J. E. THAYER.

SHUTTLE TENSION DEVICE.

APPLICATION FILED DEC. 29, 1906.

974,309. Patented Nov. 1, 1910.

Fig. 1.

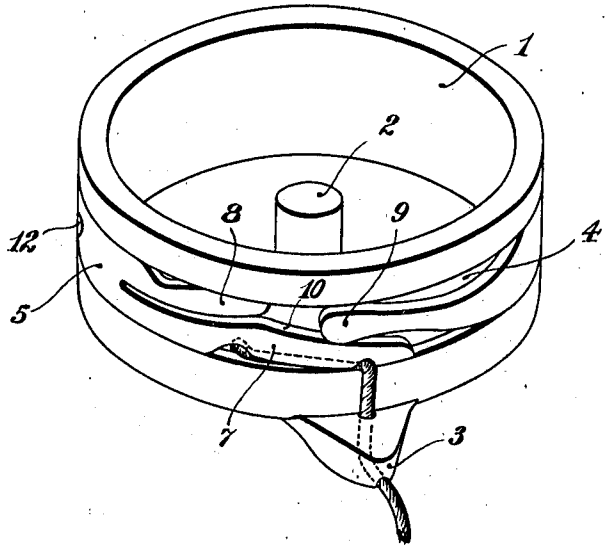


Fig. 2.

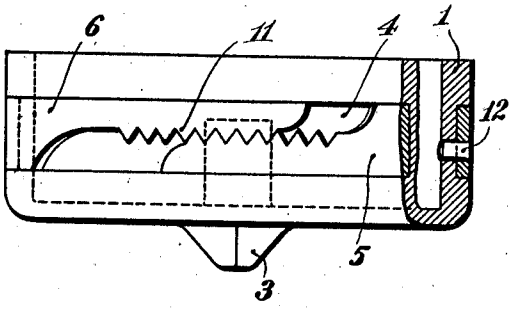
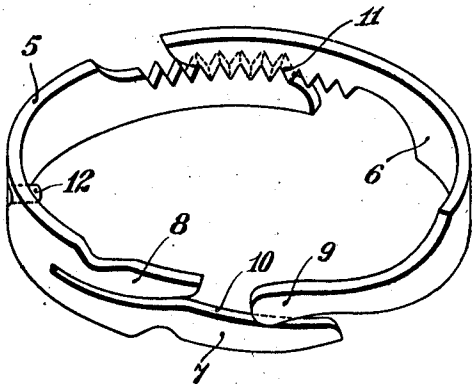


Fig. 3.



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UNITED STATES PATENT OFFICE.

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SHUTTLE TENSION DEVICE.

974,309. Specification of Letters Patent. Patented Nov. 1, 1910.

Application filed December 29, 1906. Serial No. 349,980.

To all whom it may concern:

Be it known that I, JOSEPH E. THAYER, a citizen of the United States, residing at East Bridgewater, in the county of Plymouth and State of Massachusetts, have invented certain new and useful Improvements in Shuttle Tension Devices; 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.

The object of the present invention is the improvement of the tension devices used in the shuttles of lock-stitch sewing machines, particularly in shuttles of the rotary or oscillatory type such as are used in shoe-sewing machines, in respect to durability and security of adjustment.

In the shuttles of certain well-known shoe-sewing machines the tension device comprises a resilient member or tension spring bearing at one end against the shuttle thread to subject it to frictional resistance, and adjusted by means of a small screw threaded into the spring and engaging the body of the thread case of the shuttle. As the space available for these parts is small the screw is very small and is easily broken or worn out, and a further difficulty is encountered in the constant tendency of the screw to turn and release the tension, necessitating frequent readjustment by the operator of the sewing machine and causing uneven work.

In the present invention the use of adjusting screws or other small or breakable parts is dispensed with, and the device is so constructed that after being adjusted no accidental change is possible, since the parts are locked in place by their position in the machine, and must be removed from the machine in order to be relatively moved.

Other novel and valuable features of the invention will be pointed out in connection with the description of the illustrated embodiment thereof.

In the drawings Figure 1 is a perspective view of a portion of a shuttle embodying the present invention; Fig. 2 is a plan view, partly in section; and Fig. 3 is a perspective view of the tension device detached.

The invention is shown as embodied in a shuttle of a well-known rotary or oscillatory type, and only the thread case of the shuttle is shown. The thread case comprises a circular body 1 provided with a bobbin spindle 2 and a thread-delivery nose 3. The body of the case is provided, in the usual manner, with a wide peripheral groove 4 for the reception of the tension device. The tension device comprises a thread-engaging member 5 and a tension-adjusting member 6 located in the groove 4 and consisting of flat strips of resilient metal curved to the form of the thread case, and each extending slightly more than half way around the thread case so as to be sprung into place and retain itself in position against the bottom of the groove. The thread-engaging member 5 has a reduced extremity 7 which engages the thread and presses it against a thread supporting surface on the thread case, as shown in Fig. 1, and is, in the present instance, resilient in itself so as to bear with constant pressure against the thread. A projection 8 at the same extremity of the member 5 affords a bearing against the thread case opposite to the point of engagement with the thread. The tension-adjusting member 6 has likewise a reduced, resilient extremity 9, which bears against the beveled upper surface 10 of the thread-engaging member, and increases the pressure of the latter against the thread.

The opposite extremities of the members 5 and 6 are provided with teeth 11 engaging each other and fixing the members in relative longitudinal position, and the member 5 is provided with a pin 12 entering a hole in the wall of the thread case to prevent displacement of the tension device in the groove. To adjust the tension it is necessary only to spring the toothed end of one of the tension members out of the groove, slide the member 6 the necessary distance in the groove, and then cause the toothed ends again to engage to lock the parts in adjusted position. In its adjusting movement the member 6 moves longitudinally about the periphery of the thread case in a direction at right angles to the direction of the pressure exerted on the thread. In this manner the extremity 9 of the member 6 is caused to engage a higher

or lower point on the inclined surface 10, so as to bear with more or less pressure thereagainst. After the thread case is inserted in its recess in the shuttle body, the toothed ends of the spring members cannot become disengaged, and the device is positively retained at the proper adjustment.

The device comprises only two parts, which are not liable to break or wear out, and it can be inserted in shuttles as at present constructed without alteration thereof, in place of the ordinary tension device above described.

The invention is applicable to shuttles and sewing machines of various kinds, and is not limited to the details of construction and operation of the illustrated embodiment.

Having now described the invention, what is claimed is:—

1. A shuttle tension for sewing machines having, in combination, a thread-supporting surface, a yielding thread-engaging member and a yielding tension-adjusting member engaging the thread-engaging member and pressing it against the thread, the members being relatively adjustable at substantially right angles to the direction of pressure to change their point of engagement and vary the tension, substantially as described.

2. A shuttle tension for sewing machines, having, in combination, with a circular thread case provided with a peripheral groove, a thread engaging member, and a tension adjusting member mounted in said groove and arranged to engage the thread engaging member, said tension adjusting member being longitudinally adjustable in said groove, substantially as described.

3. A shuttle tension for sewing machines, having, in combination, with a circular thread case provided with a peripheral groove, a thread engaging member and a tension adjusting member engaging the thread engaging member, said members being mounted in the groove so as to be capable of a relative longitudinal adjustment therein to vary the tension, substantially as described.

4. A shuttle tension for sewing machines having, in combination, a thread supporting surface, a tension spring engaging the thread, and a tension-adjusting spring engaging the tension spring, one of said springs being beveled at their point of engagement and the springs being adjustable longitudinally with respect to each other to vary the tension, substantially as described.

5. A shuttle tension for sewing machines, having, in combination, with a circular thread case, a thread engaging member, a tension adjusting member extending about the periphery of the thread case and arranged to engage the thread engaging member, said tension adjusting member being adjustable about the periphery of the thread case to vary the tension, substantially as described.

6. A shuttle tension for sewing machines having, in combination with a circular thread case provided with a peripheral groove, a thread-engaging member and a tension-adjusting member engaging said member near its thread-engaging extremity, the members being located in the groove in the thread case and encircling the thread case and having adjustably-interlocking ends to permit of their relative longitudinal adjustment to vary the tension, substantially as described.

7. A shuttle tension for sewing machines having, in combination with a circular thread case provided with a peripheral groove, a thread-engaging member curved to conform to the periphery and removably inserted in the groove, said member extending more than half way around the thread case to retain itself in said groove, substantially as described.

8. A shuttle tension for sewing machines having, in combination with a circular thread holder provided with a peripheral groove, a thread-engaging member and a tension adjusting member engaging the thread-engaging member, said members being curved to conform to the periphery of the thread case and removably inserted in the groove, being retained in place by the walls of the recess in which the thread holder is located, substantially as described.

9. A shuttle tension for sewing machines having, in combination with a circular thread holder provided with a peripheral groove, a thread-engaging member provided with a beveled surface on its thread-engaging portion, and a tension-adjusting member engaging said beveled surface, the members being curved to conform to the periphery of the thread case and being removably inserted in the groove, one of the members being longitudinally adjustable in the groove to vary the tension and the other being provided with means for preventing longitudinal movement, substantially as described.

10. A shuttle tension for sewing machines, having, in combination, with a circular thread case, a thread engaging member extending about the periphery of the thread case and a tension adjusting member also extending about the periphery of the thread case and arranged to bear upon the thread engaging member, said members being relatively adjustable about the periphery of the thread case to vary the tension, substantially as described.

11. A shuttle tension device for sewing machines, having, in combination, with a cylindrical thread case having a peripheral groove, a thread engaging member mounted in the groove, and a tension adjusting mem-

ber mounted in the groove and provided with a cam surface arranged to bear on the thread engaging member.

12. A shuttle tension device for sewing machines, having, in combination with a cylindrical thread case having a peripheral groove, a thread engaging member mounted in the groove, a tension adjusting member mounted in the groove and provided with a cam surface to bear on the thread engaging member, and means for locking the tension adjusting member in adjusted position.

In testimony whereof I affix my signature, in presence of two witnesses.

JOSEPH E. THAYER.

Witnesses:

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