Dec. 10, 1935. L. O. BOUCHARD 2,023,868

SEWING MACHINE

Filed Aug. 7, 1935 2 Sheets-Sheet 1

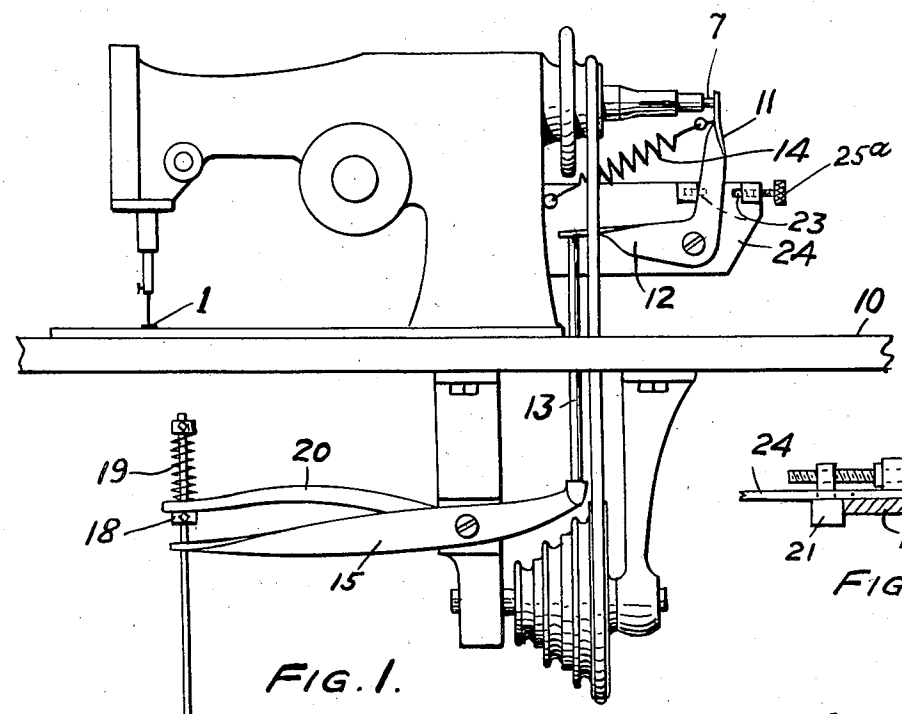


FIG. 1.

FIG. 2.

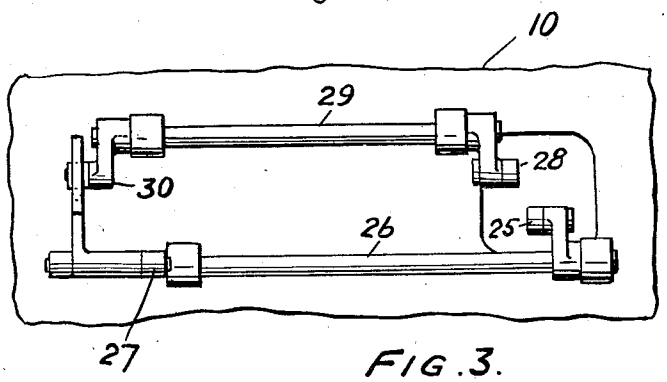


FIG. 3.

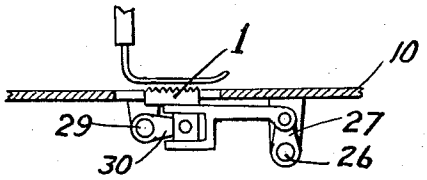


FIG. 4.

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SEWING MACHINE

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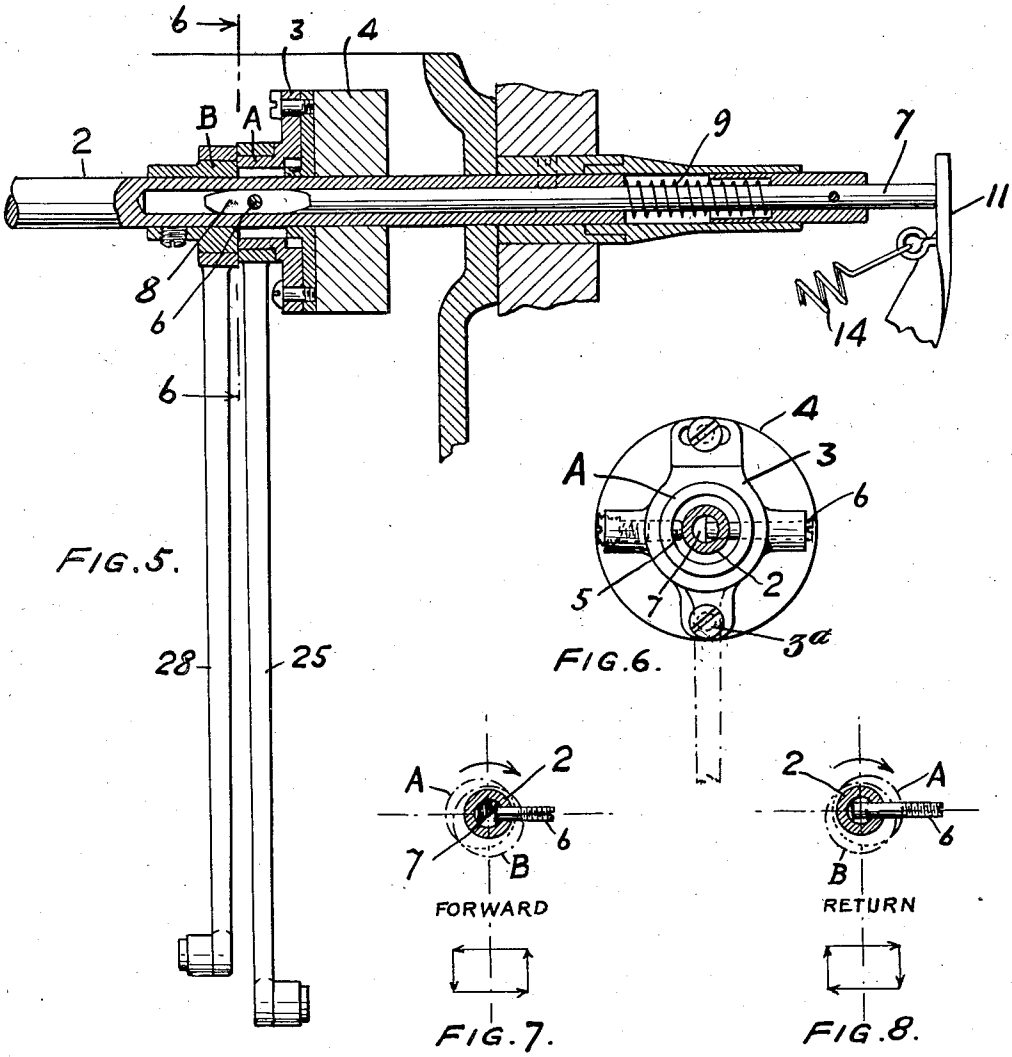


FIG. 5.

FIG. 6.

FIG. 7.

FIG. 8.

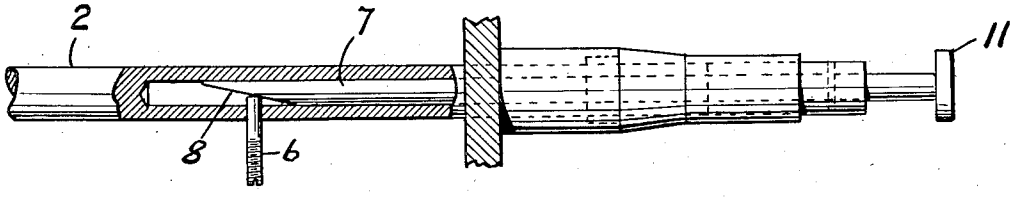


FIG. 9.

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2,023,868

UNITED STATES PATENT OFFICE

2,023,868

SEWING MACHINE

Louis Orrill Bouchard, Philadelphia, Pa., assignor of one-half to Harry A. Rutenberg, Philadelphia, Pa.

Substitute for abandoned application, Serial No. 553,713, July 25, 1931. This application August 7, 1935, Serial No. 35,218

4 Claims. (Cl. 112—210)

My invention particularly concerns sewing machines of the kind constructed to sew both forwards and backwards, and in that connection, an important object of my invention is a control mechanism determining the direction of sewing so constructed or arranged that it may be manipulated by the operator so as to leave both hands free at all times for manipulation of the garment or cloth being sewed. Another object of my invention is to provide means for controlling the direction of sewing which will not interfere in any way with the turning over of the machine for oiling, and this is important because the high speed at which the machines are run requires frequent oiling and so facility and quickness of oiling are an important consideration. Other objects and advantages of my invention, in the particular embodiment thereof shown in the drawings, will be understood by those skilled in the art.

For attaining the objects of my invention, the latter consists in whatever is described by or is included within the terms or scope of the appended claims.

In the drawings:—

Fig. 1 is a front view in elevation showing parts of a reversible sewing machine and illustrating features of the invention.

Fig. 2 is a detail view, partly in section and partly in plan, drawn to an enlarged scale and showing parts appearing at the right in Fig. 1.

Fig. 3 is an inverted plan view showing the two rock shafts which effect the feed.

Fig. 4 is a view partly in section and partly in elevation showing the feed bars.

Fig. 5 is a view, principally in sectional elevation, illustrating means for reversing the direction of feed by the feed bars.

Fig. 6 is a sectional view taken on the line 6—6 of Fig. 5.

Figs. 7 and 8 are views, partly schematic, illustrating the reversal of the feed, and

Fig. 9 is a top or plan view partly in section and with parts omitted, of Fig. 5.

The machine in which my invention is embodied is of the lock stitch over edge or zig-zag type in which the needle vibrates, but as the construction of such type of machine is well known, no particular illustration and description thereof is necessary.

In the machine shown, the feed of the work is effected by two eccentrics, A and B, one of which reciprocates the feed foot or bar 1 horizontally and the other reciprocates it vertically, and to reverse the feed the relative angularity of the two eccentrics is changed by shifting the axis of one relative to the other and crosswise of the axis of revolution thereof, the one that is so shiftable being the eccentric A, revolution of the two eccentrics being produced by the horizontal shaft 2 which passes through the head or arm of the machine and on which they are mounted so as to be rotated thereby.

The eccentric B, which is the one that imparts vertical movement to the feed foot 1 is fixed to said shaft 2, and the other eccentric A, which imparts the horizontal motion to the feed foot, encircles the shaft loosely, there being a space between the interior of such eccentric and the exterior of the shaft, and it is connected with the shaft so as to be rotatable thereby by means of a carrier 3 mounted on the shaft and connected therewith by a disk-form head 4. The eccentric A, by its carrier 3, has a pivotal connection with the head or collar 4 at one side of, or eccentric to, the shaft 2 by the pivot screw 3a so that the eccentric may be swung on such pivot transversely of the shaft 2.

A spring pressed plunger 5, slidable radially in the carrier in the direction of swing of the carrier on the pivot screw, engages at its inner end the adjacent side of the shaft 2 and constantly exerts a pressure tending to swing the eccentric A to one side of the axis of the shaft 2. To shift the eccentric in the opposite direction, the carrier has a pin or stud 6 diametrically opposite the plunger 5 whose inner end passes through the wall of a tubular portion of the shaft 2 and in position to be engaged by a cam device in the form of a rod 7 slidable longitudinally in the tubular portion of the shaft 2 in position to engage the inner end of the stud 6 by an incline or bevel 8, so that by longitudinal movement of the rod 7 in opposite direction the stud 6 may be moved outward or inward. Such movements of the rod 7 are under the control of the sewing machine operative by operating means situated below the sewing machine table, and which preferably include a treadle mounted on the floor beneath the sewing machine in position to be engaged by the foot of the operative, and thus shifting of the eccentric A to reverse the direction of sewing may be accomplished by the operative without the use of her hands which are accordingly left free, for the handling of the cloth or garment being sewed, by such manipulation by the hands as is usually required in sewing.

The rod 7 is movable in one direction by a coil spring 9 that encircles it for a portion of its

length, which at one end bears against the outer end of the tubular portion of the shaft 2 and at the other end engages a shoulder or collar fixed to the rod 7, and thereby the spring tends to shift the rod 7 outward. Beyond the spring 9 the end of the rod 7 is exposed outside the machine head and such end has contact engagement with one arm 11 of a bell crank lever whose other arm 12 has contact engagement with the upper end of the vertical rod 13, such contact engagements of the two arms being produced by a coil spring 14, one end of which is attached to the arm 11 and the other to the machine head. The spring 14 has greater strength than the spring 9 so that when free to do so the spring 14, through the lever arm 11, moves the rod 7 against the pressure of the weaker spring 9.

The lower end of the rod 13 has a bearing contact with one arm of a lever 15 pivoted between its ends to a bracket on the under side of the machine table, and passing vertically through the other end of such lever 15 is a vertical rod 16 whose lower end is pivotally connected to the treadle 17, hereinbefore mentioned. On the rod 16 is a collar 18, which when the treadle is depressed and the rod 16 is moved downward, engages the adjacent end of the lever 15 and, swinging the latter, it moves the rod 13 upward and rocks the bell crank lever to carry its arm 11 away from the adjacent end of the rod 7, and freeing the spring 9 from the superior force of the spring 14, such spring 9 acts to move the rod 7 outward to change the bearing point on stud 6 of the bevel or cam 8.

Stops 21 and 22 are provided on opposite sides of the bell crank lever arm 11 to limit the swing of such lever and said stops are slidable in holes 23 in a bracket 24 projecting from the machine head (on which the bell crank lever is pivoted). Adjustment of the stops may be effected by a screw 25a having right and left threads, which is swiveled to the bracket 24. These adjustable stops are provided for adjusting the feed.

On the upper end of the treadle rod 16 is a coil spring 19 whose upper end engages a bearing collar on the rod and whose lower end engages the end of the clutch lever 20 above the collar 18 so that when the rod 16 is moved downward the clutch lever 20 will throw the clutch to start the machine for forward sewing. Further downward movement of the rod 16 results in reversing for backward sewing.

The revolution of the eccentric A, by a vertically extending rod 25 (see Fig. 5) in the hollow machine head or arm, rocks the shaft 26 (Figs. 3 and 4) having a crank 27 which reciprocates the feed foot horizontally. The eccentric B, by a rod 28, similar to the rod 25, rocks the shaft 29 which has a crank 30 that imparts up and down movement to the feed foot.

By reason of the mere contact engagement of rod 13 and arm 12 of the bell crank lever, when the machine head is swung backward on its hinge connection with the table 10, separation of 12 and 13 takes place and on returning the machine head or arm to working position the operative engagement of arm 12 and rod 13 is reestablished. Thus, nothing special requires to be done in the disconnection and connection of parts when oiling is required.

A machine embodying my invention may be used advantageously for many purposes, and when the embodiment is of the lock stitch or zig-zag stitch type it is especially advantageous in such work as sewing stars on flags and sewing tailor's pads, for that work can be very rapidly done, and an important feature contributing thereto is the leg operation by foot or knee of the undertable reversing control. I do not restrict myself to the particular embodiment of my invention illustrated in the drawings and described in detail herein, because my invention may be otherwise embodied and the scope of my protection is to be ascertained by reference to the appended claims.

The particular form and proportions of parts, as for example, variation in length of levers, will vary with different machines.

With regard to that feature of my invention which enables the shifting of the eccentric A to reverse the direction of sewing, which leaves the hands of the operative entirely free at all times, of course, it is not merely the location of the operating means below the table but it is such a form of such mechanism and such an arrangement thereof that a body member of the operative while at the machine may actuate an operating element which in the case shown in the drawings is the treadle 17.

I claim:—

1. A sewing machine having feed-reversing mechanism and a table, and control means for said reversing mechanism that includes an operator-actuated member below the table, said machine having a head that is shiftable to expose parts for oiling, and the control means including coacting members that have normally only contact engagement, one of which moves with the head.

2. A forward and reverse feed sewing machine adapted to be turned over for oiling, a table for said machine, an eccentric in said machine controlling the direction of feed, control means for said eccentric located beneath said table and extending therethrough, an abutting contact connection between said control means and said eccentric, a spring tending to maintain said contact connection in connection, and a foot operated treadle for said control means.

3. A forward and reverse feed sewing machine adapted to be turned over for oiling, an eccentric in said sewing machine controlling the direction of feed, a table for said sewing machine, means including a bell crank lever mounted above said table for controlling said eccentric, second means for controlling said eccentric located beneath said table and extending therethrough into abutting contact with said bell crank lever, a spring maintaining contact between said bell crank lever and said second mentioned means, and a foot treadle for operating said second and said first mentioned means and thereby operating said eccentric.

4. A forward and reverse feed sewing machine adapted to be turned over for oiling, an eccentric in said sewing machine controlling the direction of feed, a table for said sewing machine, control means for said eccentric mounted above said table, second control means for said eccentric mounted below said table and extending therethrough into abutting contact with said first control means, a spring maintaining contact between said first and said second mentioned control means, a foot operated treadle, and a lost motion connection between said treadle and said second mentioned control means.

LOUIS ORRILL BOUCHARD.