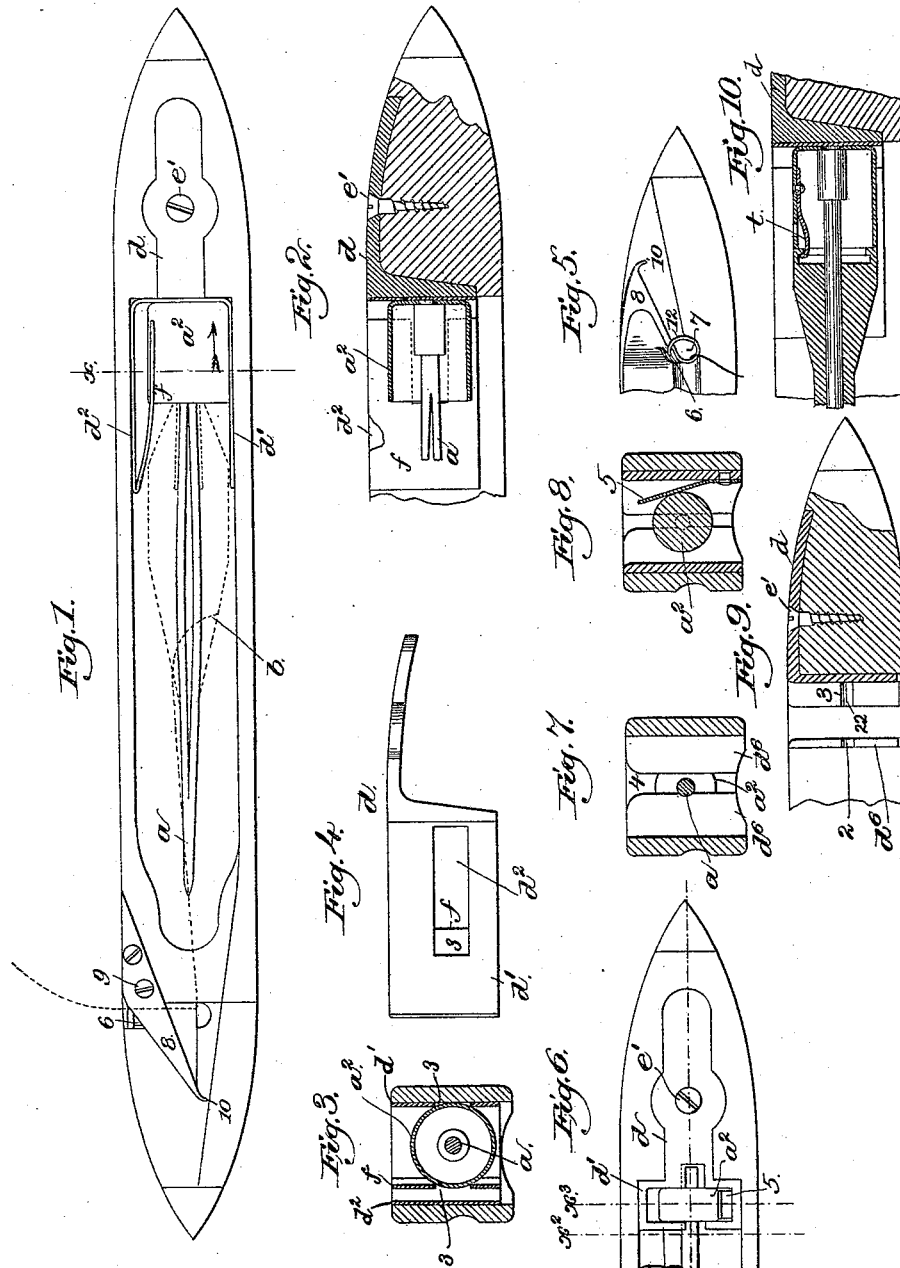


(No Model.)

J. H. NORTHROP.  
LOOM SHUTTLE AND SPINDLE.

No. 454,809.

Patented June 23, 1891.



Witnesses.

Fred. S. Greenleaf  
Frederick L. Emery-

Inventor:  
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by Lemby & Gregory, Attys.

# UNITED STATES PATENT OFFICE.

JAMES H. NORTHROP, OF HOPEDALE, MASSACHUSETTS, ASSIGNOR TO GEORGE DRAPER & SONS, OF SAME PLACE.

## LOOM SHUTTLE AND SPINDLE.

SPECIFICATION forming part of Letters Patent No. 454,809, dated June 23, 1891.

Application filed May 23, 1890. Serial No. 352,960. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES H. NORTHROP, a subject of the Queen of Great Britain, but at present residing at Hopedale, county of Worcester, State of Massachusetts, have invented an Improvement in Loom Shuttles and Spindles, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

The shuttle and spindle herein to be described are more especially useful in a loom containing a shuttle to and from which a spindle containing a cop or bobbin of yarn is to be automatically supplied and removed while the loom is in motion, to thus avoid stopping the loom when the weft-yarn on the particular spindle then in the shuttle is exhausted or fails to be properly delivered; but the shuttle and spindle are new with me and my invention is not limited to the use herebefore recited.

In this my invention the spindle carrying a cop or bobbin of weft-yarn has a head so shaped that it may readily be engaged by a holding device attached to the shuttle-body, the said holding device being so shaped as to permit the head of the spindle to come into engagement with it at the top or one open side of the shuttle and pass out from the said holding device at the bottom or other open side of the shuttle, the same shuttle being adapted to receive one after another of a series of spindles, each carrying a weft-yarn. The shuttle has also been so constructed as to be what I call "self-threading," I meaning thereby that the delivery-eye in the side wall of the shuttle is so slotted as to cause the thread led off the end of the spindle to be automatically drawn into the said delivery-eye while the loom is in motion.

Applications Serial Nos. 351,228 and 380,494 show mechanism by which to automatically push the spindle containing a cop or bobbin into position in a shuttle while in a shuttle-box and while the loom is running at high speed.

Figure 1 is a plan or top side view of a shuttle containing a spindle embodying my invention. Fig. 2 is a partial longitudinal section thereof; Fig. 3, a section in the line  $x$

of Fig. 1; Fig. 4, a side elevation of the holding device detached; Fig. 5, a detail of the shuttle at its self-threading or slotted delivery-eye; Fig. 6 shows a modification of my invention, wherein the holding device is shaped somewhat differently; Figs. 7 and 8, sections of Fig. 6 in the lines  $x^2$  and  $x^3$ ; Fig. 9, a longitudinal section of the modification shown in Fig. 6, and Fig. 10 a modification showing part of a spindle with part of a bobbin thereon.

The spindle  $a$  is shown as split and bulged centrally to aid in holding the cop of yarn  $b$  in place thereon. The spindle is and may be of any usual shape, and the cop may be applied directly to the spindle or to a paper or other usual cop-tube, or to a quill or other suitable bobbin, or in any other way. The inner end of the spindle is provided with a head  $a^2$ , herein represented as substantially cylindrical in shape; but the shape of the head in cross-section is not material so long as it will readily enter the holding device to be described when the head is brought into position opposite the said device.

The holding device  $d$ , attached to the shuttle-body  $e$  by a screw  $e'$ , is shown as having two rather wide arms  $d'$   $d^2$ , one of which is provided with a spring-catch  $f$ , extended back into the space between the said arms, the single arm  $d'$  and the spring-catch  $f$  being shown as provided each with a notch (see Figs. 3 and 4) to receive the head  $a^2$  of the spindle, shown as hollow and substantially cylindrical in cross-section, the said notches holding the head and keeping the spindle in horizontal position.

In practice it is very difficult to always place the shuttle in exactly the same position in the shuttle-box and with relation to the pushing device employed to push the spindle into the holding device in the shuttle; but by shaping the holder as in Figs. 1, 2, and 3 the head of the spindle may be readily inserted into the holding device, notwithstanding slight variations in the position of the shuttle-body, for should the head of the spindle not enter the holding device, so that the head comes within and so as to be caught by the end of the spring-catch  $f$ , the momentum of the spindle after the shuttle has

been arrested by the picker at the end of the first shot of the shuttle will cause the head of the spindle to be moved in the direction of the arrow thereon in Fig. 1 to thus place the inner end of the head of the spindle beyond and so as to be engaged by the said catch, as in Figs. 1 and 2. If it is desired to use a wooden bobbin on the spindle, the head may have a catch *t* to engage a groove in the bobbin, as in Fig. 10.

The shuttle-body is cut away beyond the delivery end of the spindle for the reception of a thread-guide block 6, having a slotted delivery-eye 7, and a part of the shuttle has attached to it by screws 9 a horn 8, having a point 10, under which the shuttle-thread led from the end of the spindle passes into the said open slotted delivery-eye, thus enabling the shuttle to be easily and quickly threaded without drawing the end of the shuttle-thread through a round eye in the side wall of the shuttle.

Referring to Fig. 5 it will be seen that the delivery-eye nearest the outer side of the shuttle has a finger 12, over the point of which the thread passes when following into the delivery-eye.

It will be understood that when a spindle with a cop of yarn thereon is fed automatically into the shuttle used in the loom the end of the thread of the cop on the spindle may be caught upon a suitable pin or catch while the spindle is in a suitable hopper or guide, as in said applications, so that as the spindle is fed into the shuttle the said thread will be automatically led into the usual delivery-eye to be properly paid out or delivered therefrom into the shed.

It is not intended to limit this invention to the exact form of devices whereby the shuttle is left or rendered what is called "self-threading," as instead I may use any suitable self-threading construction.

In the modification, Figs. 6, 7, and 8, the holding device is shown as composed of a plate or shank provided with rigid arms *d'*, having inturned lips *d''*. The arms *d'* and lips *d''* are shaped to leave an open free chamber or space between them from one to the other open side of the shuttle, so that the head *a*<sup>2</sup> of the spindle may enter the holding device at one open side of the shuttle as its upper side, and be retained centrally therein as long as the weft is properly delivered from the spindle, and then be removed from another open side of the shuttle. The lips *d''* by lapping over upon the head of the spindle prevent longitudinal movement thereof. A slot 4 is left between the ends of the lips *d''* for the spindle next the said head, and the edge of one of these lips is notched, as at 2, and, if desired, the holder may also be notched

at 22 to thus engage the spindle both at the rear and at the front side of the head and retain the spindle horizontally in the shuttle between its upper and lower sides.

I have provided the holding device with a spring, as 5, to act against the head (see Fig. 8) and keep the spindle seated in the said notch or notches.

In other applications, Serial Nos. 351,228 and 380,494, I have shown devices by which to automatically supply the spindles to the shuttle as needed while the loom continues to run at speed, and in another application, Serial No. 351,227, I have shown and claimed a shuttle adapted to have a bobbin filled with yarn inserted automatically therein, and hence I do not herein claim anything claimed in the said applications; nor do I claim the combination, with a shuttle, of a weft-case having connected thread-delivery guides, whereby the weft-thread in the said weft-case, when the latter is applied to the shuttle, is ready to be delivered practically from the end of the spindle and off through a side eye to the fell.

I claim—

1. A loom-shuttle and a holding device open from one to the other side of the shuttle-body, combined with a spindle having a head to be engaged by the said holding device, whereby the head of the said spindle passed into the holding device at one side of the shuttle is delivered from the opposite side of the holding device and shuttle, substantially as described.

2. A loom-shuttle and a holding device open from one to the other side of the shuttle-body for the reception and discharge of the spindle, substantially as described, combined with a spindle having a head, and with a spring to act on the said head to aid in keeping the same in proper position, substantially as described.

3. A loom-shuttle having a slotted thread-delivery eye and a holding device open from one to the other side of the shuttle-body for the reception and discharge of the spindle, combined with a removable spindle, substantially as described.

4. A loom-shuttle and a holding device having a notch, as 2, combined with a spindle having a head and adapted to be inserted in the said holding device, the said notch serving to keep the spindle in substantially horizontal position, substantially as described.

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

JAMES H. NORTHROP.

Witnesses:

WILLIAM F. DRAPER,  
HARRY W. BEATTY.