Feb. 14, 1933. H. A. DAVIS 1,897,420

SHUTTLE TENSION

Filed Feb. 23, 1932 2 Sheets-Sheet 1

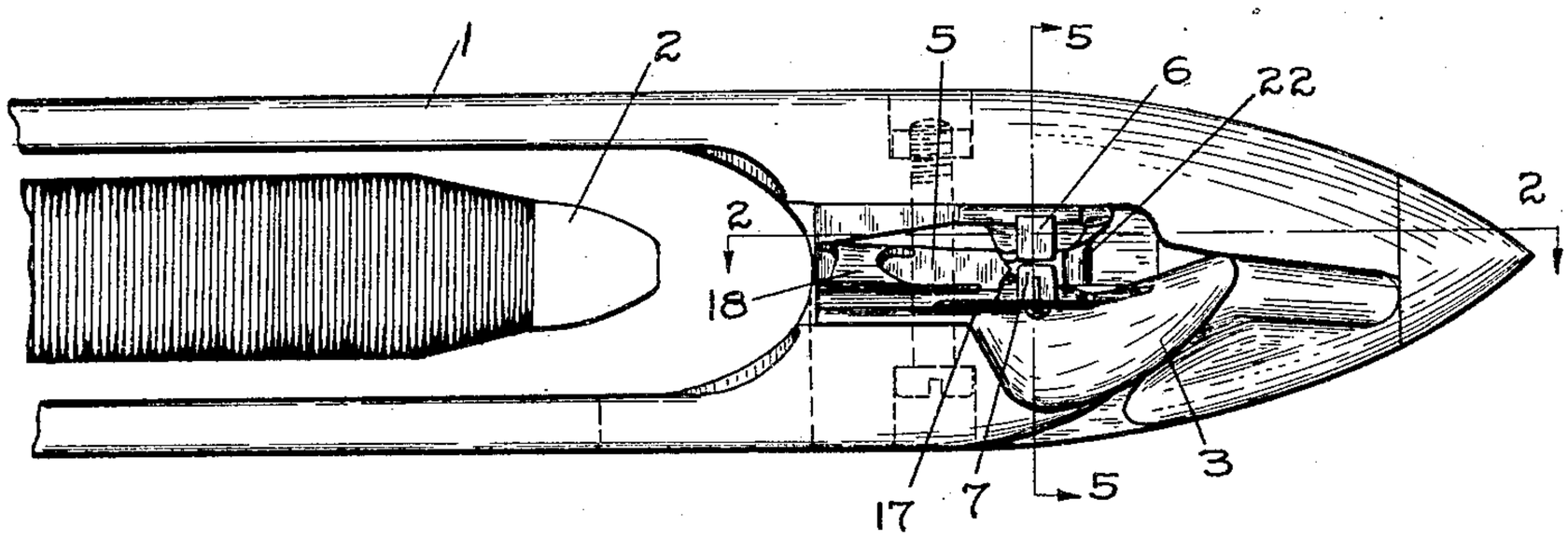

Fig. 1.

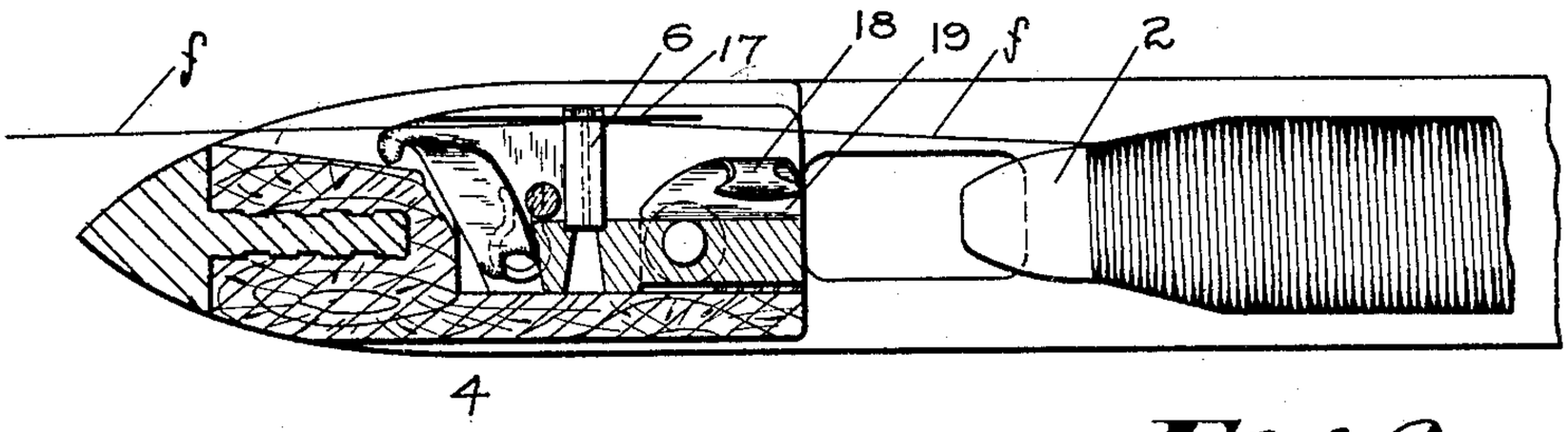

Fig 2.

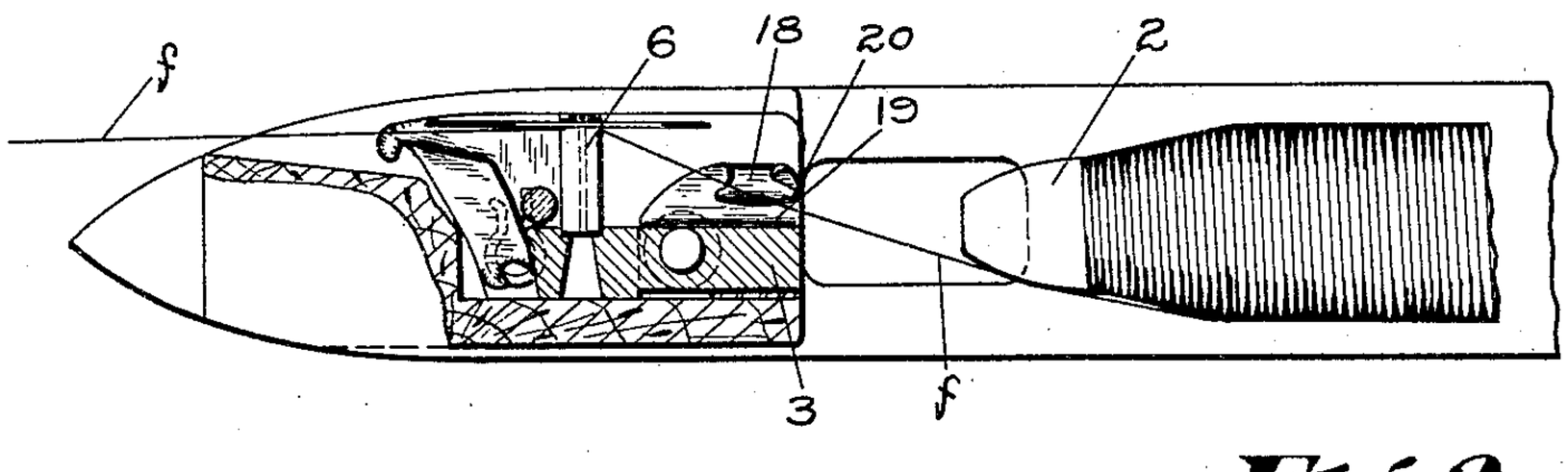

Fig 3.

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SHUTTLE TENSION

Filed Feb. 23, 1932 2 Sheets-Sheet 2

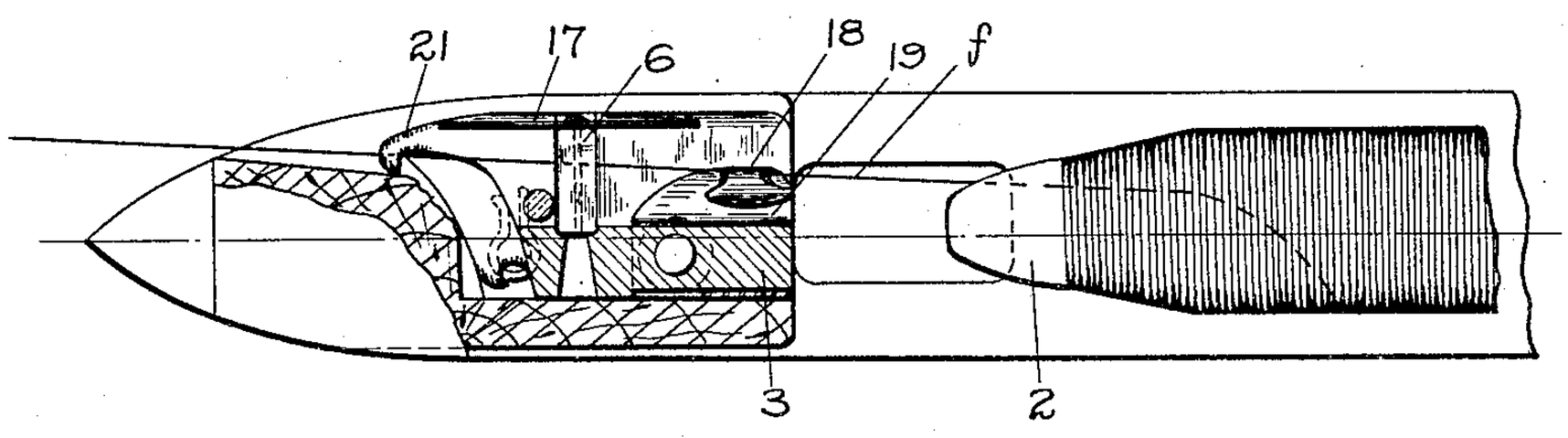

Fig. 4.

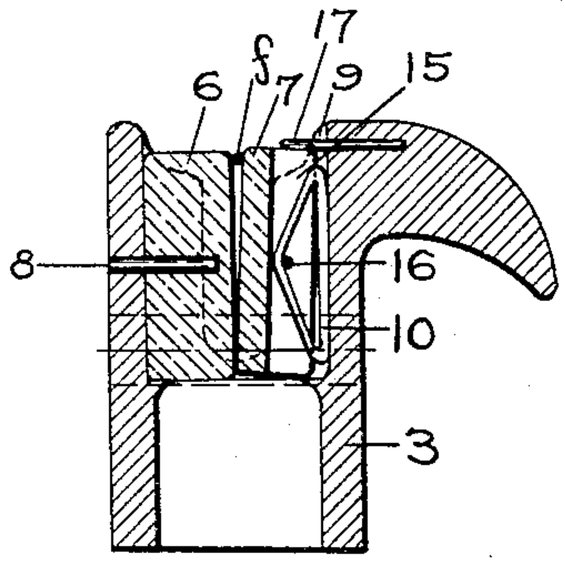

Fig. 5.

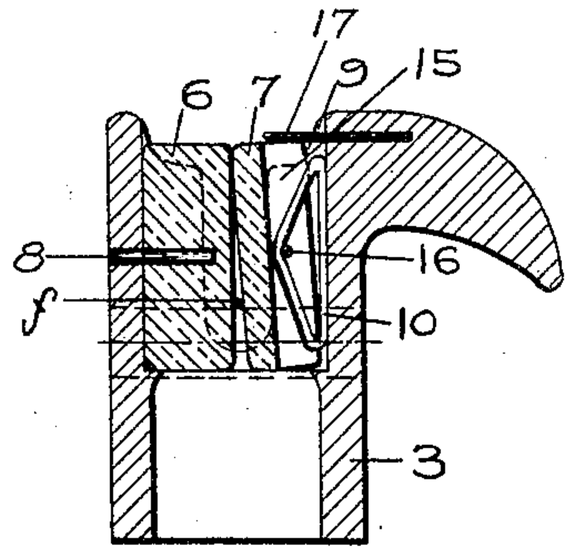

Fig. 6.

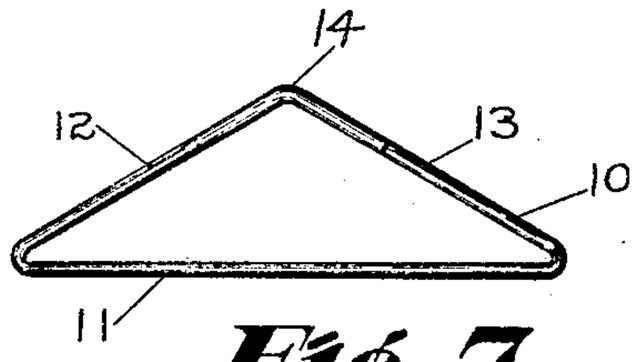

Fig. 7.

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UNITED STATES PATENT OFFICE

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SHUTTLE TENSION

Application filed February 23, 1932. Serial No. 594,549.

This invention relates to loom shuttles, and more particularly to the tension devices therein for controlling the tension on the running filling as it is laid in the shed.

Automatic bobbin changing looms usually include a magazine or hopper for holding a reserve supply of full filling carriers to be inserted in the shuttle when the filling supply in the shuttle is substantially depleted. The shuttle used in such looms is provided with a filling delivery eye which is adapted to partially thread up on the first pick following replenishment of the filling supply, i. e. following insertion of a full filling carrier, and to completely thread up on the second or return pick. When the eye is only partly threaded, on the first pick, the running filling extends from the filling carrier to a holder on the hopper or magazine in substantially a straight line and is, consequently, under much less tension than when the eye is fully threaded and the running filling must pass around a number of posts or corners before finally emerging from the shuttle. The result is that the first pick laid in the shed after each replenishing operation is looser than the rest. While an occasional loose pick is not objectionable in some instances it is, on the other hand, quite seriously objectionable in other instances. It is particularly noted that in the rayons and kindred fabrics the loose picks appear as "shiners", so-called, and result in the cloth being graded as second quality.

It has heretofore been proposed to overcome the above mentioned defect by providing the threading block with a first pick friction, which is intended to place the filling under tension during the first pick following replenishment. However, insofar as I am aware, such first pick frictions have never been entirely satisfactory for the reason that they have not been so constructed as to give any assurance that the filling will come under their influence during the first pick. That is, such devices usually include opposed spring pressed friction members between which the filling is supposed to enter, but since the filling, in unwinding from the filling carrier extends first from the bottom and then from the top of the filling package it oscillates up and down into and out of range of the friction members and frequently fails to enter and stay therebetween. Of course, if the filling does not enter between the friction members they serve no useful purpose and might just as well be omitted.

It is, accordingly, an object of my invention to provide a shuttle having a first pick friction and means for insuring that the filling will come under the influence of the friction device early in the first pick following replenishment.

Friction devices which include opposed spring pressed friction members, whether of the first pick type or not, have heretofore been constructed and mounted in such a way that they tend to cramp and bind, thus failing to fulfill their intended function.

It is, therefore, a further object of my invention to provide a friction device for loom shuttles, which device includes opposed friction members yieldingly urged together in such a manner that they are more reliable in operation, as defined in the appended claims.

Other objects of my invention will, in part, be hereinafter more specifically enumerated and will, in part, become obvious as the description proceeds.

The preferred embodiment of my invention is illustrated in the accompanying drawings in which:

Fig. 1 is a top plan view of a portion of a shuttle embodying my invention;

Fig. 2 is a longitudinal sectional elevation taken on line 2—2, Fig. 1;

Figs. 3 and 4 are views similar to Fig. 2, showing successive stages of the threading of the eye;

Fig. 5 is a cross-section taken on line 5—5 of Fig. 1;

Fig. 6 is a view similar to Fig. 5, showing the filling fully entered between the friction members, and

Fig. 7 is a detail of the spring member.

The shuttle embodying my invention may, as shown on the drawings, include a body portion 1 containing a filling carrier, herein shown as a bobbin 2, a threading block 3 and a side-delivery eye 4. The filling carrier may

be supported at its butt end by suitable spring jaws (not shown) whereby it may be ejected and replaced by a full one when the filling supply becomes substantially depleted.

Associated with the threading block, preferably by being mounted directly in the longitudinally extending slot 5 thereof, is a first pick friction device comprised of a pair of laterally opposed friction members 6, 7. These friction members extend vertically across, or at right angles to, the axis of the filling carrier 2 and are yieldingly urged together to frictionally retard the running filling when it is entered therebetween. To this end, it is only necessary that one of the friction members be yieldingly supported and the member 6 is accordingly fixed in position, being, in the present instance, dowelled to the adjacent wall of the threading block by means of a pin 8. It is to be understood at this point that in the broader aspects of my invention the details of the mounting of the friction members may be varied as desired. On the other hand, while certain improvements in the friction device are particularly valuable as a constituent element of the present shuttle, they are also susceptible of use in other relations.

Referring to the details of the friction device:

As above indicated, at least one of the friction members is yieldingly urged toward the other. In the present instance, member 7 is freely mounted in a guideway 9 constituted by vertical ribs projecting from the wall of the threading block 3. As clearly shown on the drawings, the member 7 is free to move toward and from member 6 or to pivot about an axis parallel to the running filling, being restricted in these movements by its actuating spring 10. The spring 10 is triangular in outline, having a base 11 and two arms 12, 13 which meet at an acute angle to form a fulcrum 14 for friction member 7. This spring will serve its dual purpose, i. e. that of combined spring and fulcrum, regardless of whether the base 11 or the fulcrum 14 is placed against the wall of the threading block, but I prefer the former positioning. The arms 12, 13 enter into a slot 15 in member 7, and have their ends bent to partially engage around a pin 16 driven through the walls of the slot 15. The principal function of the pin is to retain member 7 and the spring together for convenience in assembling the parts in the block, and also to prevent displacement of the spring while the shuttle is in operation. The member 7 may be releasably held again rising out of guideway 9 by a spring wire 17 which may be sprung to the right, Figs. 5 and 6, to permit removal of the member 7 and spring 10.

As is clearly shown in Fig. 5, the member 7, being capable of tilting as well as sliding movements, offers little resistance to the entrance of the running filling *f* between the friction members. However, once the filling has fully entered between the members, as shown in Fig. 6, it comes under the full influence of the spring, and is then under the desired tension.

The other aspect of my invention, above referred to, contemplates the employment of means for deflecting the running filling into the friction device by holding it against the entrance thereto and, to this end, includes a threading scroll 18 positioned between the friction device and the filling carrier.

Fig. 2 shows the running filling extending from the top of the filling package, over the threading device, and off to the left, where it is attached to the loom. This is the position assumed immediately after replenishment when the shuttle is just being picked (to the right in this view).

As the first convolution of filling unwinds, the filling assumes the position shown in Fig. 3, wherein it extends from the bottom of the filling package, past the entrance 19 to the threading scroll and over the friction device. It will be apparent, from a comparison of Figs. 2 and 3, that were the threading scroll to be omitted, or arranged so that it could not thread up at this time, the filling would oscillate, or whip, up and down and would probably not enter and stay between the friction members. However, since the entrance to the threading scroll is positioned above the line of the running filling in Fig. 3, continuation of the unwinding of the first convolution of filling will result in the threading up of the scroll.

After the scroll 18 is fully threaded up, and the filling again extends from the top of the filling package, the top 20 of the scroll will form a bend in the filling. That is, the filling will extend from the top of the package, down through the scroll and then up over the friction device. This will, in effect, serve to pull the running filling down into the friction device, as shown in Fig. 4.

When the shuttle is completely threaded, i. e. on the return pick, the filling will extend beneath guard 21, around post 22 and out the side delivery eye 4, the scroll 18 serving to hold the filling between the friction members.

The particular embodiment of my invention herein disclosed is, of course, merely illustrative of one form and may be varied in many respects without departing from the spirit of the invention as defined in the appended claims.

I claim:

1. A shuttle for automatic bobbin changing looms, said shuttle including a body containing a filling carrier, and a threading block with which is associated a first pick friction device and a threading scroll, said

friction device being comprised of a pair of laterally opposed friction members yieldingly urged together, said threading scroll being positioned between the friction device and the filling carrier and having its entrance positioned above the line the running filling assumes when it extends from the bottom of the filling carrier on the first pick following replenishment, said scroll also having its top positioned below a line extending from the top of the filling carrier to the entrance to the friction device, whereby the scroll will thread up when the first convolution of filling unwinds from the filling carrier and will thereafter deflect the running filling to a position between said friction members.

2. A shuttle for automatic bobbin changing looms, said shuttle including a body containing a filling carrier, and a threading block with which is associated a first pick friction device and a threading scroll, said friction device being composed of a pair of laterally opposed friction members extending vertically across the axis of the filling carrier and yieldingly urged together, said threading scroll having its entrance positioned above the line the running filling assumes when it extends from the bottom of the filling carrier on the first pick following replenishment whereby the scroll will thread up when the first convolution of filling unwinds from the filling carrier, said scroll also having its top portion positioned below a line extending from the top of the filling carrier to the top of the friction members.

3. A shuttle for automatic bobbin changing looms, said shuttle including a body containing a filling carrier, and a threading block with which is associated a first pick friction device and a threading scroll, said friction device being comprised of a pair of laterally opposed friction members at least one of which is yieldingly urged toward the other by a combined spring and fulcrum member, said threading scroll being positioned between the friction device and the filling carrier and having its entrance positioned above the line the running filling assumes when it extends from the bottom of the filling carrier on the first pick following replenishment, said scroll also having its top positioned below a line extending from the top of the filling carrier to the entrance to the friction members, whereby the scroll will thread up when the first convolution of filling unwinds from the filling carrier and will thereafter deflect the running filling toward its normal running position between said friction members.

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