To all whom it may concern:

Be it known that I, HIRAM. A. FELTON, a citizen of the United States, residing at Orange, in the county of Franklin and State of Massachusetts, have invented a new and useful Tension for Shuttles, of which the following is a specification.

This invention relates to a tension device for use on shuttles and the principal objects thereof are to provide a device of extreme simplicity for this purpose and one which shall be capable of use with most kinds of shuttles and all kinds of yarn, including silk, wool and cotton; to provide an adjustment therefore which will be practically positive; to provide a locking device by means of which the tension mechanism can be kept out of operative condition in an extremely simple way so that the shuttle can be used without the tension whenever desired; and to provide a simple arrangement whereby the yarn will be guided from the bobbin so that it will not bind on the end of the bobbin at any time during the operation of the shuttle, whereby the tension device can be simplified and need not be located at the center line of the shuttle.

Further objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings, in which—

Figure 1 is a plan of a shuttle with a preferred embodiment of this invention applied thereto; Fig. 2 is a similar view on enlarged scale of the tension device alone showing it locked in inoperative position; Fig. 3 is a sectional view on the line 3—3 of Fig. 1 showing the parts in operative position.

In the weaving of many kinds of fine worsted, silk, and cotton goods especially, and also even coarse goods, imperfections occur constantly on account of the fact that a satisfactorily simple tension device has not yet been produced, although a large number of attempts have been made to provide one.

In some kinds of cloth a large number of these imperfections occur, thus necessitating careful inspection and the removal of the imperfections by hand means. This adds very materially to the expense of the cloth and in kinds of cloth in which it is not economical to provide such inspection, the result is an imperfect fabric. This invention is designed to do away with a very large percentage of these imperfections and in fact, almost eliminate them entirely, and yet not materially increase the expense of the shuttle, and to provide a tension device which can be made in a small number of sizes and yet be suitable for all sizes of shuttles and also to secure the other results above mentioned.

Referring to the first three figures, a shuttle of well known type is shown provided with a tension device involving two main parts, a soft cushion 10 and a soft-headed plunger 11. This cushion is formed by the provision of a stationary tube 12 of metal or any other desired material, fixed in the side wall of the shuttle and by drawing through the same a bunch of threads, preferably woolen, large enough so that the same will fit tightly within it and be held there by its own friction. The threads on the outer side are shaved off close to the side wall of the shuttle, but those on the inner side are trimmed up to form a tuft which constitutes the cushion. These projecting free ends thus form a soft surface on which the end of the plunger bears. This plunger can also be provided with a tip formed in the same way, but I prefer to use a tip 14 of felt forced into the end of the plunger and held in place preferably by its own friction, although it can be glued in if desired. For the purpose of supporting and guiding this plunger, a second tube 16 is provided in the other side wall of the shuttle. The plunger is adapted to move back and forth in this tube 16 which constitutes an accurate guide therefor.

Although I have described the two tubes as separate, and although they can be so made, I have shown them in the drawing as formed from a single piece of tubing and consequently integrally connected by a bottom bridge 17. In this way the two tubes are kept absolutely in alignment and each one assists in holding the other in position.

The tube 16 is provided with an internal screw-thread extending in from its outer end. Adapted to screw into this thread is an adjustable head 18. This is provided with a slot or other means by which it can be turned from the outside by a screw driver or wrench, for the purpose of securing the desired adjustment. On the inner end this head is provided with a projection 19 and
centered on this projection is a compression spring 20 which is adapted to enter a socket in the inner end of the plunger and be centered thereby at that end. The plunger is provided with a shoulder 22, at a distance inside its own end for receiving the end of this spring. It is against this shoulder that the spring exerts its pressure and normally forces the plunger toward the opposite side of the shuttle so as to cause the tip of the plunger to apply pressure to the soft cushion and tension the yarn.

It will be obvious that the spring is centered by the projection 19 at one end and the socket at the other so that it cannot come into conflict with the interior screw-threads on the tube and that the degree of compression of the spring and its pressure on the plunger can be regulated by turning the head out or in as conditions may require.

This is an extremely simple method of regulating the tension and one that is not likely to go out of order, owing to the severe usage to which the shuttle is put in practice.

It is possible that with some kinds of cloth the tension will not be required and consequently, I have provided means whereby the tension device can be locked in inoperative condition in an extremely simple way. This consists in the provision of a notch 23 at the side of a longitudinal slot extending in from the inner end of the tube 16 and the provision on the plunger of a projecting pin 24 which can be pushed back along the slot and turned into the notch. In this way the plunger is held back and the shuttle can be used without employing the tension. Furthermore, the plunger can be held back temporarily while the shuttle is being threaded, if desired. For the latter purpose it is not absolutely necessary to have a pin projecting from the plunger, but a mere hole in the plunger is sufficient which can be engaged by a nail or wire and pushed back, and then held in retracted position in the same way by leaving the wire in position during threading.

For the purpose of simplifying the device considerably and permitting of the location of the cushion 10 substantially in contact with one side wall of the shuttle, I have provided a guide 25 located at the center of the shuttle for receiving the yarn from the bobbin and then delivering it to the tension device. The object of this guide is not mainly to guide the yarn to the tension device, although it does prevent the yarn from rising or falling too far along the surface of the cushion and plunger tip, but it is for the purpose of always drawing the yarn from a point in axial alignment with the bobbin so that the yarn will not at any time bind on the end of the bobbin.

Although I have illustrated and described only two forms of the invention, I am aware of the fact that many modifications can be made therein by any person skilled in the art without departing from the scope of the invention as expressed in the claims. Therefore, I do not wish to be limited to all the details of construction herein shown and described, but

What I do claim is:

1. A tension device for a loom shuttle, comprising a tubular member located in one wall of the shuttle, a cushion held by said tubular member and extending into the interior of the shuttle, a tubular member opposite the first named tubular member, a plunger in the second tubular member, a spring for forcing said plunger toward the cushion, and means whereby said tubular members are kept in alignment with each other.

2. A tension device for a loom shuttle, comprising a tubular member located in one wall of the shuttle, a cushion held by said tubular member and extending into the interior of the shuttle, a tubular member opposite the first named tubular member, a spring plunger in the second tubular member, said tubular members having an integral connection between them across the shuttle.

3. A tension for a loom, comprising a tube fixed in one wall of the shuttle and projecting inwardly therefrom, a plunger located in said tube and having a soft end, said plunger also having a socket in its inner end provided with a shoulder at the bottom thereof, a spring in the tube extending into said socket and engaging said shoulder whereby the spring is held centrally in the tube, and means at the outer end of the tube for engaging said spring, whereby said spring will hold the plunger with spring pressure.

4. A tension for a loom shuttle, comprising a tube fixed in one wall of the shuttle and projecting inwardly therefrom, a plunger located in said tube and having a soft end, said plunger also having a socket in its inner end provided with a shoulder at the bottom thereof, a spring in the tube extending into said socket and engaging said shoulder, whereby the spring is held centrally in the tube, the outer end of said tube being provided with an internal screw-thread, a nut engaging said screw-thread and adjustable along the tube by a turning motion, said nut being provided with a screw slot in its outer end and with a central projection on its inner end for centering the outer end of said spring.

5. A tension device for a loom shuttle, comprising a tube fixed in one wall of the shuttle and extending into the interior thereof, said tube having a slot extending in from the inner end and a notch at the side of said slot, and a spring-pressed plunger located
in said tube and having means whereby it can be locked in said notch in retracted position.

6. A tension device for a loom shuttle, comprising a cushion, a plunger adapted to engage said cushion and hold the yarn thereon, said cushion being located at one side of the interior space of the shuttle, and means whereby said plunger can be locked out of contact with the cushion.

7. A tension device for a loom shuttle, comprising a tube fixed in one wall of the shuttle and projecting into the interior there- of, a cushion carried by the opposite wall of the shuttle in line with the tube, a spring-pressed plunger located in said tube and having a cushion on the inner end, and means for locking the plunger in the tube in retracted inoperative position.

In testimony whereof I have hereunto set my hand, in the presence of two subscribing witnesses.

HIRAM A. FELTON.

Witnesses:

ALBERT E. FAY,
C. FORREST WESSON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D.C."