(No Model.)

J. KEITH.

SEWING MACHINE SHUTTLE.

No. 322,381. Patented July 14, 1885.

Fig. 1.

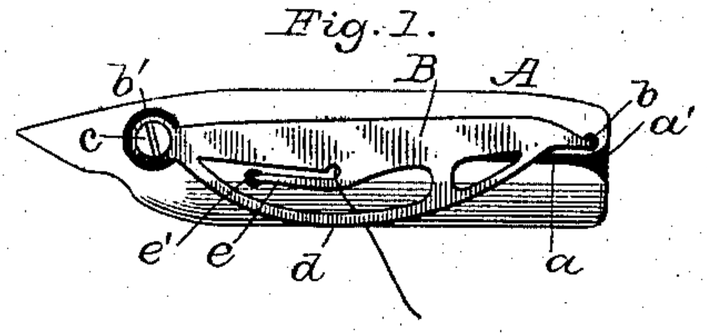


Fig. 2.

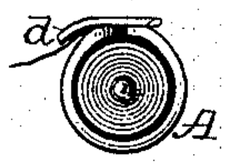


Fig. 3.

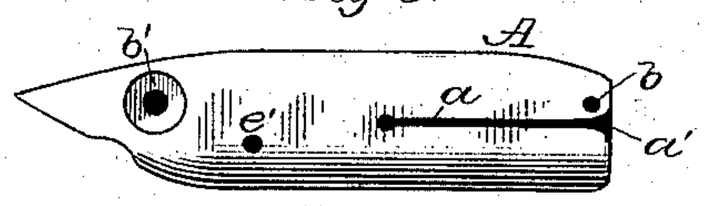
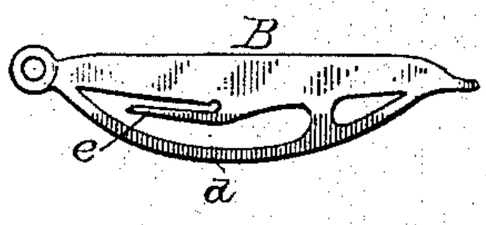


Fig. 4.



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SEWING-MACHINE SHUTTLE.

SPECIFICATION forming part of Letters Patent No. 322,381, dated July 14, 1885.

Application filed February 20, 1884. (No model.)

To all whom it may concern:

Be it known that I, JEREMIAH KEITH, of Northhampton, (Florence,) county of Hampshire, and State of Massachusetts, have invented certain new and useful Improvements in Sewing-Machine Shuttles; and I do hereby declare that the following specification, taken in connection with the drawings furnished, and forming a part thereof, is a clear, true, and complete description of my invention.

The case of my shuttle is cylindrical and open at its heel, its bobbin being confined therein when in use by the shuttle-driver, as heretofore.

The tension-spring employed by me is secured at both of its ends to the top of the shuttle, is rendered adjustable by means of a screw at its front end, and is provided with a curved thread-guard extending from end to end of the spring, and it is also provided between the spring proper and the guard with a forwardly-projecting slender spring-finger having a downwardly-curved tip, which occupies a recess in the case.

The shuttle-case is provided on its upper side with a straight thread-slot, having a wide mouth at the heel of the shuttle and extending to a point at about the middle of the case. During the rearward movement of the shuttle the wide mouth prevents the thread from being caught by the rear edge of the shuttle at either side of the slot, which I find to be frequently liable if the slot have a narrow mouth without the rounded edges.

Although the tension-spring above referred to and the open-end slotted cylindrical case are not in themselves broadly new, and although both have been heretofore employed in shuttles with a view to facilitating the threading thereof, I believe I am the first to so organize these parts that the shuttle can be threaded by merely pulling longitudinally upon the free end of the bobbin-thread, and as a result I have produced at low cost a shuttle of the so called "self-threading" class, capable of receiving and discharging its bobbin without the displacement of any of the parts of the shuttle, one that can be conveniently and rapidly threaded, and one which affords not only the finest gradations of tension, but also a variable tension, according to whether the shuttle is moving forwardly or rearwardly.

To more particularly describe my invention I will refer to the accompanying drawings, in which Figure 1 is a top view of my shuttle complete and threaded. Fig. 2 is a rear-end view of the same with bobbin therein. Fig. 3 is a top view of the shuttle-case. Fig. 4 is a view of the combined tension-spring, spring-finger, and thread-guard detached.

The shuttle-case A is cylindrical, is open at its rear, and is recessed near its point on one side for the proper engagement therewith of the shuttle-driver, all precisely as heretofore. The straight thread-slot *a* has a wide open mouth, *a'*, at the rear end of the shuttle, the edges of the slot being rounded outwardly to form said mouth and thereby to avoid sharp corners with which the thread would be liable to engage during the rearward movement of the shuttle. The front end of the thread-slot is located near the middle of the shuttle and terminates in a rounded eye, as heretofore in shuttles having a laterally-swinging tension-spring.

The location of the inner end of the thread-slot near the middle of the shuttle obviously results in a more even and regular draft of the thread from the bobbin than if it were located nearer one end of the shuttle than the other, it being obvious that if the bobbin occupies the shuttle-case equally on either side of the inner end of said thread-slot the thread will be delivered from both ends of the bobbin with equal freedom, whereas, if the inner end of the thread-slot be located at either side of the center of the bobbin, the thread will be delivered from one end thereof with less freedom than from the other end, and therefore the shuttle-tension will be correspondingly varied.

Near the heel of the case and on its upper side there is a hole, *b*, which serves as a seat for the rear end of the tension-spring B, and on top near the point of the case there is a circular recess, *b'*, for the reception of the front end of said spring and its adjusting-screw *c*.

It is is obvious that the arrangement of the spring with relation to the thread-slot is such that the mouth of said slot is wholly unob-

structed, but its inner end is covered by said spring, so that the thread in passing outwardly from said slot laterally is compressed between the surface of the case and the spring and at a point about midway thereof.

The thread-guard *d* is integral with the tension-spring, and is curved laterally to conform to the exterior shape of the case, and is also curved longitudinally, and extends from end to end of said spring and crosses the thread-slot diagonally.

The use of the specially-formed thread-guard *d* in lieu of the edge of a tension-spring having a corresponding outline not only lessens the weight of the shuttle, but also obviates all unnecessary friction with the thread during the reciprocating movements of the shuttle.

Between the guard and the tension-spring is the spring-finger *e*, which is integral with the spring, projects forwardly, and has its tip curved downwardly, so as to be housed in a recess, *e'*, in the shuttle-case.

Shuttle-tension springs have heretofore been pivoted and had a guard on one side and a thread-finger on the opposite side, and so also have non-pivoted tension-springs had a guard on one side and an intermediate V-shaped thread-finger curved at its tip and housed in a recess in the shuttle-case, but in said prior shuttles last refered to (of which there are two varieties) the thread-slots are diagonal and are not open at the rear end of the shuttle, so that the thread must be passed endwise through said slot in threading, and in one variety thereof the thread passes under the V-shaped finger as in my shuttle.

In prior shuttles having a V-shaped finger on one side of the spring and a guard on the other the thread is necessarily passed beneath the finger, over the spring, and then endwise between the guard and spring, notwithstanding a straight thread-slot is employed.

Shuttles having caps and open-end thread-slots have also been heretofore provided with a tension-spring having no guard, but having a V-shaped finger and tension-pins, but in order to enable the thread to pass beneath the spring two thread-slots were essential—one of which was straight, near the middle of the shuttle, and the other was a diagonal slot leading to the straight slot from the rear end of the shuttle. This finger *e* is long, slender, and elastic, so as to be readily lifted at its tip by the thread, which, when pulled longitudinally toward the point of the shuttle, passes freely beneath said tip, and occupies the straight slot between the finger and the tension-spring.

It will be seen that during the forward movement of the shuttle the tension on the thread is due both to the pressure of the spring thereon and to the abrupt bight of the thread across the edge of the spring near the base of the spring-finger, and that during the backward movement the tension on the thread is lessened, because then only due to the pressure of the spring, as in many prior shuttles of various kinds; but I have, as I believe, for the first time provided for that variation with a tension-spring secured at both ends to the shuttle-case, and having a thread-guard and an intermediate spring-finger, organized with a cylindrical shuttle-shell, closed at its rear end when in use by the shuttle-driver, and having a portion of its body cut away on a curve at its rear end on each side of a thread-slot, so as to constitute what I term an "open-end shuttle," having an open wide-mouthed straight slot extending forwardly from its heel, so that a longitudinal pull on the free end of thread from the bobbin will cause the thread to enter the slot, pass beneath the spring and the guard, and thence beneath and over the spring-finger; and although I make no claim to any of the specific features of construction shown and described,

I do claim as new and desire to secure by Letters Patent—

1. The self-threading open-end cylindrical shuttle having on its upper side a wide-mouthed open-end straight thread-slot extending from the heel to the middle of the shuttle, and an adjustable tension-spring secured at both ends to the shuttle-case, overlying said thread-slot, and provided with a curved thread-guard, *d*, and also with a slender forwardly-projecting spring-finger located between the spring and guard and having its tip housed in a recess in the shuttle-case, substantially as shown and described.

2. The combination, with a cylindrical shuttle-case having a portion of its body at its rear open end cut away on a curve at each side of an open-end thread-slot, of a non-pivoted adjustable tension-spring secured at both ends to the shuttle-case and overlying said thread-slot, and having a spring-finger housed at its tip in a recess in the shuttle-case, substantially as described.

JEREMIAH KEITH.

Witnesses:
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