

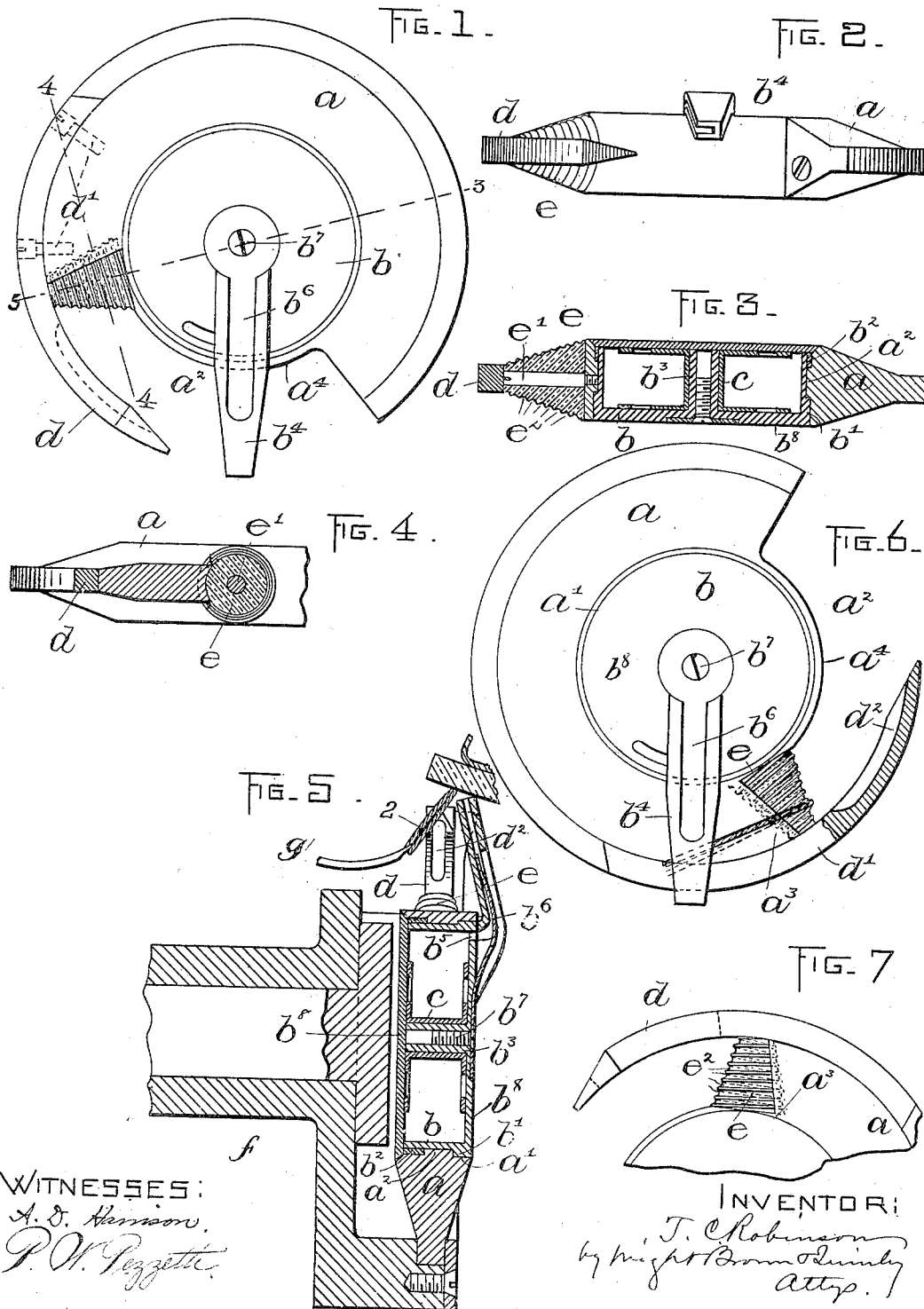
No. 649,759.

Patented May 15, 1900.

**T. C. ROBINSON.**  
**SHUTTLE FOR SEWING MACHINES.**

(Application filed Feb. 12, 1898.)

(No Model.)



WITNESSES:  
A. D. Harrison.  
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by *Wm. Brown* Atty.

# UNITED STATES PATENT OFFICE.

THOMAS C. ROBINSON, OF MALDEN, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO E. BAKER WELCH, OF CAMBRIDGE, MASSACHUSETTS.

## SHUTTLE FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 649,759, dated May 15, 1900.

Application filed February 12, 1898. Serial No. 670,018. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS C. ROBINSON, of Malden, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Rotary Shuttles for Sewing-Machines, of which the following is a specification.

This invention has relation to sewing-machines, and particularly to the shuttles which are employed therein. I have found by experience that the rotary or oscillatory shuttle as commonly constructed has a weakening and deleterious effect upon the needle-thread, whether it be waxed or not, because of the thread being dragged across the throat or that portion of the hook member which is at the base of the hook proper and extends between the hook and the shoulder after the hook has entered the loop; and hence the object of the invention is to provide the shuttle with means for preventing the wearing and weakening of the thread by placing upon the hook member at the base of the hook an antifriction device with which the thread may engage as it is drawn toward the center of rotation of the hook, and thereby to greatly increase the speed of the machines and obtain a much larger product than heretofore.

Reference is to be had to the accompanying drawings and to the letters and figures marked thereon, forming a part of this specification, the same letters and figures designating the same parts or features, as the case may be, wherever they occur.

Of the drawings, Figure 1 shows my improved shuttle detached in front elevation. Fig. 2 represents an edge view of the same. Fig. 3 represents a transverse section on line 3 3 of Fig. 1. Fig. 4 represents a section on line 4 4 of Fig. 1. Fig. 5 represents a sectional view of the shuttle in place on the driving portion of the machine, there being illustrated a portion of a shoe being sewed and a needle. Fig. 6 illustrates the loop of the needle-thread engaging the antifriction device on the hook. Fig. 7 represents the end of the hook as being beveled oppositely to that illustrated in Figs. 1 and 6.

Referring to the drawings,  $a$  indicates the body portion of the shuttle, which is formed with a central aperture  $a'$  to receive the box,

holder, or receptacle  $b$  for the bobbin  $c$ . It is formed with an internal flange  $a^2$ , with which a shoulder  $b'$  and a ring  $b^2$  on the periphery of the bobbin-box engage to hold the latter in place axially, though loose to turn therein. The box has a central stud  $b^3$  to receive the bobbin and has on its exterior a radially-projecting thread-guide or loop-check  $b^4$ , through a longitudinal groove in which the shuttle-thread passes from the bobbin, there being an aperture  $b^5$  in the bobbin-box for this purpose. A tension-spring  $b^6$ , secured in place by a screw  $b^7$ , passed into the stud  $b^3$ , bears against the shuttle-thread in the groove to furnish a sufficient resistance to the passage thereof. The bobbin-box and loop-check are held against rotation in the usual way by means not shown.

The shuttle has a hinged lid  $b^8$  mounted in the usual way, so that it may be lifted to insert a full bobbin, the hinge not being shown.

The rotary hook portion of the shuttle is beveled on both sides, so as to converge toward its outer edge, and is cut away at  $a^3$  to form a throat  $a^3$  to engage the loop of the needle-thread. The hook  $d$  is formed separately from the remainder of the hook portion of the shuttle and is secured in place by screws  $d'$  or other suitable fasteners, whereby it may be removed for the substitution of another one therefor. The inner edge of the hook is grooved, apertured, or slotted, as at  $d^2$ , to receive the point of the needle, though the location of the groove, aperture, or slot depends on the relation of the needle to the shuttle and whether the needle is curved or straight. The end of the hook is beveled, as shown in Fig. 6 or as in Fig. 7.

The throat  $a^3$  between the shoulder  $a^4$  and the hook of the shuttle at the base of the hook is concaved to partially receive an antifriction device consisting of a roll  $e$ , frusto-conical in shape and journaled on a screw-stud  $e'$ , arranged radially and threaded into the body of the hook portion  $a$ . The periphery of the frusto-conical roller is grooved spirally from end to end, as at  $e^2$ , for a purpose to be described.

The revoluble hook portion of the shuttle is mounted in the rotary sleeve  $f$ , which is rotated or oscillated by the ordinary devices,

(not shown,) and it is so arranged that when the needle  $g'$  draws a loop 2 through the work the hook enters the loop, and when the take-up (not shown) draws the needle-thread taut 5 the shuttle-thread is passed through the loop and a lock-stitch is formed in the usual way.

Heretofore when the hook entered the loop far enough to cause the throat at the base of the hook to engage the loop the continued 10 revolution of the shuttle caused the throat to draw more of the needle-thread through the work and the thread slid across the throat, so as to bear against the shoulder or curved portion  $a^4$  of the shuttle until the shuttle com- 15 pleted practically one rotation, when the take-up devices drew up the thread to make a tight stitch. This sliding of the thread across the shoulder weakened it and tended to unwind a portion thereof, so as to render it liable to 20 break when the take-up devices drew upon it, whereas it will be seen that in my improved shuttle the thread engages the smaller end of the frusto-conical roller lying in one of the grooves therein, and as the shuttle re- 25 volves the thread is drawn out and the roller is caused to rotate by the engagement of the thread therewith, and the thread is carried in the spiral groove from the end to the base of the roller by the rotation of the same. In 30 other words, enough thread is drawn out to cause the roller to rotate a sufficient number of times to carry the thread from end to end thereof. Hence the thread is not caused to slide over the throat to the shoulder, but is carried 35 or translated from the hook to the reduced portion  $a^3$  of the shuttle without being caused to unwind or become otherwise weakened. Hence the roller may be said to convey the thread from the hook without twisting, and 40 the walls of the grooves provide means for preventing the said twisting.

By providing the hook with the groove or slot  $a^2$  the barb of the needle enters therein,

so that the thread may be easily withdrawn therefrom. This may be accomplished by a 45 slight movement of the needle toward the hook after the loop has been drawn through, or else the needle may pause with its point and barb in the line of the groove.

While I prefer at present to employ a frusto- 50 conical roller, yet it may be seen that the antifriction device may be either cylindrical or concave or grooved or plain.

Having thus explained the nature of the invention and described a way of constructing 55 and using the same, though without attempting to set forth all of the forms in which it may be made or all of the modes of its use, I declare that what I claim is—

1. A shuttle having a hook, and an inde- 60 pendently-movable antifriction device for the loop between the shoulder and the point.

2. A shuttle provided with a hook and having a device in the throat for conveying the thread without twisting from the hook to the 65 shoulder.

3. A shuttle provided with a roller having its axis arranged to intersect the periphery of the shuttle, said roller being located be- 70 hind the point of the hook.

4. A shuttle having a hook member and having a spirally-grooved roller journaled therein behind the point of the hook.

5. A shuttle provided with a hook and with a frusto-conical spirally-grooved roller jour- 75 naled therein behind the point of the hook.

6. A circular shuttle cut away to form a shoulder and a hook, the said hook being grooved between its edges on its inner face to receive the point of the needle. 80

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

THOMAS C. ROBINSON.

Witnesses:

A. D. HARRISON,  
P. W. PEZZETTI.