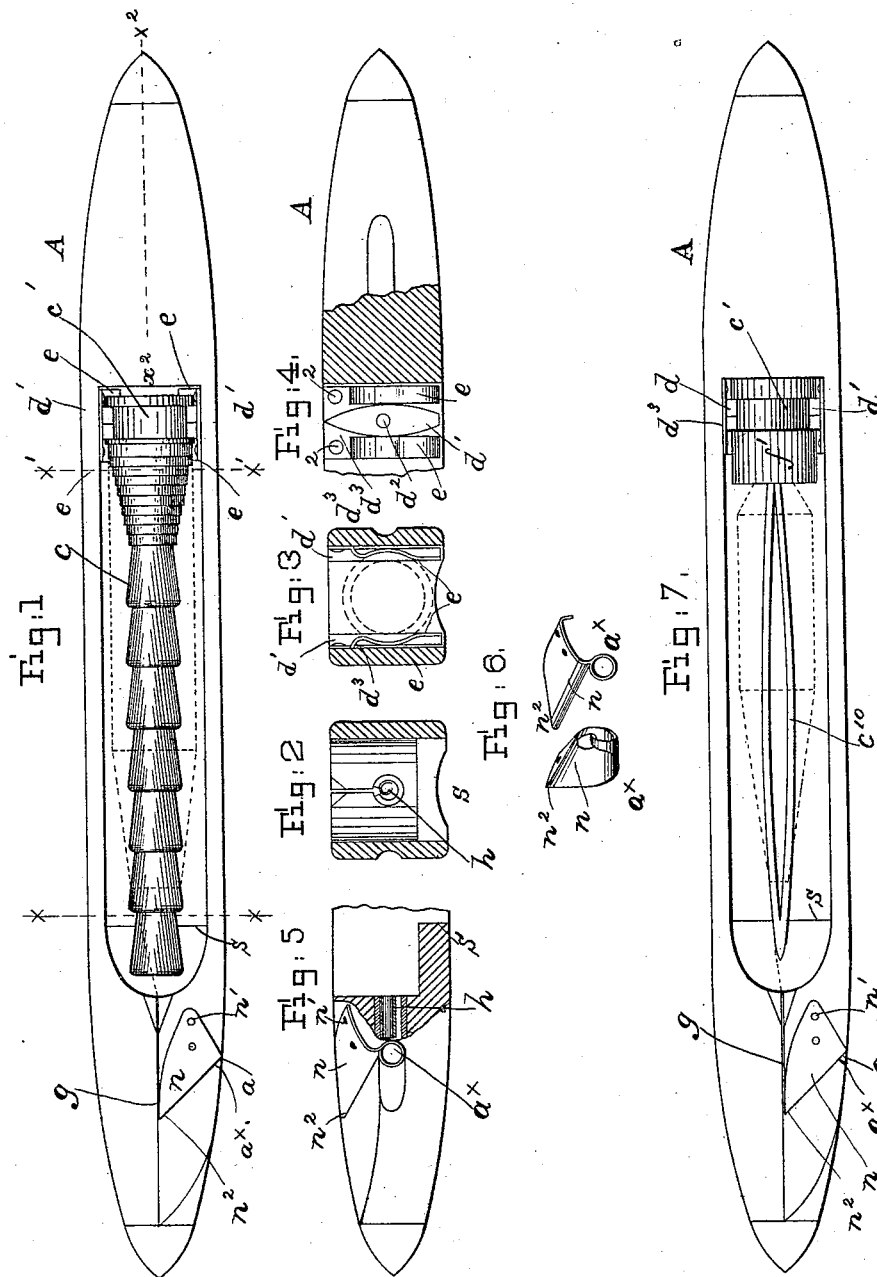


(No Model.)

G. O. DRAPER.
LOOM SHUTTLE.

No. 454,796.

Patented June 23, 1891.



Witnesses:
Fred S. Gruntz of
Marick L. Emery -

Inventor.
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UNITED STATES PATENT OFFICE.

GEORGE O. DRAPER, OF HOPEDALE, MASSACHUSETTS, ASSIGNOR TO GEORGE DRAPER & SONS, OF SAME PLACE.

LOOM-SHUTTLE.

SPECIFICATION forming part of Letters Patent No. 454,796, dated June 23, 1891.

Application filed January 16, 1891. Serial No. 377,978. (No model.)

To all whom it may concern:

Be it known that I, GEORGE O. DRAPER, of Hopedale, county of Worcester, State of Massachusetts, have invented an Improvement in Loom-Shuttles, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

The shuttle to be herein described is more especially adapted for use in a loom of that class wherein a bobbin or cop of yarn on a spindle is to be supplied automatically to the shuttle whenever, for any reason, the weft fails to be properly supplied between the warps, as provided for in United States application, Serial No. 351,228, the said application showing a loom having a transferrer or pusher adapted to push a bobbin or a cop wound on a spindle into the shuttle, and to remove the spent bobbin or spindle from the shuttle. In the loom referred to it has been found that in some instances, when run at high speed, the bobbin or spindle is not knocked squarely out of the shuttle, but catches therein and causes trouble. In my efforts to obviate this trouble I have provided the shuttle with a stop near its front end, against which the point or small end of the bobbin, or it may be the spindle, strikes as the head of the bobbin or spindle, acted upon by an incoming bobbin or spindle, is being pushed out from the shuttle.

In the embodiment of my invention herein shown the head of the bobbin or spindle is provided with an annular recess, which is entered by independent shoes, represented as elliptical in shape, and, as herein shown, certain springs, acting upon the bobbin or spindle head, aid in keeping the bobbin or spindle central with relation to the shuttle, the said shoes being of such shape as to permit the head of the bobbin or spindle to come into the shuttle from the open upper side and to be discharged therefrom at its opposite side. The form of stop referred to, against which the delivery end of the bobbin or spindle contacts, may be greatly varied without departing from my invention.

If desired, the shuttle herein shown may be used in an ordinary loom.

One part of my invention consists in a

shuttle-body having a holder to receive the head of a bobbin or spindle and permit it to be discharged therefrom at the side opposite that at which it is received into the holder, and having a stop located in such position as to be struck by the tip or delivery end of the bobbin or spindle as the head thereof is being ejected from the shuttle, substantially as will be described; also, in a shuttle-body open at its opposite sides, combined with a holder having shoes shaped to be engaged by the head of the bobbin or spindle as it is inserted into the shuttle at one side, and to permit it to be discharged at the other side of the shuttle, substantially as will be described.

Other features of my invention will be hereinafter described, and pointed out in the claims.

Figure 1 is a top or plan view of a loom-shuttle embodying my invention; Fig. 2, a section thereof in the line $x x$, Fig. 1, looking to the left. Fig. 3 is a section in the line $x' x'$, Fig. 1, looking to the right. Fig. 4 is a partial longitudinal section in the line $x'' x''$, the bobbin being omitted; Fig. 5, a sectional detail chiefly to show one form of self-threading shuttle; Fig. 6, different views of the horn-plate having the slotted delivery-eye; and Fig. 7 shows a modified form of shuttle containing a spindle with a cop wound thereon, the cop being represented by dotted lines.

The shuttle-body A, of any usual material and shape, has a thread-delivery eye at a^x , through which the weft-thread a is delivered, as represented in Fig. 1. Preferably the shuttle-body will have some form of slotted eye, into which the shuttle-thread may be automatically led or laid from the bobbin or spindle and into the delivery-eye a^x without inserting the end of the thread through an eye.

As herein represented, the self-threading contrivance for the shuttle consists, essentially, of a metal plate n , attached to the upper side of the shuttle-body by screws n' , the said plate being shaped as best shown in Figs. 5 and 6, wherein it will be seen that it has a point n^2 , and in this instance of my invention the thread-delivery eye a^x forms a part of it. This delivery-eye takes the place of the usual bone or glass delivery-eye commonly used in shuttle-walls, and it is made by curling over

a prong at the other end of the plate n , thus leaving a slotted eye, into which the thread a may be drawn laterally after having been passed under the point n^2 of the plate, the said point intersecting a slot g in the shuttle in prolongation of the bobbin or spindle. The slot referred to contains a slotted guide-eye h , into which the thread will be laid laterally when put under the point n^2 . These guide-eyes a^2 and h form linings for the thread-passages in the shuttle. I have shown one form of what is called "self-threading" or "shuttle-delivery" eye; but instead of the particular form of self-threading eye shown I may use any other well-known form of slotted eye.

Each side wall of the shuttle is provided at its inner side with a like shoe d' , which, as herein shown, is connected by a rivet d^2 to a metal plate d^3 , attached by screws or rivets to the inner wall of the shuttle, and in the form of my invention herein represented the plate d^3 has two springs $e e$ next the opposite sides of the shoes to bear upon a part of the head of the bobbin or spindle at opposite sides of the grooves formed therein, to be described.

The bobbin c , which may be of any usual or suitable construction, has its head provided with an annular groove c' , which as the bobbin is pushed into one open side of the shuttle is made to embrace or pass over or to engage the two shoes referred to. These shoes are and will preferably be elliptical in shape to facilitate the ready passage of the bobbin-head over them. These shoes serve the purpose of aligning the bobbin horizontally in the shuttle and prevent longitudinal movement of the bobbin in the shuttle, the springs e , concaved between their ends, (see Fig. 3,) partially embracing the head of the bobbin at opposite sides of the grooves, and aiding in keeping the bobbin in place when in the shuttle. These concavities form pockets for the reception of the head of the bobbin when the bobbin is in proper central position in the shuttle, and the bobbin will remain in such position until some force from above acts upon it to push it out from the open lower side of the shuttle.

The body of the shuttle, it will be noticed, is open at its upper side for the reception of the bobbin and at its lower side for the ejection of the bobbin, and, as represented, the opening for the reception of the bobbin is longer than the opening for its ejection, so as to leave a stop s lying a little below the delivery end of the bobbin, the said bobbin as it is being pushed out from the shuttle by the pressure of an incoming bobbin against it, as provided for in the said application, striking against the said stop, thereby enabling the head of the bobbin, which is the heavier, to be properly started to correctly enter the discharging-space in the shuttle-box. This stop also acts to prevent the delivery end of the bobbin from sagging or being for any reason

depressed below the bottom of the shuttle during the movement of the shuttle in weaving.

Referring to the modification, Fig. 7, the mass of yarn called the "cop" is represented by dotted lines, and it is wound upon the blade c^{10} of a spindle having an attached head f' , provided with an annular groove c' , like that described in the bobbin shown in Fig. 1, the said grooved head f' co-operating, as before described, with the shoe and the spring. A shuttle open at its opposite sides for the passage of the bobbin or spindle through it is thereby rendered adaptable to the class of loom wherein the bobbins are changed automatically in the shuttle without stopping the loom.

In the operation of a loom of the class referred to it is quite essential that the head of the bobbin or spindle be started first, and that the same pass diagonally from the shuttle; and being the first, so far as I am aware, to provide a stop against which the delivery end of the bobbin or spindle may strike when the bobbin or spindle is being ejected from the shuttle at the side opposite to that at which it entered, it is not intended to limit this invention to the exact shape or position of the stop, and this feature of my invention is of value whatever may be the shape of the contrivance employed for holding the head of the bobbin centrally and against longitudinal movement in the shuttle; and instead of the particular holder herein represented, I might in connection with the stop such as described employ a holder such as represented in United States application Serial No. 351,227, to which reference may be had.

It is not intended to limit this invention to the particular shape of the independent shoes, as their shape may be variously modified without departing from this invention. They may be more or less pointed, more or less wide, and more or less long.

I claim.

1. A shuttle-body having a holder to receive the head of a bobbin or spindle and permit it to be discharged therefrom at the side opposite that at which it is received into the holder, and having a stop located in such position as to be struck by the tip or delivery end of the bobbin or spindle as the head thereof is being ejected from the shuttle, substantially as described.

2. A shuttle-body open at its opposite sides, combined with a holder having shoes shaped to be engaged by the head of the bobbin or spindle as it is inserted into the shuttle at one side and to permit it to be discharged at the other side of the shuttle, substantially as described.

3. A shuttle-body open at its opposite sides, as described, for the entrance and discharge of a bobbin or spindle, combined with independent concaved springs and with shoes to co-operate with the head of the bobbin, substantially as described.

4. A shuttle-body open at its opposite sides and having a self-threading eye, combined with independent shoes mounted upon the inner side walls of the shuttle-body and adapted to engage the head of the bobbin or spindle and maintain it in position within the shuttle-body until ejected therefrom at the opposite side of the shuttle from which it entered, substantially as described.
- 10 5. A shuttle provided at its inner side walls

with shoes and springs to co-operate with and hold the head of a bobbin, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of 15 two subscribing witnesses.

GEORGE O. DRAPER.

Witnesses:

GEO. W. GREGORY,
A. S. WEIGAND.