F. ASHWORTH.

SHUTTLE TENSION DEVICE.

APPLICATION FILED JUNE 19, 1913.

1,128,651. Patented Feb. 16, 1915.

Fig. 1.

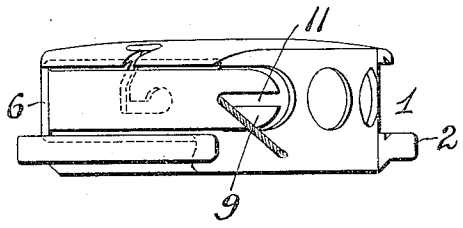


Fig. 2.

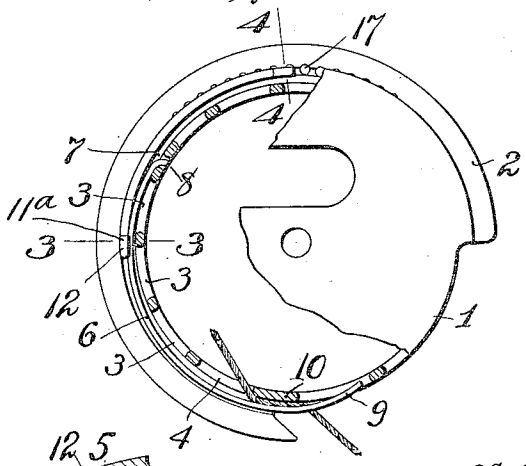


Fig. 3.

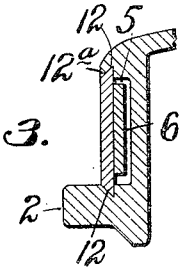


Fig. 4.

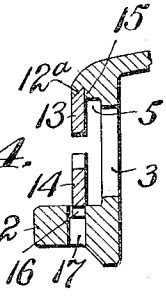
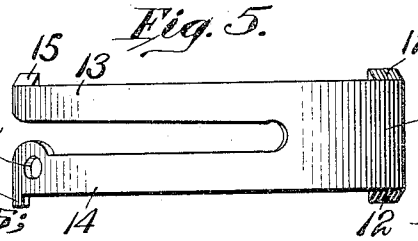


Fig. 5.



Witnesses:
K. D. McPhail
M. A. Hurley.

Inventor;
Fred Ashworth
by his attorneys
Phillips, Van Orsdel & Fish

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

FRED ASHWORTH, OF BEVERLY, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

SHUTTLE TENSION DEVICE.

1,128,651. Specification of Letters Patent. Patented Feb. 16, 1915.

Application filed June 19, 1913. Serial No. 774,724.

To all whom it may concern:

Be it known that I, FRED ASHWORTH, a citizen of the United States, residing at Beverly, in the county of Essex 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.

This invention relates to improvements in shuttle tension devices for use with shuttles of the oscillatory or rotary type, such as are employed in lockstitch shoe sewing machines.

The objects of the present invention are to produce a shuttle tension device for oscillatory or rotary shuttles which is simple, compact and durable, and which enables a fine adjustment of the tension to be secured, in which the tension may be quickly and easily adjusted without removing the tension devices from the shuttle, and in which the parts are securely locked in adjusted positions.

With these objects in view the invention comprises various novel and improved features pointed out in connection with the following description of the illustrated embodiment thereof and defined in the claims.

In the drawings, Figure 1 is a view of the thread case and the tension device applied thereto, taken on a plane substantially parallel with the axis of the thread case; Fig. 2 is a view of the thread case and tension devices taken on a plane substantially perpendicular to the axis of the thread case, showing a portion of the thread case in section; Fig. 3 is a fragmentary sectional view taken substantially on the line 3—3 of Fig. 2; Fig. 4 is a fragmentary sectional view taken substantially on the line 4—4 of Fig. 2; and Fig. 5 is a detail view illustrating the tension adjusting device detached from the thread case.

The invention is illustrated as applied to a shuttle substantially the same as that illustrated and described in the application of Fred Ashworth, Serial No. 585,116, filed October 3, 1910. Only the thread case of the shuttle is shown since this is considered sufficient to give a clear understanding of the invention.

The body of the thread case is cylindrical in form and comprises a circular wall 1 closed at one end and open at the other to receive the bobbin. The flange 2 extending partly about the thread case is provided to engage in the supporting groove in the inner surface of the rotary hook of the shuttle. The circular wall of the thread case is provided with a series of perforations indicated at 3 to lighten the same, and with an opening 4 through which the thread passes from the bobbin to the outer peripheral surface of the thread case. The cylindrical body of the thread case is formed with a peripheral groove indicated at 5 for the reception of the tension devices.

The tension devices comprise a thread engaging member 6 which engages the thread as it emerges from the thread case and presses it against the outer peripheral surface of said case, and a tension adjusting member 7 by means of which the tension exerted by the member 6 on the thread is adjusted. Both the thread engaging member 6 and the tension adjusting member 7 consist of flat strips of resilient metal curved about the periphery of the thread case and located in the peripheral groove 5. The member 6 is bent in a curve, the radius of which is somewhat less than the radius of the curvature of the bottom of the peripheral groove in the thread case, so that the portion of said member intermediate its end tends to assume a position out of contact with the bottom wall of the groove. Said member is provided with an inturned end indicated at 8 which engages in a suitable slot in the circular wall of the thread case and is thereby held from longitudinal displacement. The free end 9 of the thread engaging member 6 is arranged to press the thread against the outer surface of the portion 10 of the circular wall of the thread case, which surface forms a part of the bottom wall of the peripheral groove 5. The end 9 of the member 6 is bifurcated, forming a slot 11, as shown clearly in Fig. 1, to receive the thread after it passes from between the member 6 and the portion 10 of the thread case, and the thread is thereby held from being drawn laterally from beneath the member 6.

The tension adjusting member is arranged to bear at its forward extremity 11^a upon the outer face of the member 6 and is mounted for longitudinal movement in suitable

guides in the peripheral groove in the thread case so that the end 11^a of the tension adjusting member may be moved toward or from the free end of the thread engaging member 6 to vary the pressure exerted by the free end of the thread engaging member on the thread. The guides for the tension adjusting member preferably are constructed and arranged so that as the tension adjusting member is moved toward the free end of the member 6 the portion of the member 6 engaged by the tension adjusting member is pressed in toward the bottom wall of the groove 5 to increase the pressure exerted by the end 9 of the member 6 on the thread. The adjustment of the member 7 toward the free end of the thread engaging member increases the stiffness of the free end of the thread engaging member and this also tends to increase the tension. The construction of the tension adjusting member is illustrated particularly in Fig. 5. The forward portion 11^a of the tension adjusting member is provided with laterally projecting lugs 12 having inclined outer faces, so that the portion 11^a of said member is a dove-tail in cross section. These lugs fit in suitably shaped undercut grooves 12^a formed in the side walls of the peripheral groove 5. The grooves 12^a are formed substantially concentric or parallel with the bottom wall of the groove 5 in the thread case, so that as the tension adjusting member is adjusted toward the free end of the tension member, the intermediate portion of the thread engaging member engaged by the forward end of the tension adjusting member will be pressed in toward the bottom of the peripheral groove 5. The rear end of the tension adjusting member is bifurcated to form spring arms 13 and 14. The arm 13 of said member is provided with a laterally projecting lug 15 similar to the lugs 12, which engage in one of the undercut grooves 12^a. It will be evident that any change in the longitudinal position of the tension adjusting member in the peripheral groove in the thread case will produce a change in the tension.

In order to hold the tension adjusting member securely locked in adjusted position after the tension has been adjusted, the arm 14 of said member is formed with a projection 16 which is arranged to engage in any one of a series of holes 17 formed in the adjacent side wall of the peripheral groove 5. By the engagement of the projection 16 in one of the holes 17, the tension adjusting member is securely held from longitudinal displacement.

When it is desired to change the tension exerted by the thread engaging member 6, the operator inserts a tool in the hole 18 in the arm 14 of the tension adjusting member, springs said arm inwardly to withdraw the projection 16 from the hole 17 which it engages, and then moves the tension adjusting member longitudinally in the peripheral groove toward or from the free end of the thread engaging member 6 according as he desires to increase or decrease the tension. The tension adjusting member is held in its new position of adjustment by the engagement of the projection 16 in another of the holes 17. The holes 17 may be placed any desired distance apart, but are preferably located fairly close together so that the change in the position of the tension adjusting member equal to the distance between two adjacent holes will produce only a slight variation in the tension.

It will be apparent that by means of the tension devices above described a very fine and accurate adjustment of the tension may be secured. These devices are simple in construction, are compactly arranged in the shuttle, and may be relatively adjusted easily and conveniently without removing them from the shuttle. The parts when adjusted are securely locked in position so that they are not liable to be displaced while the machine is in operation.

Having explained the nature and object of the invention, and having described the preferred improvement thereto, what is claimed is:—

1. A shuttle tension device for sewing machines, having, in combination, a cylindrical thread case having a peripheral groove and a thread supporting surface on the bottom wall of said groove, a resilient thread engaging member having a curvature of less radius than that of the bottom of the groove and provided with a thread engaging end mounted in the groove, and a tension adjusting member mounted in the groove and bearing on the outer face of the thread engaging member, said members being relatively adjustable longitudinally of the groove to vary the tension.

2. A shuttle tension device for sewing machines, having, in combination, a cylindrical thread case having a circular wall, a peripheral groove and a thread supporting surface on the outer peripheral face of the circular wall, a resilient thread engaging member mounted in said groove and arranged to press the thread in a direction toward the interior of the thread case against the thread supporting surface of the circular wall, a tension adjusting member mounted in said groove and bearing on the outer face of the thread engaging member, said members being relatively movable longitudinally of the groove to vary the distance of the point of engagement of the tension adjusting member with the thread engaging member from the free end of the thread engaging member to regulate the tension.

3. A shuttle tension device, having, in combination, a cylindrical thread case having a peripheral groove and a thread supporting surface on the bottom wall of the groove, a thread engaging member extending peripherally about the thread case within the groove and having a resilient thread engaging end adapted to press the thread against the bottom of said groove, a movable tension adjusting member mounted in said groove and bearing on the outer face of the thread engaging member, guides on the thread case for said tension adjusting member constructed to guide the tension adjusting member peripherally of the thread case, said tension adjusting member being movable toward and from the thread engaging end of said thread engaging member to vary the tension.

4. A shuttle tension device, having, in combination, a thread case having a thread supporting surface, a resilient bow-spring member having a thread engaging end in opposed relation to the thread supporting surface adapted to press the thread toward said surface, a tension adjusting member arranged to bear on the outer face of the resilient member and movable longitudinally of said member in a path of less curvature than the curvature of said member to vary the pressure exerted by the thread engaging end of the resilient member.

5. A shuttle tension device, having, in combination, a cylindrical thread case having a peripheral groove and a thread supporting surface on the bottom wall of the groove, a resilient thread engaging member having a curvature of less radius than that of the bottom of the groove mounted in the groove, and a movable tension adjusting member mounted in the groove and bearing on the outer face of the thread engaging member, and guides for the tension adjusting member extending substantially concentric with the bottom wall of the groove and constructed to guide the tension adjusting member peripherally of the thread case.

6. A shuttle tension device, having, in combination, a cylindrical thread case having a peripheral groove, a thread engaging member mounted in said groove, a tension adjusting member bearing on the outer face of the thread engaging member, said tension adjusting member being movable longitudinally of the groove to vary the tension exerted by the thread engaging member, and co-acting means carried by the tension adjusting member and one of the side walls of the groove for locking the tension adjusting member in adjusted position.

7. A shuttle tension device, having, in combination, a cylindrical thread case having a peripheral groove, a thread engaging member mounted in said groove, a tension adjusting member mounted in said groove and bearing on the outer face of the thread engaging member, said tension adjusting member being movable longitudinally of the groove to vary the tension exerted by the thread engaging member and having a split extremity the arms of which engage the side walls of the groove, a tooth formed on one of said arms adapted to engage one of a series of openings in the adjacent side wall of the groove to lock the tension adjusting member in adjusted position.

8. A shuttle tension device, having, in combination, a cylindrical thread case having a peripheral groove, a thread engaging member mounted in said groove and extending peripherally about the thread case, a tension adjusting member located in the groove and bearing on the outer face of the thread engaging member, said tension adjusting member being movable longitudinally of the groove to vary the tension exerted by the thread engaging member, guides for the tension adjusting member formed in the side walls of the groove and extending concentric with the periphery of the thread case, said tension adjusting member having a split extremity the arms of which engage the side walls of the groove, a tooth formed on one of said arms adapted to engage in one of a series of openings in the adjacent side wall of the groove to lock the tension adjusting member in adjusted position.

FRED ASHWORTH.

Witnesses:
CHESTER E. ROGERS,
LAURA M. GOODRIDGE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."