showing the drive for the shaft actuating the shuttle operating mechanism and the feed device.

1 denotes the base plate of the machine, 2 (Fig. 2) is one of the two needles (both needles are shown in Fig. 6) which is guided in a piercer-tube 3 and 4 is the presser-foot for holding down the fabric. 5 and 6 are hook-shuttles serving to take up the spools or reels not shown, the shuttles being mounted one behind the other in line with the needles in the direction of the feed of the fabric. Each shuttle 5, 6 is provided with a sleeve 7 (Fig. 3). The sleeve 7 of the shuttle 5 is rotatably mounted in an arm 8 and the sleeve 7 of the shuttle 6 is rotatably mounted in an arm 9. The two arms 8, 9 are swingably arranged about a common axle or shaft 10, which is rotatably

mounted in the base plate 1 and in a neck bearing 11 integral with said plate. The axis of the shaft 10 is arranged in one common vertical plane with the longitudinal axis of a slot 24 provided in a plate 23, recessed into the base plate 1, and serving to admit of a passage of the needles therethrough. Toothed wheels 12 and 13 respectively are rigidly connected to the sleeves 7 of the respective shuttles 5, 6. These toothed wheels 12, 13 mesh with a toothed wheel 14 fixed to shaft 10. The two arms 8, 9 being swingably mounted about the axle 10, the two wheels 12, 13 are always in engagement with the gear wheel 14. Each arm 8, 9 is further provided with a locking member 16 mounted on a pin 15 and adapted to be displaced against the action of a spring 17. In the operative position of shuttles 5, 6 the locking member 16 is in engagement with an enlarged hole provided at the end of an aperture 18 and 19 respectively. The shaft 10 carrying the toothed wheel 14 is fitted with a bevel wheel 20 near to the base plate 1, which bevel wheel cooperates with a bevel wheel 21 mounted on a shaft 22. The shaft 22 is mounted in a neck bearing 11 and 51 and is driven in a well known manner from a cord pulley 52 for instance by means of a crank 53, connecting rod 54 and crank 55 as shown in Fig. 6.

Further the plate 23 recessed into the base plate 1 and rigidly secured thereto, is provided with slots 26 serving to admit of a passage therethrough of parts of the fabric-feeding device 25, mounted in the base plate 1 and being fixed to the lateral extension 27 of a pin 28 carried by two arms 29 fixed to a shaft 30 which is rotatably mounted below the base plate 1. A lever arm 31 is fixed to the shaft 30, a rod 32 (Fig. 3) being connected to said arm. A pin carried by the rod 32 projects into the slot of a lever 33, turnably arranged in a bearing 36, a spring 35 fixed at its one end to said pin and at its other end to the base plate 1 is further provided. The lever 33 is provided with a small roller 37 projecting into a recess of the cup-shaped wheel body of a gear wheel 39 and coacting with a cam 38 (Fig. 3). The gear wheel 39 is in mesh with a gear wheel 50 (Fig. 3). The cam 38 is fixed to a shaft 40 which carries the gear wheel 39 and is mounted in the neck bearing 11 and in a bracket 41 integral with the base plate 1. A fork 42 is further provided at the part 27. A pin 43 of an arm 44 (Figs. 5 and 1) projects into the bifurcation 42, the arm 44 being fixed to a shaft 45 turnably mounted on the base plate 1. The shaft 45 carries an arm 46 provided with a laterally projecting pin 47. The pin 47 is constantly pressed against a cam disc 48, integral with the wheel 39, by the action of a spring 49.

During the operation of the above described machine the two shuttles 5, 6 are in their operative position, i. e. they are arranged one behind the other as shown in Fig. 2 in the direction C indicated by arrows in Figs. 1 and 2 in which direction the fabric is fed. The gear wheels 12 and 13 of the shuttles 5, 6 are in mesh with the gear wheel 14, whereby the shuttles 5, 6 are rotated upon a rotation being imparted to the shaft 22. At the same time the gear wheel 39 and the cam disc 48 integral with the former are rotated as well as the shaft 40 carrying the former. The cooperation of the parts 38, 37, 33, 32, 31, 30, 29, 28 and 27 causes a to and fro movement being imparted to the feed member 25 as indicated by arrows A in Figs. 1 and 5 and the cooperation of the parts 48, 47, 46, 45, 44, 43, and 42 causes an up and down movement in the direction of the arrows B of Fig. 5 being imparted to said feed member 25. The up and down movement and the to and fro movement are partly effected simultaneously whereby the known eccentric or swinging movement of the member 25 results.

If it is desired to remove one of the shuttles 5, 6 out of its operative position for the purpose of removing a reel casing therefrom, the locking member 16 carried by the arms 8 or 9 respectively which act as supporting part to the corresponding shuttle are brought out of engagement with the enlarged end part of the aperture 18 or 19 respectively, whereupon the shuttle together with the arm 8 or 9 is swung into the inoperative position. In Figs. 1 and 4 of the drawings the shuttle 6, for instance, is shown in the inoperative position. In this position, however, the gear wheel 13 is still meshing with the gear wheel 14, as the arm 9 has performed a circular swinging motion around the axis of the shaft 10 as center.

The above described drive for actuating the shuttles 5, 6 is of a very compendious construction which allows of using a feed member carrying out a jumping motion, such members for feeding the fabric having given the best results in hemstitch sewing machines.

The use of this feed member enables a sewing along curves and along an edge of the fabric being performed, further irregularities in the length of the stitches are overcome and the frequent replacing of the hitherto used fabric shifting devices is avoided. The above described drive is very effective and reliable and does not lose its accuracy.

It is evident that the drive can also be used for operating only one shuttle as well as for operating more than two shuttles, the number of gear wheels actuated by the gear wheel 14 corresponding to the number of shuttles used.

I claim:

1. In a shuttle operating mechanism for

hemstitch sewing machines, the combination of at least one shuttle arranged in its operative position in line with the needle cooperating with said shuttle in the direction in which the fabric is fed, an axle, means for supporting each shuttle and adapted to be swung around said axle for moving each shuttle separately from its operative position into a position in which a bobbin can conveniently be exchanged, means interposed between said axle and the shuttle for operating the latter, and means to actuate said axle.

2. In a shuttle operating mechanism for hemstitch sewing machines, the combination of at least one shuttle arranged in its operative position in line with the needle cooperating with said shuttle in the direction in which the fabric is fed, an axle, an arm connected to each shuttle for supporting the latter and adapted to be turned around said axle for moving each shuttle separately from its operative position into a position in which a bobbin may conveniently be exchanged, a gear wheel on said axle, a gear wheel on each shuttle engaging with said gear wheel on the axle, means to actuate said axle and thereby the shuttles, and means to hold the arm carrying the shuttle in position after the shuttle has been turned out of its operative position for having a bobbin exchanged.

3. In a shuttle operating mechanism for hemstitch sewing machines, the combination of at least one shuttle arranged in its operative position in line with the needle cooperating with said shuttle in the direction in which the fabric is fed, an axle, an arm associated with each shuttle for supporting the latter and adapted to be turned around the axle for moving each shuttle separately from its operative position into a position in which a bobbin can conveniently be exchanged, a gear wheel on said axle, a gear wheel on each shuttle engaging with said gear wheel on the axle, means to actuate said axle and thereby the shuttles, and a spring loaded locking member carried by said arm and adapted to engage with recesses for holding said arm in position after the shuttle has been turned out of its operative position for having a bobbin exchanged and when the shuttle is in its operative position.

In testimony that I claim the foregoing as my invention, I have signed my name.

MARTIN HORAT.