A. MEUNIER.

SELF THREADING SHUTTLE.

APPLICATION FILED APR. 25, 1913.

1,093,713. Patented Apr. 21, 1914.

Fig. 1.

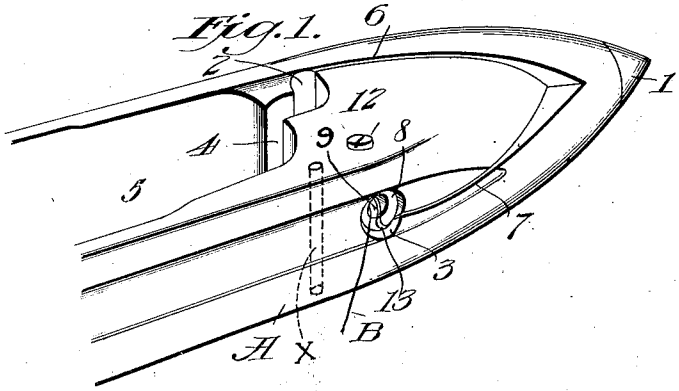



Fig. 2.

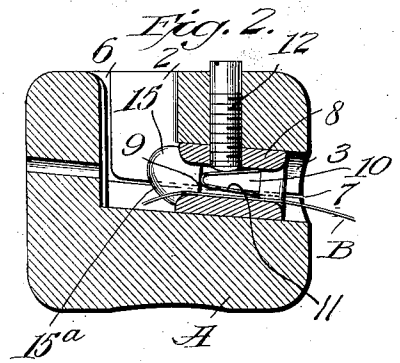



Fig. 3.

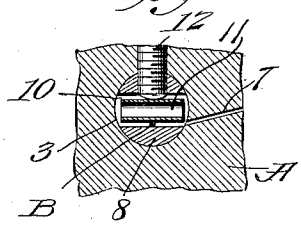



Fig. 4.

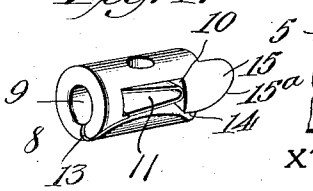



Fig. 5.

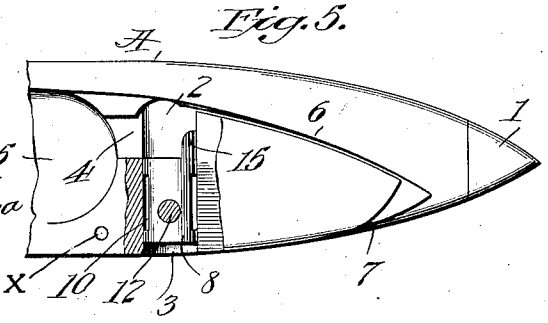



Fig. 6.

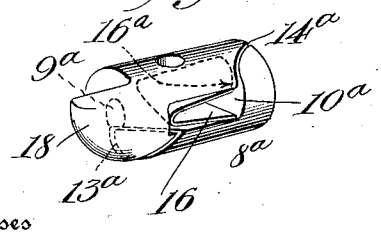
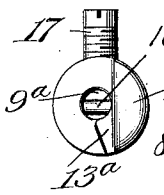



Fig. 7.




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# UNITED STATES PATENT OFFICE.

ALFRED MEUNIER, OF TAUNTON, MASSACHUSETTS.

## SELF-THREADING SHUTTLE.

1,093,713. Specification of Letters Patent. Patented Apr. 21, 1914.

Application filed April 25, 1913. Serial No. 763,671.

*To all whom it may concern:*

Be it known that I, ALFRED MEUNIER, a citizen of the United States, residing at Taunton, in the county of Bristol and State of Massachusetts, have invented certain new and useful Improvements in Self-Threading Shuttles, of which the following is a specification.

The present invention relates to improvements in self-threading shuttles, and has for its object to provide a device of this character which embodies novel features of construction whereby the yarn or thread may be readily brought in proper position within the eye, and also whereby the proper tension may be obtained as the yarn is drawn through the eye.

A further object of the invention is to provide a novel tensioning means which may be readily adjusted so as to obtain the proper tension for all kinds of work, thereby enabling the device to be employed for the weaving of fine or coarse fabric, a uniform weave and a straight selvage being always obtained.

A further object of the invention is to provide a shuttle construction by means of which it is possible to weave a hard drawn filling without the necessity of moistening the same as is usually necessary, and which will eliminate the necessity for stopping the loom owing to the slacking up of the filling so that the stop motion is not operated.

Further objects of the invention are to provide a self-threading construction for shuttles which does not result in an objectionable weakening of the shuttle, which can be readily applied to the shuttles now in use, and which is simple and inexpensive in its construction.

With these and other objects in view which will readily appear as the description progresses, the invention consists in the novel construction, combination, and arrangement of parts hereinafter more fully described, illustrated, and claimed.

A preferred embodiment of the invention is shown in the accompanying drawings, in which—

Figure 1 is a perspective view of one end of a shuttle provided with a self-threading eye constructed in accordance with the invention. Fig. 2 is a transverse sectional view through the side bore of the shuttle and the eye. Fig. 3 is a transverse sectional view through the eye showing the same as mounted within the bore of the shuttle. Fig. 4 is a detached perspective view of the eye. Fig. 5 is a top plan view of the shuttle head, portions being broken away and shown in section to bring out more clearly the manner in which the yarn is directed into the eye from the guide slit of the shuttle head. Fig. 6 is a perspective view of a modified construction of eye. Fig. 7 is an end view of the modified form of eye.

Like reference characters designate corresponding parts in the several figures of the drawings.

Referring to the drawings, the character A designates a shuttle which is substantially the same in general construction as the shuttles now in use, the ends thereof being pointed and provided with the usual metal tips 1. The head of the shuttle is provided with a transverse bore 2 which extends downwardly from the top of the shuttle and communicates at its end with an intersecting and transversely disposed bore 3 which opens through one side of the shuttle. The vertical bore 2 has one side thereof cut away at 4 for the purpose of establishing communication with one end of the usual yarn-receiving recess 5 of the shuttle.

A diagonal slit 6 is formed in the top of the shuttle head and extends from one side of the shuttle head to the side of the vertical bore 2 which is located opposite the inner end of the horizontal bore 3. This top diagonal slit 6 is intersected by a side diagonal slit 7, the said slit 7 communicating with the horizontal bore 3 at one side thereof, and intersecting the same at a point slightly above the bottom thereof.

A substantially cylindrical eye 8 is fitted within the horizontal bore 3, the said eye being formed with a longitudinal thread-receiving opening 9. Extending transversely through the eye 8 and intersecting the thread-receiving opening 9 is a slot 10 within which a tensioning spring 11 is mounted. This tensioning spring 11 is formed of a substantially U-shaped strip of spring material, the curved end of which faces toward the inner end of the eye. The top of the tensioning spring is engaged by the inner end of an adjusting screw 12, while the lower arm of the tensioning spring bears against the yarn B and frictionally holds the same against the bottom of the thread-receiving opening 9. It will thus be obvious that the spring 11 will serve to pro-

duce the necessary tension in the yarn as it is drawn from the shuttle, and by properly adjusting the screw 12, this tension may be either increased or decreased as found necessary.

The side slit 7 of the shuttle head intersects the horizontal bore 3 immediately above the lower face of the transverse slot 10 of the eye, so that the yarn B can pass readily from the side threading slit 7 into the slot 10 under the tensioning spring 11. The adjacent ends of the eye 8 are formed with the axially inclined slits 13 and 14 respectively, the said slits communicating with the slot 10 upon that side thereof which is opposite the side slit 7 of the shuttle head. The inner end of the eye 8 is provided upon the side thereof remote from the yarn receiving recess 5 of the shuttle with an extension 15 which has the lower side thereof curved and rounded at $15^a$. This extension 15 extends downwardly below the intersection of the side diagonal slit 7 of the shuttle head with the horizontal bore 3 so that the yarn as it enters the horizontal bore 3 from the side diagonal slit 7 will engage the curved edge $15^a$ of the extension 15 and be thereby deflected downwardly so as to enter the mouth of the inner slit 14 of the eye 8. The outer slit 13 of the eye 8 extends downwardly below the intersection of the side diagonal slit 7 with the horizontal bore 3, although as the end of the yarn is drawn rearwardly in the act of threading the shuttle, the yarn will be caused to enter the mouth of the slit 13 and pass into the horizontal thread-receiving opening 9 of the eye, being drawn under the tensioning spring 11 from both the inner and outer ends of the eye.

When it is desired to thread the shuttle, the end of the yarn B is drawn forwardly over the top of the shuttle head and caused to enter the top diagonal slit 6. After the yarn has entered this top diagonal slit 6, the end of the yarn B is drawn rearwardly so as to bring the yarn into the side diagonal slit 7. From this side diagonal slit 7, the yarn B is brought directly into the transverse slot 10 of the eye at the middle portion of the eye. The curved edge of the extension 15 at the inner end of the eye acts, as has been before described, to cause the yarn to pass through the inner inclined slit 14 into the opening of the eye, while the drawing of the end of the yarn rearwardly by the operator causes the yarn B to pass through the outer slit 13 of the eye so as to enter the opening 9 thereof. By this simple operation, the shuttle is threaded and the yarn brought under the tensioning spring 11. Owing to the peculiar arrangement of the inclined slits 13 and 14 at the ends of the eye 8, it is impossible for the shuttle to be accidentally unthreaded while in use, and any desired tension may be obtained by properly manipulating the adjusting screw 12. The use of this adjusting screw for regulating the tension will eliminate the present practice of tacking, glueing, or otherwise fastening some material, such as sand paper, hair flannel, or the like, to the shuttle for the purpose of obtaining tension, this not only being very unsatisfactory in its results, but also resulting in the unnecessary destruction of many shuttles and the spoiling of thousands of pieces of fabric.

While the improved shuttle eye has been illustrated in the drawings as applied to the right hand side of the shuttle body, it will, of course, be understood that the same can be applied to the left hand side of the shuttle body as conditions may require, and by way of showing the structural modification that may be resorted to in the construction of the eye itself, a modified form of the eye $8^a$ is illustrated in Figs. 6 and 7 of the drawings. This eye $8^a$ is substantially the same as that previously described, being provided with the thread-receiving opening $9^a$ and also with the transverse slot $10^a$ within which the tensioning spring 16 is mounted. An adjusting screw 17 is provided for regulating the tension in the spring 16, and one of the corners of the said spring 16 is rounded as indicated at $16^a$. The extension 18, corresponding to the beforementioned extension 15, is substantially the same in construction and operates in an identical manner to bring the yarn into the inner slit $13^a$ of the eye. The outer slit $14^a$ of the eye, instead of extending downwardly from the transverse slot $10^a$, as in the previous instance, extends upwardly therefrom. The operation is substantially the same, although owing to the slightly different position of this outer slit $14^a$ of the eye, one of the corners of the tensioning spring 16 is necessarily rounded at $16^a$, as before described, for the purpose of providing a proper clearance for the yarn as it enters the bore $9^a$ from the outer slit $15^a$.

In order to additionally strengthen the head of the shuttle and to protect the same from splitting, it is preferable to drive into the head portion of the shuttle body in rear of, and adjacent to, the bore 3 that receives the eye, a reinforcing dowel X of wood or metal, and other equivalent details may obviously be employed, as well as changes in the form, proportion, and minor details of construction resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent, is:—

1. The combination with a shuttle body, of a hollow tubular shuttle eye having a yarn receiving opening, a bowed tension spring

completely housed within said yarn receiving opening, and exteriorly accessible tension adjusting means for said spring.

2. The combination of a shuttle eye formed with a yarn receiving opening and a transverse slot intersecting the yarn receiving opening, a tension spring doubled upon itself to form leaves and mounted within the yarn receiving opening, and operative means bearing against one of the leaves of said spring for adjusting the tension thereof.

3. The combination of a hollow tubular shuttle eye, a bowed tension spring mounted within the said eye, and means for adjusting the tension of said spring, said means also constituting retaining means for holding the eye in operative position in the shuttle body.

4. A shuttle eye formed with a longitudinal yarn receiving opening and also provided at an intermediate point in its length with a slot which intersects the yarn receiving opening and extends through one side of the eye, longitudinally inclined guide slits being provided which extend from opposite ends of the eye to the slot, and adjustable tensioning means within the yarn receiving opening.

5. A shuttle provided with a bore and a guide slit intersecting the bore, an eye fitted within the bore and formed with a longitudinal yarn receiving opening, said eye being provided with a transverse slot intersecting the yarn receiving opening and opening through one side of the eye so as to communicate with the guide slit of the shuttle head, end slits being provided in the eye which lead from opposite ends thereof to the transverse slot, and an adjustable tension spring mounted within the longitudinal yarn receiving opening of the eye.

6. A shuttle head having a bore therein and provided with a guide slit intersecting the bore, an eye fitted within the bore and provided with a longitudinal yarn receiving opening, said eye being formed with a transverse slot intersecting the yarn receiving opening and extending through one side of the eye so as to communicate with the guide slit of the shuttle head, the inner end of the eye being formed with an extension which projects over the intersection of the guide slit with the bore and has an inclined side, axially inclined end slits being provided in the eye which lead from opposite ends thereof to the slot thereof, the inner end slit being adapted to receive the yarn from the inclined side of the extension, and an adjustable tension spring mounted within the longitudinal yarn receiving opening.

7. A shuttle provided in the head thereof with intersecting bores which open through the top and one side thereof, said shuttle head being also provided with intersecting top and side guide slits, the top guide slit communicating with the top bore while the side guide slit communicates with one side of the side bore, an eye fitted within the side bore and provided with a longitudinal yarn receiving opening, said eye being also formed with a transverse slot intersecting the yarn receiving opening and extending through one side of the eye so as to communicate with the side guide slit, the inner end of the eye being formed with a longitudinal extension which has an inclined side and extends over the intersection of the side guide slit and side bore, axially inclined end slits being provided in the eye which lead from opposite ends thereof to the transverse slot, the inner end slit being adapted to receive the yarn from the inclined side of the extension, and a tension spring of flat cross-section doubled upon itself to form leaves which bear against the interior of the longitudinal yarn receiving opening.

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

ALFRED MEUNIER.

Witnesses:

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ALPHONSE F. MILOT.