(No Model.)

F. P. CHENEY.

SHUTTLE.

No. 330,362. Patented Nov. 10, 1885.

Fig. 1.

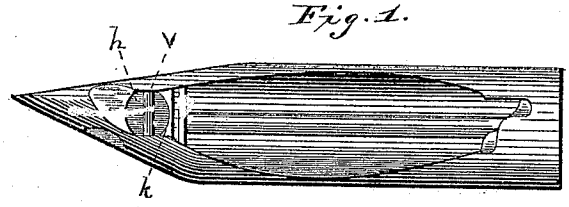


Fig. 2.

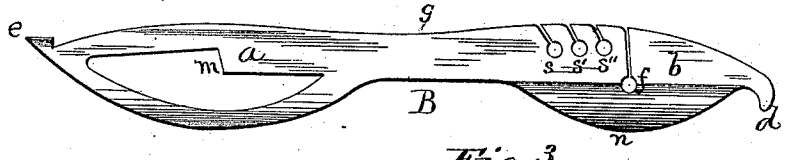


Fig. 3.

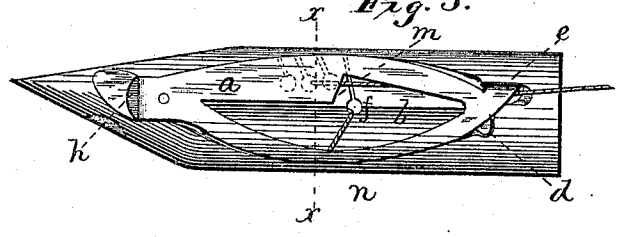


Fig. 4.

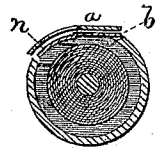
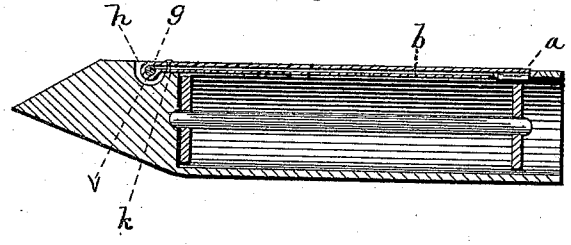


Fig. 5.



Witnesses.
Chas. R. Burr
Geo. D. Wyman

Inventor.
Frederick P. Cheney
By Myron L. Bax
his Att.

UNITED STATES PATENT OFFICE.

FREDERICK P. CHENEY, OF GLOVER, VERMONT.

SHUTTLE.

SPECIFICATION forming part of Letters Patent No. 330,362, dated November 10, 1885.

Application filed July 9, 1885. Serial No. 171,077. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK P. CHENEY, a citizen of the United States, residing at Glover, in the county of Orleans and State of Vermont, have invented certain new and useful Improvements in Shuttles, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to a shuttle to be used in sewing-machines; and it consists of a cylindrical shuttle with an elliptical opening in its top, through which the bobbin is introduced, and a two-leaved spring, in general form similar to the said opening, which it covers, compression between the two leaves of the spring causing the tension of the thread.

The object of my invention is to provide a shuttle of cylindrical form without projecting parts, one in which the tension is regulated in a precise and definite manner, as hereinafter more fully set forth, and one which occupies small space and is easily threaded, and in which abrasion of the thread is avoided. I accomplish these objects in the manner following.

In the drawings, Figure 1 is a top view of my shuttle-case with bobbin in position, but with the covering-spring removed. Fig. 2 is a view of the spring as struck from the sheet metal in process of manufacture. Fig. 3 is a top view of the shuttle, and shows the spring folded into shape and in position. Fig. 4 is a cross-section through the line *x x* of Fig. 3. Fig. 5 is a longitudinal vertical section of the shuttle.

The same letters of reference refer to like parts in the several figures.

In using the shuttle the bobbin is introduced from the top through the elliptical opening by first introducing its rear end through the widest part of the ellipse, then pushing it backward until the other end will drop down, and then pushing it forward to position. This manner of introducing the bobbin leaves the end of the thread outside the elliptical opening, doing away with the necessity for threading it through from the open rear end. The thread now comes out in the curved slot or opening between the curved edge *n* of the leaf *b* and the edge of the elliptical opening in the shell. It is now carried along the curved edge *n* until it engages with the projection *d*, when it is swung under the leaf *a* and along the upper surface of leaf *b* to the slit which leads to the central opening, *f*, of the leaf *b*, into which it is drawn, the end now being back again inside the shuttle. It is then carried to one of the slits leading to the circular openings *s s' s''* in the leaf *b*, the one into which it is drawn determining the tension, as hereinafter more fully described. It is then drawn straight to and beyond the rear of the shuttle, passing between the leaves from the point of last emergence—say, *s'*—to the offset *m*. Thence it runs along the top of the leaf *b*, free from all pressure, as the leaves between the points *d* and *e* are clear of each other. At the end *e* of the leaf *a* a downward projection enters the shell through a suitable slot and holds the leaves down by lateral pressure. Along the flat side of this latch the thread moves, and its final emergence from the shuttle is at this point. This catch is made longitudinal to prevent the abrasion of the thread by the edge of a transverse catch.

The double spring B is, after being struck from the sheet metal, folded upon itself, and an eye formed at the part *g*, as shown in section in Fig. 5. The leaves may be made separately; but I have shown them in a single piece as preferable. The eye being all below the top surface of the spring, enters a chamber, *h*, in the top of the shell, where a hinge-joint is formed by insertion of the pin or rivet *v*. Immediately in the rear of the chamber *h* the shell is depressed for a short distance to a depth equal to the thickness of both leaves *a* and *b*, and this ledge forms a fulcrum, *k*, which gives a support and slight upward spring to both leaves combined. Beyond this ledge, and toward the rear, the leaves are sprung slightly apart, which permits the easy passage of the thread between them in the action of threading; but when locked in position by the catch *e* pressure between them results, which regularly diminishes from the fulcrum to the offset *m*, where it ceases. The projecting lip *d* of the leaf *b* rests in the depression. (Clearly shown in the drawings.)

As the thread in its unwinding is drawn from the different parts of the bobbin, it always emerges at some point on the curved edge or thread-distributer of the leaf *b*, and enters the central guide-opening, *f*. As shown

in Fig. 4, the leaf *b* has about half of its width depressed, so as to allow of the free movement of the thread between the leaves *a* and *b* from the thread-distributer *n* to the center guide-opening *f*.

As the pressure between the leaves *a* and *b* is greatest at the fulcrum *k*, and least at the offset *m*, it is clear that the friction upon the thread will be increased and diminished according to the location of the opening *s s'* or *s''* through which it emerges the second time from the shell, and that different definite tensions may be had and relied upon without trial by stitching. A very important advantage gained by this means of regulating the tension is that all angles are passed before the tension is applied, and consequently the abrasion of the thread due to passing angles under tension is prevented, because all the strain on the thread when it passes these angles is that due solely to the friction of the bobbin in the shell.

By depressing the hinge-joint *g* to or a little below the surface of the shell I avoid all chance of catching the loop thereon as the shuttle passes the needle, and I am enabled to use a shorter needle than is possible with the ordinary shuttle.

It will be understood that neither end of the spring B projects above or outside the cylindrical outline of the shuttle, and that thereby catching of the thread in the backward movement of the shuttle is obviated.

The number of tension-openings *s s'* and *s''* shown is three; but it is evident that any reasonable number can be used to regulate the tension. I have, however, found three to be sufficient. It will also be observed that the slits leading thereto are so slanted as to prevent the escape of the thread from them.

The elliptical opening in the shell admits the bobbin with the least cutting away and weakening of the shell, and also more effectually prevents interference of the needle with the thread, and more effectually protects the thread from the oil of the shuttle-race.

To make sure that the catch *e* cannot catch the thread in the backward movement of the shuttle when the leaf *a* is lifted above the upper surface of the case by the passage of very coarse or lumpy thread, the said catch *e* is obliqued toward the rear in such a manner as to receive the thread upon this oblique edge and conduct it up to the top surface of the leaf *a*. In manufacture the curved edge of the leaf *a* is prolonged and gives to the catch *e* this obliquity when bent at right angles thereto.

Having thus fully described my invention, I claim, and desire to secure by Letters Patent, the following:

1. The combination, in a cylindrical shuttle provided with the chamber *h*, of the double spring B, and the fulcrum *k*, substantially as described.

2. The combination, with the shuttle-case, of the leaf *b*, provided with the thread-distributing curved edge *n*, projection *d*, central guide-opening, *f*, and the tension-openings *s s' s''*, with the leaf *a*, whereby the tension-pressure is applied after the angles are passed, substantially as described.

3. The covering-plate B, composed of the leaves *a* and *b*, the leaf *b* having a portion longitudinally depressed or sunk below the leaf *a* to the cylindrical line of the inner surface of the shuttle-case, and having a curved edge, *n*, in combination with the shuttle-case having an elliptical opening therein.

4. The open-ended cylindrical shuttle-case provided with an elliptical opening in its side adapted to admit of the removal and insertion of the bobbin therethrough, in combination with a double tension-spring arranged to serve as a cover for the said opening, as set forth.

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

FREDERICK P. CHENEY.

Witnesses:

GEO. W. MCGAFFEY,

LYDIA H. MCGAFFEY.