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TAKE-UP MECHANISM FOR SEWING MACHINES.

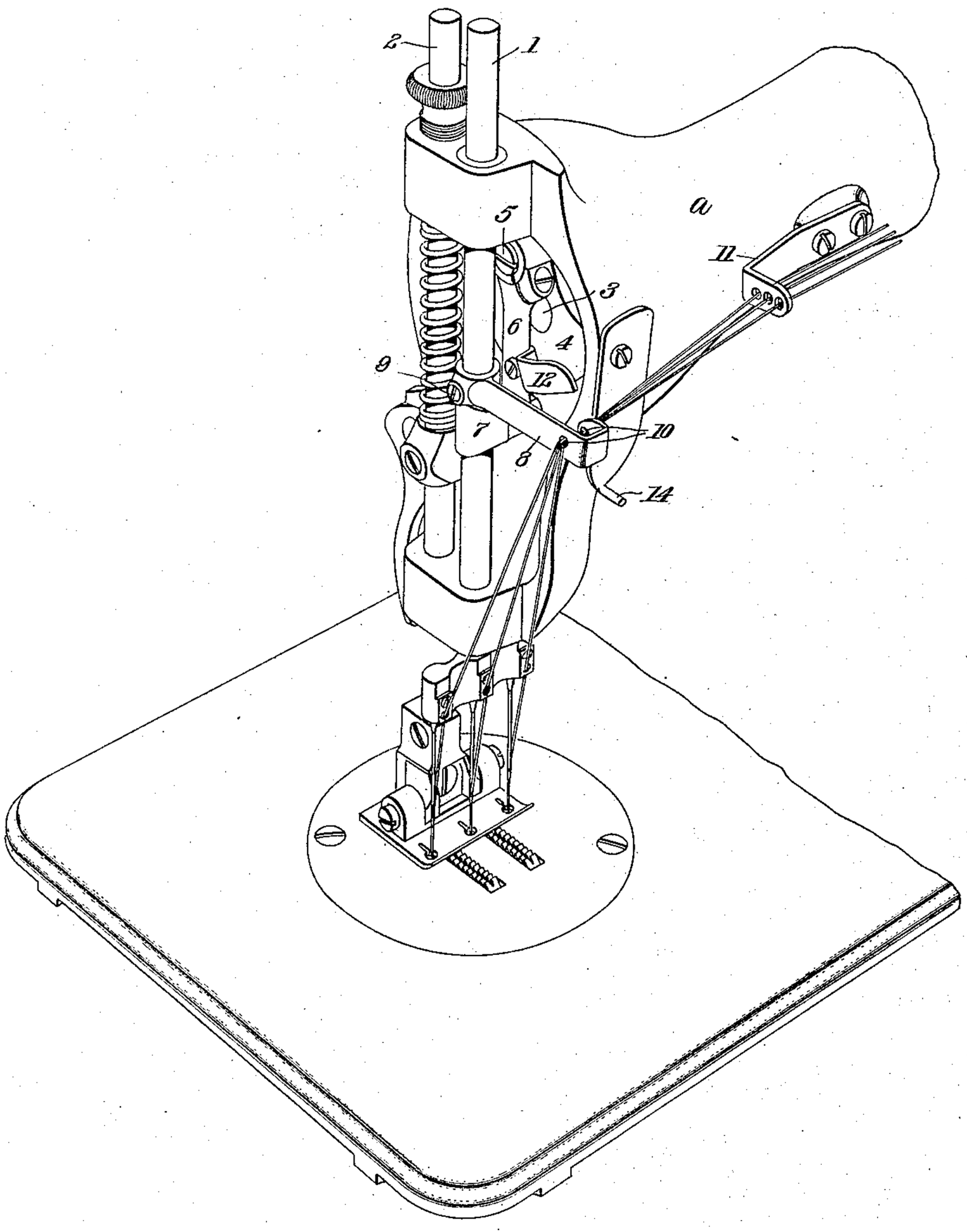
APPLICATION FILED MAY 16, 1913.

1,166,834.

Patented Jan. 4, 1916.

2 SHEETS—SHEET 1.

Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 2.

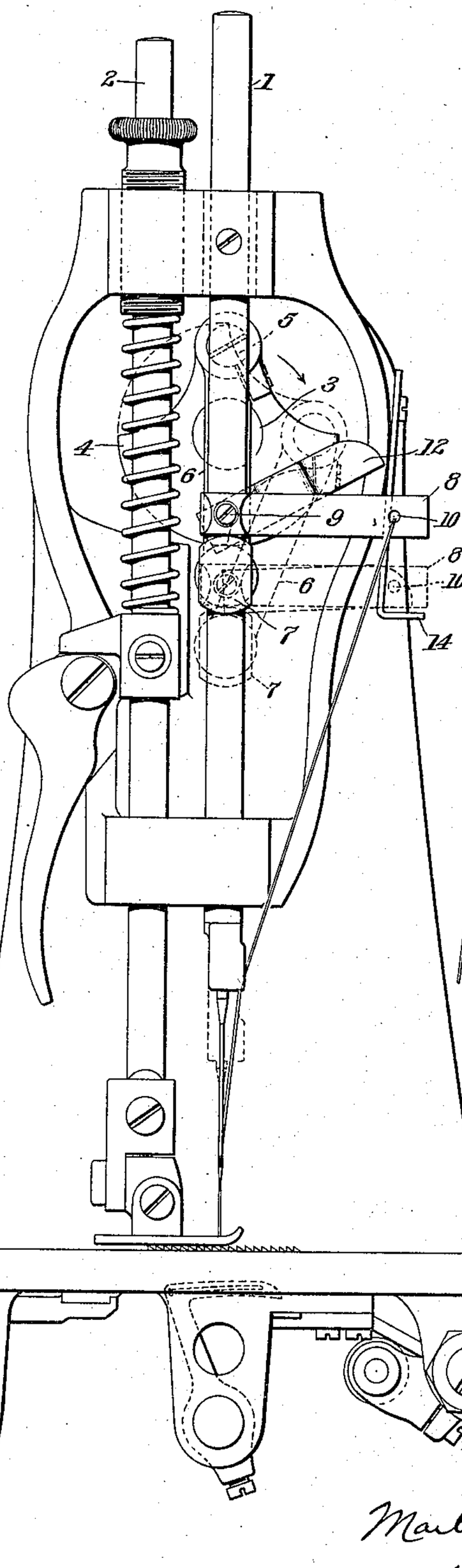

Fig. 3.

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MARTIN HEMLEB, OF ELIZABETH, NEW JERSEY, ASSIGNOR TO THE SINGER MANUFACTURING COMPANY, A CORPORATION OF NEW JERSEY.

TAKE-UP MECHANISM FOR SEWING-MACHINES.

1,166,834. Specification of Letters Patent. **Patented Jan. 4, 1916.**

Application filed May 16, 1913. Serial No. 767,976.

To all whom it may concern:

Be it known that I, MARTIN HEMLEB, a citizen of the United States, residing at Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Take-Up Mechanisms for Sewing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to an improvement in take-up mechanism for sewing machines, and more especially to means coöperating with the take-up arm to control the slack of the needle-thread during the slack forming movements of the take-up arm.

According to the present invention, the take-up arm is carried by the needle-bar which is operatively connected to the driving shaft by a link. The take-up arm is provided with means for guiding thread across the path of a slack-thread controller which is connected to said link and derives its operative movements therefrom. The slack-thread controller is normally maintained in a position above the take-up arm, and is given a downward operative movement simultaneously with the descent of the needle-bar and take-up arm, but at differential speed. By such movement the slack-thread controller engages the thread held across its path, and coacts with the take-up arm to draw up the slack thread.

In the drawings, Figure 1 is a perspective view of the bracket-arm of a sewing machine showing the take-up and slack-thread controlling elements in a position immediately prior to the descent of the needle-bar. Fig. 2 is a front elevation of the same showing in dotted lines the position of the take-up and slack-thread controlling elements at the end of the thread drawing action of the latter. Fig. 3 is a side elevation, showing in detail the position of said elements with respect to said thread immediately prior to the descent of the needle-bar.

The bracket-arm *a* of the sewing machine is provided with the usual bearings for needle-bar 1 and presser-bar 2. In the present instance the needle-bar is shown carrying a multiple needle-clamp in which are secured three eye-pointed needles. Within and longitudinally of the bracket arm is journaled driving shaft 3 having upon its forward end crank-plate 4, carrying crank-pin 5 embraced by one end of the link 6, which, at its opposite end, is connected with collar 7 fixed upon the needle-bar 1. Mounted upon the needle-bar immediately above said collar is the take-up arm 8, which is secured against movement upon said needle-bar by set-screw 9. The free end of the take-up arm is inturned or bent upon itself, said inturned portion being spaced from the main portion of said arm and provided with a thread-eye 10 directly opposite a corresponding thread-eye formed in the main portion of the arm.

Secured to the bracket-arm *a* is a thread-guide 11. The thread passes through the usual tension devices, through said thread-guide and thence to the take-up arm, passing through thread-eyes 10 of the latter to the needle or needles.

Upon the lower portion of link 6 is secured a slack-thread controller 12, which, in the present instance, is in the form of a rigid arm, the outer end of said arm extending in a plane parallel with the take-up arm 8, being adapted to operate in the space between the main portion of said arm and its inturned outer end.

The parts being in the position shown in Fig. 2, rotation of the driving shaft and its crank-plate 4 in the direction of the arrow, will move link 6 downward, causing descent of the needle-bar and take-up arm carried thereby. As the crank-disk continues to rotate, the link is carried beyond the dead center and thence in an upward path, causing the rise of the needle-bar and take-up arm to initial position. During the aforesaid movements of the needle-bar the operating end of the slack-thread controller 12 is given a movement in an elliptical path from the position shown by full lines in Fig. 2. As the needle-bar and take-up arm begin to descend, the operating end of the slack-thread controller is caused to move at a relatively greater speed, thereby engaging the thread held across its path by thread-eyes 10 of the take-up, and drawing the thread at this point. By such action the slack in the thread below the take-up arm is drawn up. The thread-drawing action of the slack-thread controller continues until the parts reach the position shown by dotted lines in Fig. 2. From such position the slack-thread controller and take-up arm move at substan-

tially the same speed, maintaining the pull upon the thread, until the thread meets stitch-setting pin 14. At this point the link in its movement swings the operating end of slack-thread controller 12 upwardly, the needle-bar continuing its descent until crank-pin 5 carries link 6 over the dead center and the link commences its upward movement carrying the parts to their initial position. It will thus be seen that the slack controlling member operates to take up the slack thread given up by the take-up arm in the slack giving period of its descending movement.

The construction above described avoids serious defects present in the wellknown forms of rotary cam take-ups or slack-thread controllers, which do not act uniformly upon different threads varying in thickness and finish, and which create considerable friction through their action upon the thread. Another defect of such take-up mechanisms is their thread winding action upon broken threads. By providing non-rotary means coöperating with the take-up to draw up slack produced during the slack-giving action of the take-up, the construction herein described is free from any of the above defects, inherent with rotary cam take-up mechanisms.

Having thus set forth the nature of the invention, what I claim herein is:—

1. In combination with stitch-forming mechanism, including a needle bar, a driving shaft, a link connecting said shaft and the needle bar, a take-up arm carried by said needle bar comprising means for guiding thread across the operative path of a slack-thread controller, and a slack-thread controller carried by said link to move downward with said take-up arm but at differential speed, whereby the thread below said take-up arm is maintained free from slack during the descent of the needle bar.

2. In combination with stitch-forming mechanism, including a needle bar, and a driving shaft, a take-up arm carried by said needle bar comprising means for guiding thread across the path of a slack-thread controller, a link connecting said shaft and the needle bar, and a slack-thread controller carried by said link normally above the take-up arm and having an operative movement downward with said take-up arm during the descent of the needle bar.

3. In combination with stitch-forming mechanism, including a needle bar and a driving shaft, a take-up arm carried by said needle bar comprising means for guiding thread across the path of a slack-thread controller, a link connecting said shaft and the needle bar, and a slack-thread controller carried by said link to move in a downward operative path simultaneously with the descent of said take-up arm and co-acting with the latter to maintain the thread below the same free from slack during the descent of the needle bar.

4. The combination with stitch-forming mechanism, including a needle bar and a driving shaft, of a link connecting said needle bar and shaft, a take-up arm carried by said needle-bar and having its free end inturned and provided with thread-eyes serving to guide thread across the path of a slack-thread controller, and a slack-thread controller rigidly secured to said link and having a downward operative movement for coaction with said take-up arm simultaneously with the descent of the needle-bar.

5. In combination with stitch-forming mechanism, including a needle-bar, a driving shaft, a link connecting said shaft and the needle-bar, a take-up arm carried by said needle-bar, and a vibratory slack-thread controlling element connected with said shaft and coöperating with said take-up arm to maintain the thread below said take-up arm taut throughout the descent of the needle-bar.

6. In combination with stitch-forming mechanism, including a needle-bar, a driving shaft, a link connecting said shaft and the needle-bar, a take-up arm carried by said needle-bar, and a vibratory slack-thread controlling element connected with said shaft and coöperating with said take-up arm during its slack giving action to take up the slack thus produced.

7. In combination with stitch-forming mechanism, a driving shaft carrying a crank-pin, a link connected at one end with said crank-pin and having its other end confined to rectilinear movement, and coacting take-up and slack-thread controlling arms deriving from said link differential operative movements in adjacent paths, one of which arms is rigidly connected with said link and the other indirectly connected with the latter.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

MARTIN HEMLEB.

Witnesses:
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