

Feb. 8, 1938.

C. S. THOMPSON ET AL

2,107,918

SEWING MACHINE

Filed Feb. 6, 1936

3 Sheets-Sheet 1

FIG. I-

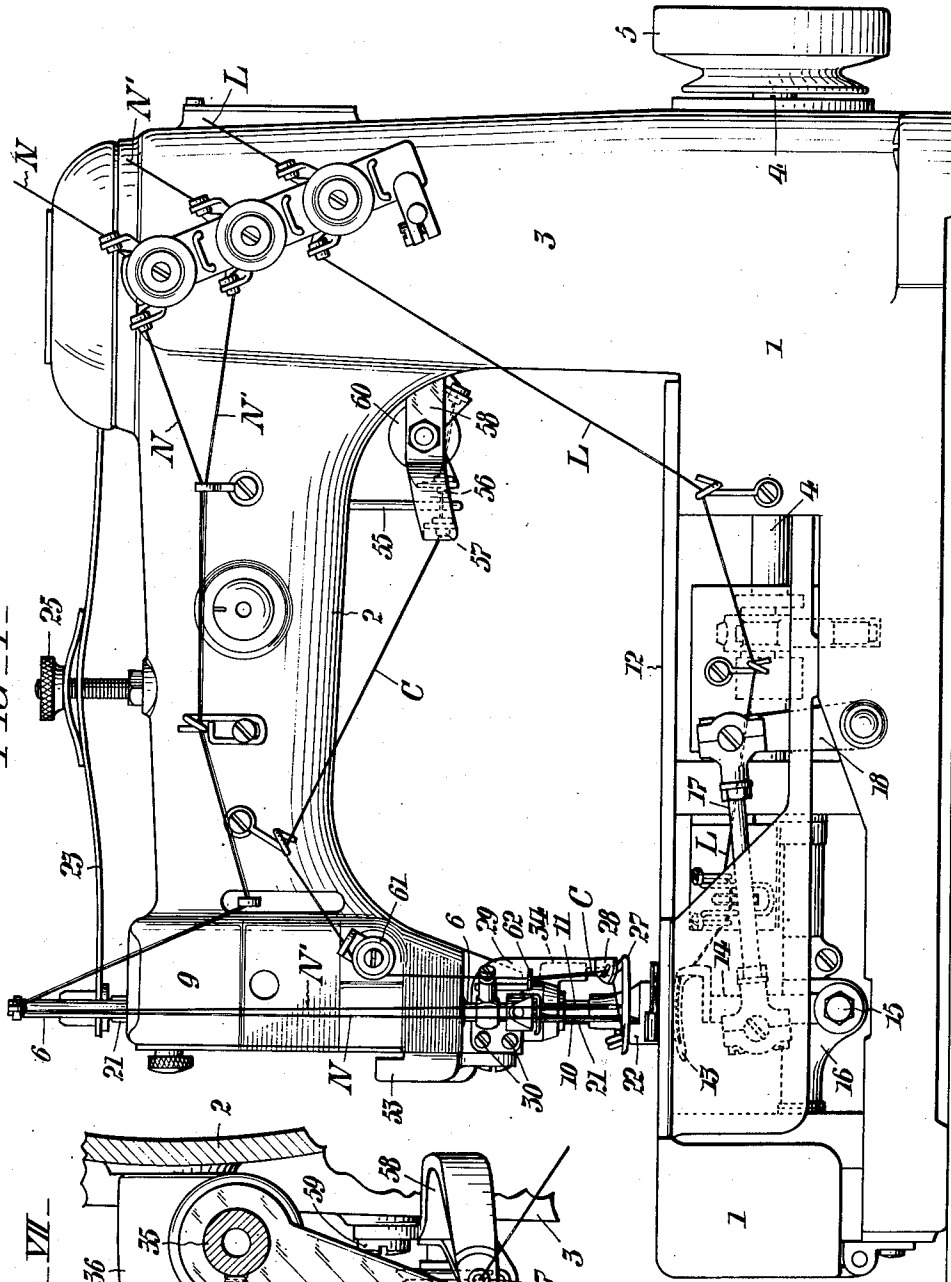


FIG. VII-

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Feb. 8, 1938.

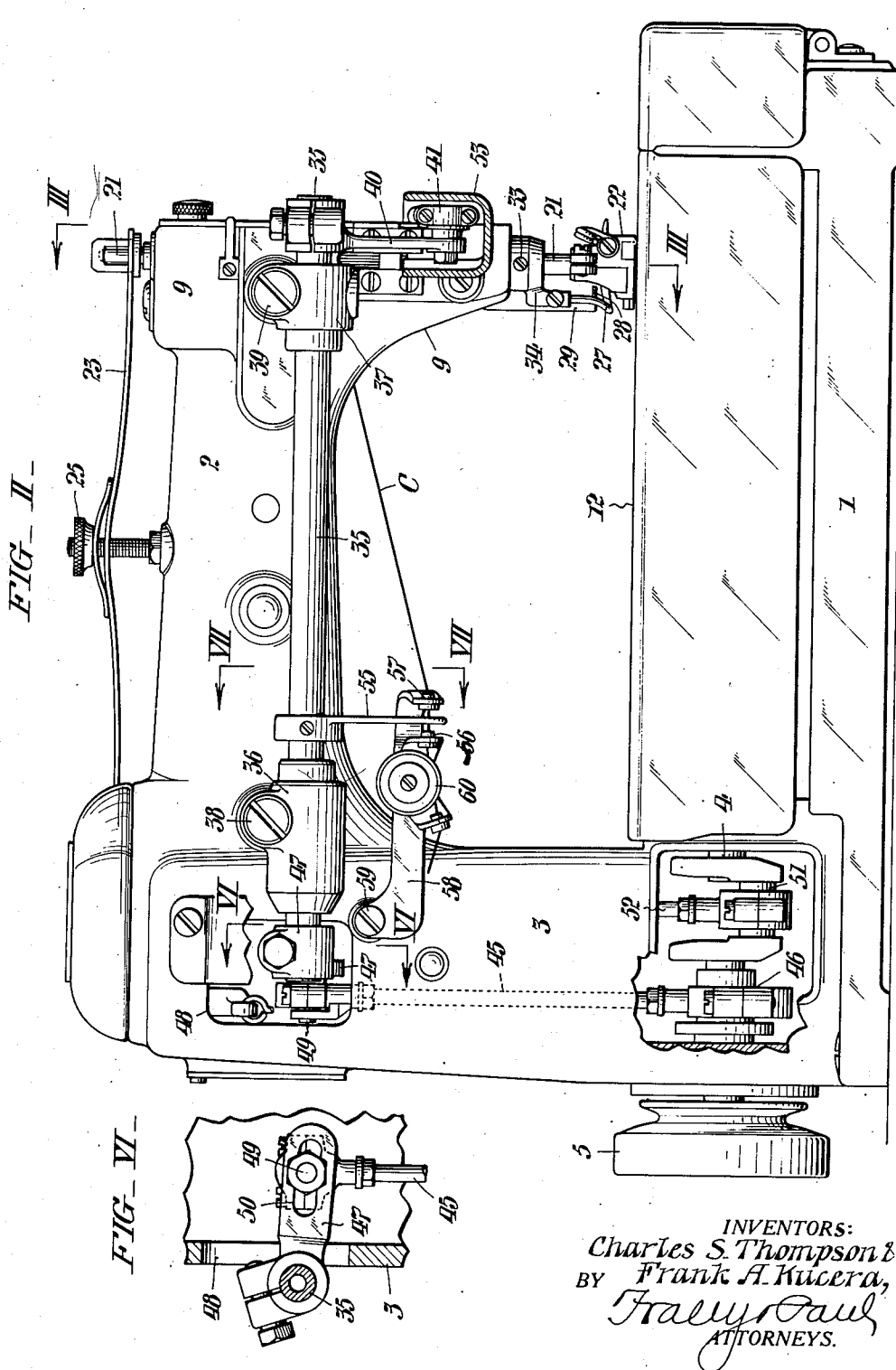
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FIG. III

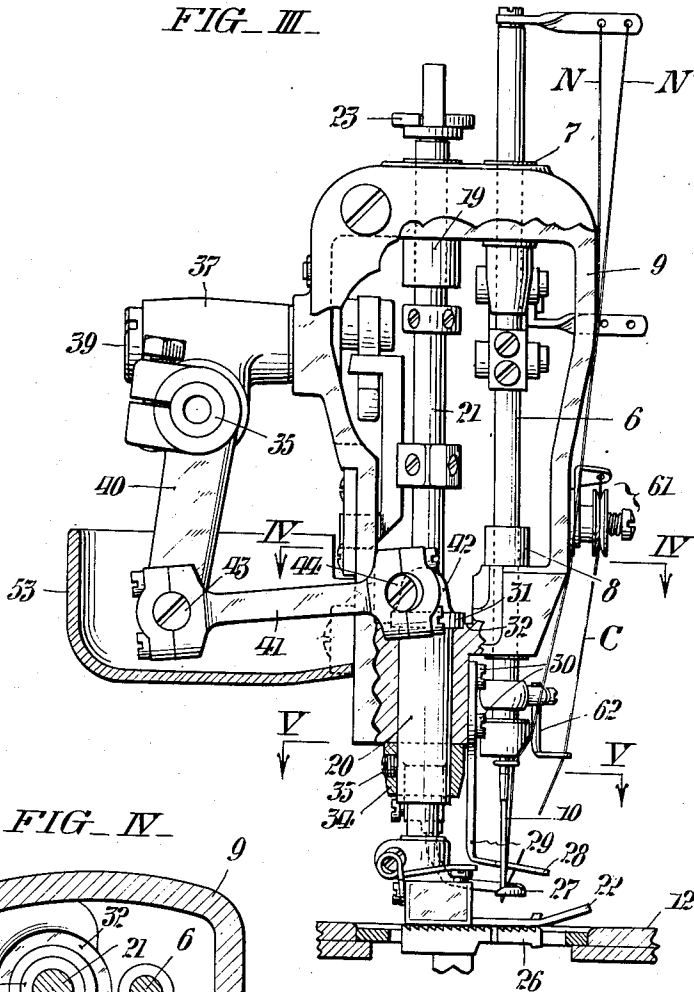


FIG. IV

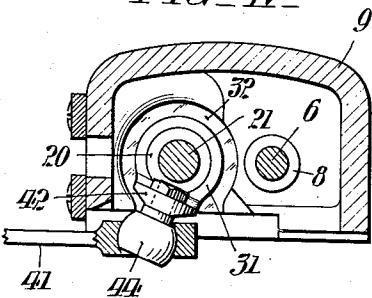
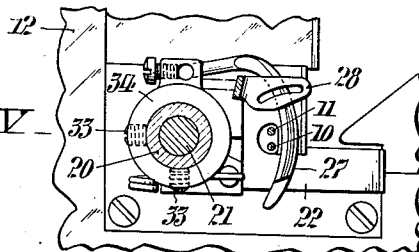


FIG. V



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UNITED STATES PATENT OFFICE

2,107,918

SEWING MACHINE

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Application February 6, 1936, Serial No. 62,570

9 Claims. (Cl. 112—100)

This invention relates to sewing machines; and it has reference more particularly to sewing machines of the type featured in U. S. Patent No. 1,405,855, granted to James R. Moffatt on February 7, 1922.

In machines of the type specifically referred to, multiple needles are employed to form parallel rows of stitches while a looper manipulates a thread to crosswise connect the needle thread loops at the underside of the fabric being sewed, and while another element manipulates a cover thread to similarly crosswise connect the needle thread loops at the upper side of the fabric.

In connection with such sewing machines, we aim to provide improved and simplified mechanism for actuating the cover thread manipulating element in timed relation with the needles and the looper, as well as incorporated means which can be relied upon to effectively take up the slack in the cover thread and thereby pre-assure a tight and firm crosswise connection of the needle loops at the corresponding side of the fabric.

Other objects and attendant advantages will appear from the following detailed description of the attached drawings, wherein Fig. I shows a front elevation of a sewing machine conveniently embodying our invention.

Fig. II shows the machine in rear elevation with portions of its frame broken away to expose important parts which would otherwise be hidden.

Fig. III is a fragmentary view, partly in elevation and partly in section, taken as indicated by the arrows III—III in Fig. II and drawn to a larger scale.

Figs. IV and V are fragmentary detail sectional views on a still larger scale taken as respectively indicated by the arrows IV—IV and V—V in Fig. III.

Fig. VI is an enlarged fragmentary detail sectional view taken as indicated by the arrows VI—VI in Fig. II; and

Fig. VII is likewise an enlarged fragmentary detail sectional view taken as indicated by the arrows VII—VII in Fig. II.

The sewing machine herein illustrated for convenience of exemplifying our invention, comprises a hollow base 1 which is overhung by an arm 2 extending horizontally from an integrally formed standard 3 rising from said base at one end thereof. Extending longitudinally through the hollow base and suitably journaled therein is a rotary main shaft 4 of the machine, which, at the right hand or protruding end has mount-

ed upon it a combined hand and belt wheel 5 whereby the machine can be driven either manually or by power. The needle bar of the machine, indicated at 6, is confined to endwise reciprocation by upper and lower guide bushings 7 and 8 (Fig. III) set into a head 9 at the end of the overhanging arm 2, and at its lower end carries two needles 10 and 11 (Fig. I). Cooperating with the needles 10 and 11 below the top or work supporting surface 12 of the hollow base 1 is a looper 13 (Fig. I) whereof the carrier arm 14 is fulcrumed at 15 to a rocker 16 which is actuated, through suitable connections (not illustrated), from the main shaft 4 to impart the needle avoiding movements to said looper. By means of a horizontal link 17, the carrier arm 14 is coupled with an oscillating arm 18, which, in turn, is actuated by suitable means (not illustrated) from the main shaft 4. Also confined to axial movement in upper and lower bushings 19 and 20 (Fig. III) set into the head 9, is a vertical presser bar 21, having a presser foot 22 secured to its lower end. A leaf spring 23 mounted on the top of the overhanging arm 2 and regulatable by means of a finger nut 25, exerts downward pressure upon the presser bar 21 whereby the presser foot 22 is maintained in yielding contact with the fabric (not illustrated) being sewed which is progressively advanced crosswise of the work support 12 by a feed dog shown at 26 in Fig. III. Like the looper 13, the feed dog 26 is operated from the main shaft 4 by concealed mechanism within the hollow of the base 1.

Cooperating with the needles 10 and 11 above the work support is a cover thread manipulating element 27 having a hook at its free end (Figs. I and V) to engage the cover thread C (Fig. I) as the latter emerges from the guide eye 28 in a pendant arm 29 secured by screws 30 to the lower end of the head 9. En route to the needles 10 and 11 and the looper 13 from individual sources of supply (not illustrated), the needle threads N, N' and the looper thread L pass through various tensions and guides shown in Fig. I after a manner commonly practiced in the art.

Coming now to those features with which the present invention is more especially concerned, the lower guide bushing 20 (Fig. III) for the presser bar 21 is rotatably mounted in the bottom of the head 9, and provided at its upper end with a circumferential retaining flange 31 which engages a bearing surface 32 within the hollow of said head. Affixed to the projecting bottom

end of the bushing 20 by set screws 33, is an arm 34 which carries the cover thread manipulating element 27 so that the latter, through oscillation of said bushing, swings back and forth about the axis of the presser bar 21 as a center. The means provided for imparting the required oscillatory movements to the sleeve 20 include a horizontal rock shaft 35 which extends longitudinally along the back of the overhanging arm 2 as shown in Figs. II and III, and which is journaled in spaced bearings 36 and 37 respectively secured, by means of screws 38 and 39 to said arm. Affixed to the forward end of the rock shaft 35 is a pendant arm 40 which, through a horizontal link 41, is coupled with an upstanding crank ear 42 on the top flange 31 of the oscillating bushing 20, the pivotal connections at 43 and 44 being of the ball joint type so as to allow universal movement at these points without attendant binding of the parts. The rock shaft 35 is actuated from the main shaft 4 through connections extending up and outward of the hollow standard 3, see Figs. II and VI. As shown, these connections include a vertical pitman 45 whereby a crank center 46 on the main shaft 4 is coordinated with an arm 47 which is secured to the rock shaft 35 at the left hand end in Fig. II and which reaches inwardly through an opening 48 in the back side of the standard 3. From Fig. VI it will be observed that the pivotal connection 49 for the top end of the pitman is adjustable along a longitudinal slot 50 in the arm 47 so that the rocking movement of the shaft 35 and, in turn, the swing of the cover thread manipulating element 27 can be varied. Immediately adjacent the crank 46 on the main shaft 4 is another crank 51, which, through another vertical pitman 52 also extending upward within the hollow of the standard 3, actuates means within the overhanging arm 2 for imparting the reciprocatory movements to the needle bar 6, the means just referred to having been omitted from the drawings since it forms no part of the present invention.

In order to avoid soiling of the work being operated upon in the machine, a trough 53 is provided for catching drip oil from the horizontal connecting link 41, said trough being secured to the end face of the head 9.

For the purpose of taking up the slack in the cover thread C, there is affixed to the rock shaft 35 a finger 55 (Figs. II and VII) which is adapted to engage said thread in the interval between a pair of guide eyes 56, 57 in a horizontal arm 58 secured by a screw 59 to the back of the standard 3. The arm 58 also carries a regulatable tension device 60 by which restraint is placed upon the cover thread C before passing through the eyes 56 and 57. As shown in Fig. I, there is also provided a tensioning device 61 on the head 9 whereby additional drag is induced in said yarn before it passes, by way of a directional guide 62 carried by the needle bar 6 to the guide 28 hereinbefore referred to.

During the operation of the machine, the hook element 27 is oscillated back and forth in a horizontal plane past the needles 10 and 11 by motion derived from the main shaft 4 through the rock shaft 35 and the interposed connections, and in so doing, manipulates the cover thread C in substantially the same manner as described in the Moffatt Patent No. 1,405,855. At the same time, the finger 55, by intermittently engaging the cover thread C in the interval between the fixed guide eyes 56 and 57, takes up the slack of said thread during the retractive or idle strokes of the manipulating element 27 whereby the needle

thread loops are tightly connected crosswise at the top side of the fabric being sewed. The amount of thread absorbed during each actuation of the finger 55 may obviously be varied by angularly adjusting the latter on the rock shaft 35.

From the foregoing it will be apparent that we have provided a cover thread laying mechanism, with an incorporated slack take-up, which is simple in construction, easily assembled and adjusted, and which moreover can be relied upon for perfect performance over protracted periods without requiring attention except for occasional oiling.

Having thus described our invention, we claim:

1. In a sewing machine, a work support with an overhanging arm; a vertical needle bar; a vertical presser bar rearward of the needle bar in the line of feeding, both the needle bar and the presser bar being confined to axial movement in a head at the end of the overhanging arm; a guide bushing for the presser bar journaled for oscillation in said head; a looper below the work support adapted to cooperate with a plurality of needles on the needle bar; a cover thread manipulating element operating in front of the needle bar and adapted to cooperate with the needles above the work support, said element being carried by the bushing aforesaid; and means for oscillating the bushing to effect actuation of the cover thread manipulating element.

2. In a sewing machine, a work support with an overhanging arm; a vertical needle bar; a vertical presser bar rearward of the needle bar in the line of feeding, both the needle bar and the presser bar being confined to axial movement in a head at the end of the overhanging arm; a guide bushing for the presser bar journaled for oscillation in said head; a looper below the work support adapted to cooperate with a plurality of needles on the needle bar; a cover thread manipulating element operating in front of the needle bar and adapted to cooperate with the needles above the work support, said element being carried by the bushing aforesaid; a rock shaft; and interposed connections whereby oscillatory movement is communicated from the rock shaft to the bushing to effect actuation of the cover thread manipulating element.

3. In a sewing machine, a work support with an overhanging arm; a vertical needle bar; a vertical presser bar rearward of the needle bar in the line of feeding, both the needle bar and the presser bar being confined to axial movement in a head at the end of the overhanging arm; a guide bushing for the presser bar journaled for oscillation in said head; a looper below the work support adapted to cooperate with a plurality of needles on the needle bar; a cover thread manipulating element operating in front of the needle bar and adapted to cooperate with the needles above the work support, said element being carried by the bushing aforesaid; a rotary shaft journaled beneath the work support; a rock shaft journaled on the overhanging arm and actuated from the rotary shaft; and interposed connections whereby oscillatory movement is communicated from the rock shaft to the bushing aforesaid to effect actuation of the cover thread manipulating element.

4. In a sewing machine, a work support with an overhanging arm extending horizontally from a hollow standard at one end of said work support; a vertical needle bar and a vertical presser bar both confined to axial movement in a head at the end of said overhanging arm; a guide

bushing for the presser bar journaled for oscillation in said head; a looper below the work support adapted to cooperate with a plurality of needles carried by the needle bar; a cover thread manipulating element adapted to cooperate with the needles above the work support, said element being carried by the bushing aforesaid; a horizontal rock shaft journaled along the exterior of the overhanging arm; a longitudinal main shaft journaled beneath the work support; connections extending up from the main shaft through and outward of the hollow standard for actuating the rock shaft; and interposed connections whereby oscillatory movement is communicated from the rock shaft to the bushing aforesaid to actuate the cover thread manipulating element.

5. In a sewing machine, a work support with an overhanging arm; a vertical needle bar; a vertical presser bar rearward of the needle bar in the line of feeding, both the needle bar and the presser bar being confined to endwise movement in a head at the end of the overhanging arm; a looper below the work support adapted to cooperate with a plurality of needles on the needle bar; a cover thread manipulating element fulcrumed for swinging movement about the axis of the presser bar and adapted to cooperate with the needles above the work support; a rock shaft; interposed connections whereby oscillatory movement is communicated from the rock shaft to the cover thread manipulating element; and a slack take-up means for the cover thread actuated from said rock shaft.

6. In a sewing machine, a work support with an overhanging arm; a vertical needle bar; a vertical presser bar rearward of the needle bar in the line of feeding, both the needle bar and the presser bar being confined to endwise movement in a head at the end of the overhanging arm; a looper below the work support adapted to cooperate with a plurality of needles on the needle bar; a cover thread manipulating element fulcrumed for oscillation about the axis of the presser bar and adapted to cooperate with the needles above the work support; a rock shaft; interposed connections whereby oscillatory movement is communicated from the rock shaft to the cover thread manipulating element; a pair of aligned guide eyes through which the cover thread passes enroute to the cover thread manipulating element; and a finger on the rock shaft adapted to engage the cover thread in the interval between the guide eyes in taking up the slack therein.

7. In a sewing machine, a work support with an overhanging arm; a vertical needle bar and a vertical presser bar both confined to endwise movement in a head at the end of the overhanging arm; a guide bushing for the presser bar journaled for oscillation in said head; a looper below the work support adapted to cooperate with a plurality of needles on the needle bar; a

cover thread manipulating element adapted to cooperate with the needles above the work support; said element being carried by the bushing aforesaid; a rotary shaft journaled beneath the work support; a rock shaft journaled on the overhanging arm and actuated from the rotary shaft; interposed connections whereby oscillatory movement is communicated from the rock shaft to the bushing to actuate the cover thread manipulating element; a pair of aligned guide eyes through which the cover thread passes enroute to the cover thread manipulating element; and a finger on the rock shaft adapted to engage the cover thread in the interval between the guide eyes in taking up the slack of said thread.

8. In a sewing machine, a work support with an overhanging arm extending horizontally from a hollow standard at one end of said work support; a vertical needle bar and a vertical presser bar both confined to axial movement in a head at the end of said overhanging arm; a looper below the work support adapted to cooperate with a plurality of needles carried by the needle bar; a cover thread manipulating element adapted to cooperate with the needles above the work support; a horizontal rock shaft journaled along the exterior of the overhanging arm; a longitudinal rotary shaft journaled beneath the work support; connections extending up from the rotary shaft through and outward of the hollow standard for actuating the rock shaft; interposed connections whereby oscillatory movement is communicated from the rock shaft to the bushing to actuate the cover thread manipulating element; and slack take-up means for the cover thread actuated from said rock shaft.

9. In a sewing machine, a work support with an overhanging arm extending horizontally from a hollow standard at one end of said work support; a vertical needle bar and a vertical presser bar both confined to axial movement in a head at the end of said overhanging arm; a looper below the work support adapted to cooperate with a plurality of needles carried by the needle bar; a cover thread manipulating element adapted to cooperate with the needles above the work support; a horizontal rock shaft journaled along the exterior of the overhanging arm; a longitudinal rotary shaft journaled beneath the work support; connections extending up from the main shaft through and outward of the hollow standard for actuating the rock shaft; interposed connections whereby oscillatory movement is communicated from the rock shaft to the cover thread manipulating element; a pair of aligned guide eyes through which the cover thread passes enroute to the cover thread manipulating element; and a finger on the rock shaft for engaging the cover thread in the interval between the guide eyes to take up the slack therein.

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