

L. B. MILLER & P. DIEHL.  
Shuttle for Sewing-Machine.

No. 221,338.

Patented Nov. 4, 1879.

Fig. 1.

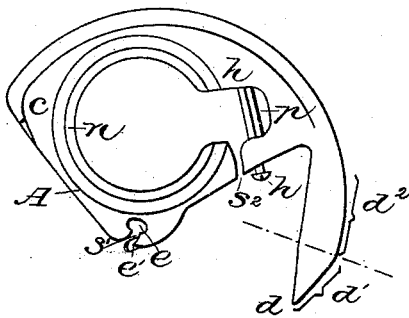


Fig. 2.

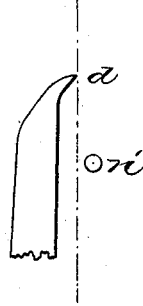


Fig. 3.

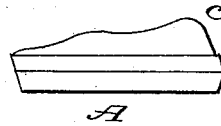


Fig. 4.

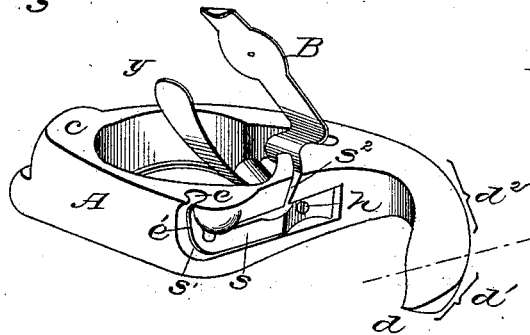


Fig. 8.

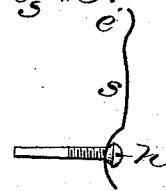


Fig. 5.

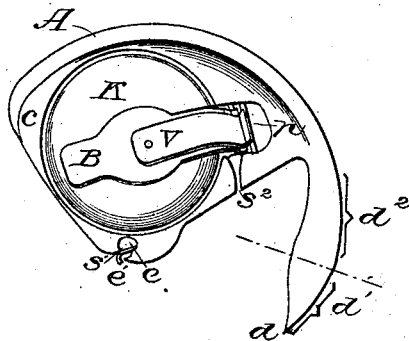


Fig. 6.

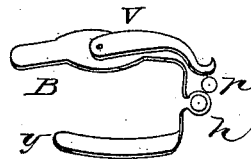


Fig. 7.



Witnesses:

A. B. Tompkins  
Wm. A. Winters

Inventor:

Lebens Baldwin Miller  
Phillip Diehl  
by their Atty Daniel F. Tompkins

# UNITED STATES PATENT OFFICE.

LEBBEUS B. MILLER AND PHILLIP DIEHL, OF ELIZABETH, N. J., ASSIGNORS  
TO THE SINGER MANUFACTURING COMPANY OF NEW JERSEY.

## IMPROVEMENT IN SHUTTLES FOR SEWING-MACHINES.

Specification forming part of Letters Patent No. **221,338**, dated November 4, 1879; application filed  
November 21, 1878.

*To all whom it may concern:*

Be it known that we, **LEBBEUS BALDWIN MILLER** and **PHILLIP DIEHL**, both of Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Shuttles for Sewing-Machines, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a plan of the body, beak, and beak-shank of an oscillating shuttle for a sewing-machine. Fig. 2 is an edge view of the beak of the shuttle, as shown at *d* and *d'*, Figs. 1, 4, and 5. Fig. 3 is an edge view of the body of the shuttle, showing a projection on one side, as at *c*, Figs. 1, 4, and 5. Fig. 4 is a perspective view of the entire shuttle. Fig. 5 is a plan of the entire shuttle. Fig. 6 is a perspective view of the U-shaped bobbin or cop-holder, to which is attached the spring V. Fig. 7 is a side view of a tension-spring, and Fig. 8 is an edge view of the tension-spring with the tension-screw connected therewith.

Similar letters of reference indicate like parts in all the figures.

The form in which our improvements are embodied is that of an oscillating shuttle with a beak and beak-shank; but the said improvements are not restricted to that particular form of shuttle, as the same may be applied to any oscillating shuttle or to a shuttle fitted to move in a straight shuttle-race.

The objects of our invention are to simplify the construction and manipulation of the shuttle, as connected with the bobbin and the thread, and also to render it more effective in operation.

In the Letters Patent of the United States granted to us under date of October 8, 1878, and numbered 208,838, an oscillating shuttle is shown, Figs. 9, 10, and 11, having a beak proper, whose office is to enter the loop of needle-thread, and a beak-shank which intervenes between the beak proper and the bobbin-case, and whose office is to hold the said loop while the needle is rising until the needle-eye is clear of the work being sewed, but without material elongation of the loop, so as to obviate the pulling of the thread downward through the needle-eye while it is in the work, and the great friction upon the thread incident to that mode of operation, and also having a bobbin-case the cavity of which is fitted with a cen-

tral pivot upon which the spool-bobbin revolves, the thread from the bobbin being guided to the thread-tension by an internal eye, through which it passes to the delivery-eye.

In the shuttle shown in the accompanying drawings, and now described, the said beak and beak-shank are retained, but the central pivot and the center of the bottom of the cavity of the shuttle are removed, leaving only a narrow strip or outer portion of the bottom as a rim or convexed bearing for the outer edge of the bobbin, thus forming an aperture through the shuttle and gaining space for a thicker bobbin or cop.

In the patent granted to us, before referred to, the delivery-eye of the shuttle is shown as placed at a short distance from the axis of oscillation of the shuttle, so that when the shuttle is retrograded the delivery-eye descends or moves from the work, exerting a pull upon the shuttle-thread to draw it home and finish the stitch; but as it is desirable to exert a still greater pull on the thread in the act of closing the stitch, the shuttle herein described has a projection or raised surface on one of its sides, so that in passing, at a particular junction of the retrograde movement of the shuttle, the projection or raised surface is brought in contact with the shuttle-thread, pressing it sidewise and tightening the stitch. In order that the bobbin or cop may be easily placed in or taken from the shuttle without the necessity of removing the shuttle from the machine, a swinging bobbin or cop holder is fitted to the shuttle, and so adjusted as to clasp and retain the bobbin or cop, and will open out from or close into the aperture of the shuttle, bearing the bobbin or cop with it, so that, when open, the bobbin or cop, by a single movement, may be slipped out of the holder or into place, as required.

The internal eye and the delivery-eye of the shuttle are each provided with a slit leading into them, through which the thread is slipped into the eye.

The tension-spring is sunk, as described in the said patent, in a recess in the periphery of the shuttle, and presses the thread between its inner surface and the bottom of the recess; but the free end of the spring is shaped and adjusted to rest in the slit of the delivery-eye, serving as a guide for the thread into or out

from the delivery-eye, and yielding sufficiently to the pressure of the thread to admit it into the delivery-eye; but, when the thread is in the eye, stopping the slit next to the eye, and preventing the thread from falling out.

In the drawings, A, Figs. 1, 4, and 5, is the shuttle, having the beak proper  $d'$ , and the beak-shank  $d^2$ , as in the shuttle described in said Letters Patent, but also having an aperture or opening through it, (shown in Figs. 1 and 4,) the central pivot and central part of the back being removed, retaining only a narrow strip or segment,  $n$ , Fig. 1, as a rim for the bearing of the bobbin or cop. The shuttle is further cut away near the butt of the beak, as clearly shown in Fig. 1, to afford space for the introduction and manipulation of the U-shaped bobbin or cop-holder B, Figs. 4, 5, and 6.

The extreme point  $d$  of the beak of the shuttle is bent or deflected, as shown in Fig. 2, in order to give room for the needle to pass the beak-shank, and yet permit the point of the beak to pass close to the needle  $n'$  in the act of catching the loop, as shown by the dotted line in Fig. 2.

C, Figs. 1, 3, 4, and 5, shows the projection or raised surface on the face of the shuttle, for the purpose of exerting, by lateral pressure, an additional pull upon the thread to tighten the stitch, as already described.

B, Figs. 4, 5, and 6, is the U-shaped bobbin or cop holder, to which is attached a spring, V. The holder is adapted to receive and hold the bobbin or cop, and is pivoted on the tension-screw  $h$ , Figs. 1, 4, and 8. The spring V bears upon the pin  $p$ , as shown in Figs. 5 and 6, so that the holder may be sprung out from the aperture in the position shown in Fig. 4, to deliver or receive the bobbin or cop without the shuttle being removed from the machine, or, having received the bobbin or cop, it may be closed into the aperture of the shuttle, as shown in Fig. 5. The inner limb, Y, of the holder supports the bobbin or cop on the interior side, and carries it out from the aperture when the holder is opened, and the spring V, bearing upon the pin  $p$ , retains the bobbin-holder in a fixed position, either opened or closed, as the case may be.

In place of the spring V there may be substituted a spring formed from a slip cut from the outer limb of the bobbin-holder, and adjusted to bear upon the pin  $p$ , substantially the same as described.

The delivery-eye for the thread is shown at  $e$ , Figs. 1, 4, and 5, and the slits to the delivery-eye and to the internal eye are shown at  $s'$  and  $s^2$ , Figs. 1, 4, and 5. The shuttle-tension spring shown at  $s$ , Figs. 4, 7, and 8, (Fig. 7 being a side and Fig. 8 an edge view of the spring,) is so shaped and adjusted as that, by means of the tension-screw  $h$ , Figs. 1, 4, and 8, the amount of pressure upon the thread may be regulated, and at the same time the free end  $e'$ , Figs. 1, 4, 5, 7, and 8, of the spring will rest in the slit  $s'$  of the delivery-eye, clos-

ing the same and preventing the thread from falling out.

It is obvious that in place of the tension-spring  $s$  a separate spring may be adjusted in the slit  $s'$  of the delivery-eye to prevent the thread from falling out of the eye.

To thread the shuttle it is only necessary to draw the thread through the slit  $s^2$ , Figs. 1, 4, and 5, whence it will slip to the internal eye at the terminus of the slit  $s^2$ , and thence under the tension-spring to the slit  $s'$ , and past the end of the spring  $e'$  into the delivery-eye.

We claim as our invention—

1. The shuttle for a sewing-machine, constructed substantially as before set forth, with a projection on its face, whereby, at a particular junction of the retrograde movement of the shuttle, in addition to the pull exerted from the delivery-eye by the movement of the shuttle, a lateral pressure is exerted on the thread, having the effect to tighten the stitch.

2. The shuttle for a sewing-machine, constructed substantially as before set forth, with the U-shaped bobbin or cop-holder, arranged to open out from or into the aperture of the shuttle, to deliver the bobbin or cop, or to return it to its place in the shuttle.

3. The shuttle for a sewing-machine, constructed substantially as before set forth, having a slit formed on one side of the shuttle, extending into the delivery-eye, with a spring arranged in the slit, past which the bobbin-thread may be drawn into or out of the delivery-eye, but when the thread is in the eye the spring will prevent it from falling out.

4. The combination, with the body of a shuttle for a sewing-machine, of the spring  $s$ , adjusted in a recess in the periphery of the shuttle-body, and shaped as described, so that it will operate as a tension on the bobbin-thread, and also as a stop in the slit of the delivery-eye to prevent the thread from falling out.

5. The shuttle for a sewing-machine, constructed substantially as before set forth, with the circular aperture or opening through it, having the beak  $d'$  and beak-shank  $d^2$ , and extreme point of the beak  $d$  bent or deflected, and also having the projection or raised surface  $e$ .

6. A shuttle for a sewing-machine having the circular aperture or opening through it, and having the beak  $d'$ , beak-shank  $d^2$ , and extreme point of the beak  $d$  bent or deflected, as shown, with the bobbin or cop holder B, substantially in the manner and for the purposes set forth.

7. The combination of the U-shaped bobbin or cop holder B, the spring V, and pin  $p$ , with the body of the shuttle, substantially in the manner and for the purposes described.

LEBBEUS BALDWIN MILLER.  
PHILLIP DIEHL.

Witnesses:

G. S. DAVIS,  
DANIEL F. TOMPKINS.