(No Model.)

J. H. WAY.

SHUTTLE FOR SEWING MACHINES.

No. 507,698. Patented Oct. 31, 1893.

Fig. 1.

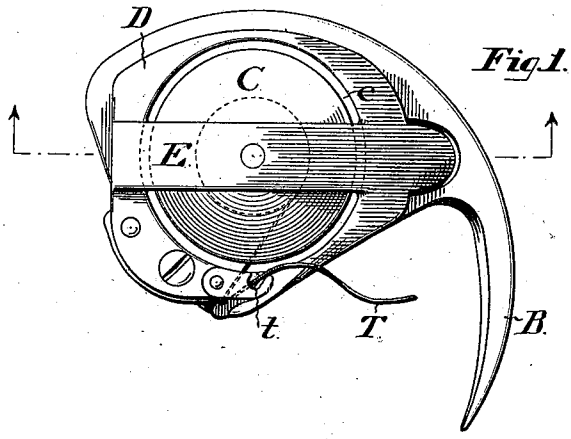


Fig. 2.

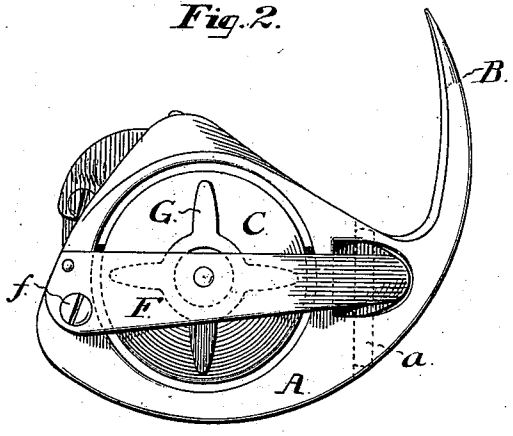


Fig. 5.

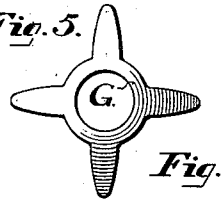


Fig. 6.

Fig. 3.

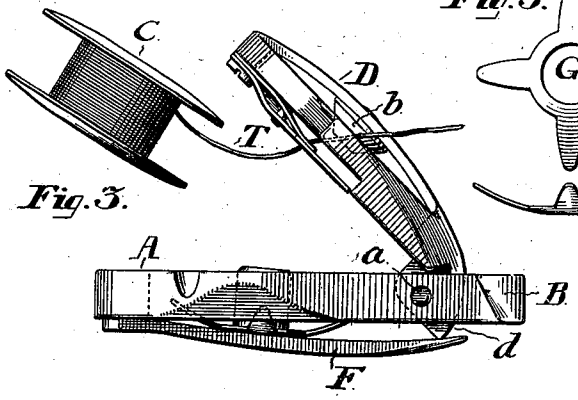
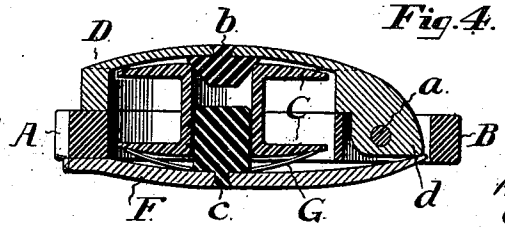


Fig. 4.



WITNESSES:

James H. Bell

E. Reese

INVENTOR

J. H. Way

By Hollingsworth & Riley

Attorneys

UNITED STATES PATENT OFFICE.

JOHN H. WAY, OF PHILADELPHIA, PENNSYLVANIA.

SHUTTLE FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 507,698, dated October 31, 1893.

Application filed April 21, 1890. Serial No. 348,851. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. WAY, of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Oscillating Shuttles for Sewing-Machines, whereof the following is a specification, reference being had to the accompanying drawings, wherein—

Figure 1 represents a side view of a shuttle embodying my invention, as seen looking toward the end or head of the sewing machine. Fig. 2 is a view of the opposite side of the shuttle from that shown in Fig. 1. Fig. 3 is an edge view of the shuttle, when opened so as to remove the bobbin. Fig. 4 is a central section through the shuttle, taken on the axis of the bobbin; and Figs. 5 and 6, are respectively top and side views of the spring washer, by means of which the bobbin is held in place.

In the use of oscillating shuttles, as now commonly constructed, it is found difficult to continue to sew, after a considerable portion of the thread has been unwound from the bobbin. Thus either a very large percentage of the thread upon the bobbin is practically sacrificed, or else such repeated adjustments of the tension are required as to greatly increase the labor of manufacture, and, consequently, enhance the cost of the product. I have found that in some cases it is impossible to utilize more than one-half of the thread upon a bobbin, as after that point the strain required to pull off the thread becomes so excessive as to disorganize the tension of the sewing machine. The primary cause of this difficulty lies in the fact that, in the usual method of construction, the bobbin finds its bearings for rotation, not at its center, but near its circumference, the two sides of the shuttle being formed with overlapping flanges around the seat, or opening of the bobbin, which flanges when closed, press more or less firmly against the edges of the bobbin. The great amount of wear which the bobbins show around their edges gives evidence of the extent of the friction caused in this manner. This friction can be overcome when the bobbin is full and the leverage exerted by the thread in pulling off is relatively great, but as the diameter of the thread coil is reduced, the leverage for the pull is of course rapidly diminished, while the friction at the bearings remains unchanged, until finally a point is reached where the thread pulls off with so much difficulty that the bobbin has to be discarded and a full one substituted. The object of my invention is to overcome this difficulty, and I accomplish it in the following manner:

Referring to the drawings, A represents what may be termed the main body of the shuttle, constituting one side of the bobbin case, the other side, D, forming the remainder of such case, being hinged to the main body by the pivot, *a*.

B represents the horn or beak of the shuttle, which is formed in one piece with the main body thereof, in the ordinary manner.

The diametric spring-piece, F, (which also constitutes the support for one of the bobbin journals,) is secured at one end only, preferably by means of a screw, *f*, across the opening of the bobbin, and a toe, *d*, formed upon the pivoted end of the side, D, bears upon the free end of said spring-piece, F, so as to normally tend to close the two sides of the shuttle together. The action of said spring is indicated in Fig. 3, where the shuttle is represented as open. This feature, however, constitutes no portion of my invention, and is merely described by reason of its reference to other parts.

The bobbin, C, is provided with a central opening, which fits loosely over the pin or stud, *c*, centrally mounted in the spring-piece, F, so as to afford a central bearing at that side of the bobbin. Across the opening in the opposite side, D, of the shuttle is a diametric bar, E, which is rigidly attached to, or formed in one piece with that side of the shuttle, and said piece has at its central part a cone bearing-piece, *b*, which extends into the opening of the bobbin and forms the bearing on that side.

By reference to Figs. 1 and 2 it will be seen that there is a free space, *e*, between the periphery of the bobbin and the opening in the case, there being in this instance no flanges around said opening.

Intermediate between the spring-piece, F, and the proximate face of the bobbin, is an elastic washer, G, preferably of the shape shown in Figs. 5 and 6, where it is represented as having four inwardly curved spring-arms,

adapted to bear upon the face of the bobbin. Said washer slips over the pin, *c*, and tends to press the bobbin away from the side of the case and toward the cone bearing-piece, *b*, but said cone bearing-piece does not permit the proximate face of the bobbin to come in contact with the strip or piece, E. It will thus be seen that the only frictional contact between the bobbin and the inclosing case of the shuttle occurs on the one side at the conical bearing-piece, *b*, and on the other side immediately around the periphery of the stud, *c*, since although the arms of the spring washer, G, extend out toward the periphery, the only bearing surface of the washer upon the case or shuttle proper, occurs around the stud, *c*. The extent of this bearing surface should not be substantially larger than the minimum diameter of the thread coiled upon the bobbin itself, so that there is thus never any leverage against the pull of the thread, but throughout the whole operation a very decided leverage in its favor.

The usual tension device, *t*, having been properly adjusted for the thread, T, the bobbin, C, is inserted in its case, and the two inclosing sides, A and D, are shut together. The thread, T, is then inserted through the openings of the tension, *t*, and the operation of the shuttle takes place in the usual manner. I prefer to use the spring washer, G, in order to prevent the bobbin from over-running, or unwinding too freely, but the tension of said washer may be very light indeed, so as to merely overcome any such tendency and therefore need not be considered as an element in the tension proper.

In the arrangement shown, the openings of the bobbin-case are represented as of the same diameter all the way through, or without flanges around their inner edges, but, inasmuch as the bobbin is held away from both sides of the case, viz: on the one hand by the spring washer, G, and on the other by the wide flare of the conical bearing-piece, *b*, such detail of construction is not absolutely essential. The presence or absence of such flanges has no effect upon the bobbin, where the latter is held clear of contact therewith.

While therefore I have indicated this as the preferred form of my invention, I do not limit myself to the precise embodiment shown.

I claim—

1. The combination with the main body of the case and the stud *c* connected therewith, of the part D attached to said main body and carrying a conical bearing piece *b*, the bobbin C, and the spring G arranged to press the bobbin against the cone, substantially as described.

2. The combination with the main body of the case, the spring F attached to one side thereof, and the stud *c* carried by said spring, of the part D pivoted to said main body and having a toe bearing against the free end of spring F, and carrying a conical bearing piece *b*, the bobbin C loosely fitting on stud *c*, and the spring G also loosely fitting on the stud and having arms pressing the bobbin against the cone *b*, substantially as shown and described.

JOHN H. WAY.

Witnesses:
JAMES H. BELL,
E. REESE.