Oct. 16, 1923. 1,470,646

W. T. B. ROBERTS

SEWING MACHINE

Original Filed Nov. 17, 1916

Fig. 1

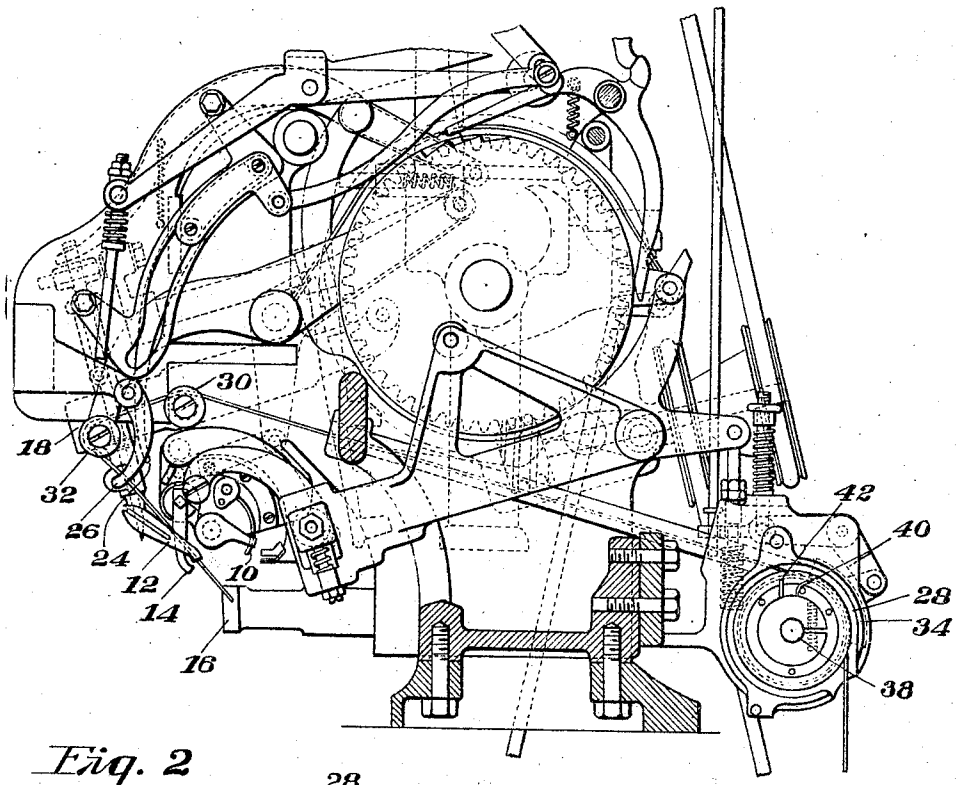


Fig. 2

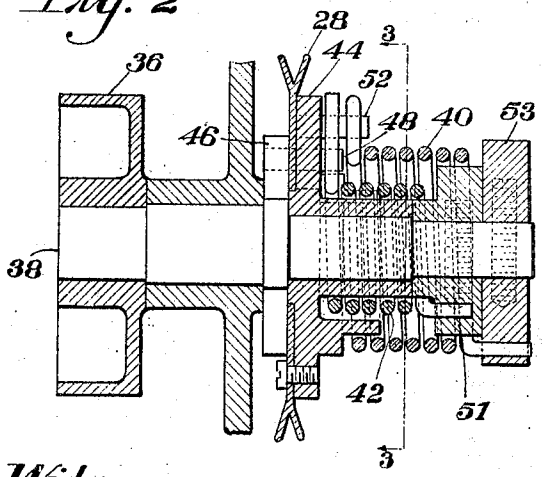
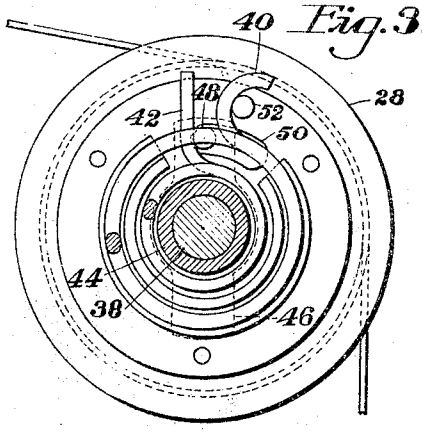


Fig. 3.



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UNITED STATES PATENT OFFICE.

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SEWING MACHINE.

Original application filed November 17, 1916, Serial No. 131,905. Divided and this application filed June 24, 1919. Serial No. 306,475.

To all whom it may concern:

Be it known that I, WILLIAM T. B. ROBERTS, a subject of the King of Great Britain, residing at Leicester, in the county of Leicester, England, have invented certain new and useful Improvements in Sewing Machines; and I do hereby declare the following to be a full, clear, 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.

This invention relates to sewing machines, particularly adapted for use in the manufacture of boots and shoes, of the type in which a thread to be drawn through the work is passed around a hooked or barbed needle by a looper, and is especially applicable to machines of the class known as welt and turn shoe sewing machines.

One object of the invention is to provide an auxiliary thread take-up device, which is combined with the usual tension-wheel device for sewing machines of the class indicated. Accordingly, one feature of the invention contemplates the provision in a sewing machine having stitch forming devices, of thread-handling devices including a thread tension, said tension being mounted to have an auxiliary take-up motion.

Other features of the invention consist in certain details of construction and combinations of parts, the advantages of which will be obvious to those skilled in the art.

The various features of the invention are illustrated in the accompanying drawings in which: Figure 1 is a view in side elevation partly in section of a welt and turn wax thread shoe sewing machine embodying the preferred form of the invention; Fig. 2 is a vertical sectional view of the improved thread tension; and Fig. 3 is a vertical section of the thread tension taken on the line 3—3 of Fig. 2.

The machine illustrated in the drawings is of the type illustrated and described in applicant's co-pending application, Serial No. 131,905, filed November 17, 1916, of which the present application constitutes a division. This machine in addition to being provided with the usual curved hook needle 10, looper 12, thread finger 14, work support 16, and main take-up 18, is provided with a looper re-threading device comprising a thread arm 24 and a thread clamp 26. As the thread passes to the sewing point, it runs over a thread tension wheel 28, around a thread truck 30 on the machine frame, and a thread truck 32 on the main take-up 18. A braking device is provided for the tension wheel comprising a brake shoe 34 which at the proper times acts on a brake drum 36 carried by a shaft 38 on which the tension wheel is mounted. The parts above described may be and preferably are the same as the corresponding parts of the machine illustrated and described in applicant's co-pending application hereinbefore referred to, to which reference may be had for a full and complete description of these and other parts of the machine not fully described herein.

Welt and turn shoe sewing machines are usually provided with an auxiliary take-up located between the thread trucks 30 and 32, but in the illustrated machine the usual auxiliary take-up is omitted, the thread arm 24 and thread clamp 26 operating in a position ordinarily occupied by the auxiliary take-up. To provide an auxiliary take-up movement for the thread, the thread tension in the illustrated embodiment of the invention is constructed to have the auxiliary take-up motion. The thread tension consists of the tension wheel 28 which is connected to the brake shaft 38 by means of two tension springs 40 and 42. The wheel 28 is attached to the flange of a sleeve 44 which is loosely mounted upon the shaft 38. A flange 46 is formed on the shaft 38 and carries a pin 48 which projects through a slot 50 formed in the wheel 28 and sleeve 44. One end of the spring 42 bears against the pin 48 and the other end of the spring is fixed in a collar 51 which is fixed on the shaft 38. One end of the spring 40 is fastened to a pin 52 mounted in the wheel 28 and sleeve 44, and the other end of the spring 40 is fixed in a collar 53 which is secured to the shaft 38. With the above construction the operation of the thread tension is as follows: When the brake 34 is removed from the drum 36 on the shaft 38, the tension wheel 28 will move freely with the shaft and the thread can be drawn off. When the brake is acting on the drum 36, a pull on the thread will tend to rotate the tension wheel relatively to the

shaft, first against the action of the spring 40 until the pin 52 has been moved into contact with the end of the spring 42, then against the action of both springs 40 and 42 until the end of the slot 50 in the tension wheel comes into contact with the pin 48. At this time the tension wheel will move with the brake shaft to give off thread. If slack thread is given by the stitch forming devices while the tension wheel is held by the springs 40 and 42, the thread will be taken up by the action of the springs. With this construction the thread tension, in addition to its usual operation, has a take-up motion similar to that usually produced by known forms of auxiliary take-up levers and associated spring buffers.

Although the improved thread tension is of special advantage in a machine employing a looper re-threading mechanism, obviously this thread tension may be embodied in almost any type of wax thread sewing machine.

The preferred embodiment of the invention having been thus described, what is claimed as new is:—

1. A sewing machine having, in combination, stitch forming devices including a hook needle, a looper, a thread arm, a positively actuated main take-up, and a thread tension mounted to have an auxiliary take-up action.

2. A sewing machine having, in combination, stitch forming devices, a tension wheel shaft, and a tension wheel mounted to rotate with said shaft in giving up thread, and also having a yielding movement relatively to said shaft.

3. A sewing machine having, in combination, stitch forming devices, a tension wheel shaft, a thread tension wheel rotatably mounted on said shaft, and means yieldingly connecting the tension wheel to the shaft to permit a yielding rotative movement on the shaft.

4. A sewing machine having, in combination, stitch forming devices, a tension wheel shaft, a thread tension wheel rotatably mounted on said shaft, a spring connection between the tension wheel and the shaft, and means for limiting the movement of the tension wheel relatively to the shaft.

5. A sewing machine having, in combination, stitch forming devices, a tension wheel, a shaft on which the tension wheel is mounted, means to control the movement of the shaft to give up the thread to the stitch forming devices, and a yielding connection between the tension wheel and shaft to permit the wheel to move relatively to the shaft and take up thread during the sewing operation.

6. A sewing machine having, in combination, stitch forming devices, a thread tension wheel, a brake to restrain the rotation thereof, and means permitting a yielding rotary movement of the wheel with relation to the brake.

7. A sewing machine having, in combination, stitch forming devices, a thread tension wheel mounted to have a movement under a strain on the thread, a stop for limiting said movement, a spring for imparting a return take-up movement to the wheel, and a brake for restraining the rotation of the wheel.

8. A sewing machine having, in combination, stitch forming devices, a thread tension wheel mounted to have a movement under a strain on the thread, a spring to restrain the last portion only of said movement, a spring to impart a return take-up rotary movement to the wheel, and a brake for restraining the rotation of the wheel.

9. A sewing machine having, in combination, stitch forming devices, a thread tension wheel mounted to have a yielding movement under a strain on the thread, additional means for yieldingly restraining the last portion only of said movement and to impart a return take-up movement to the wheel, and a brake for restraining the rotation of the wheel.

10. A sewing machine having, in combination, stitch forming devices, and a thread tension including a tension wheel over which the thread passes on its way from the supply to the stitch forming devices, said tension wheel being immovable laterally of its axis and having a take-up action.

11. A sewing machine having, in combination, stitch forming devices, a thread tension wheel mounted to have a movement under a strain on the thread, a spring to restrain the last portion only of said movement, a spring cooperating with the first mentioned spring to impart a return take-up movement to the wheel, and a brake for restraining the rotation of the wheel.

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