(No Model.)

M. & F. CAMAGNI.

TENSION DEVICE FOR LOOM SHUTTLES.

No. 537,015. Patented Apr. 9, 1895.

Fig 1

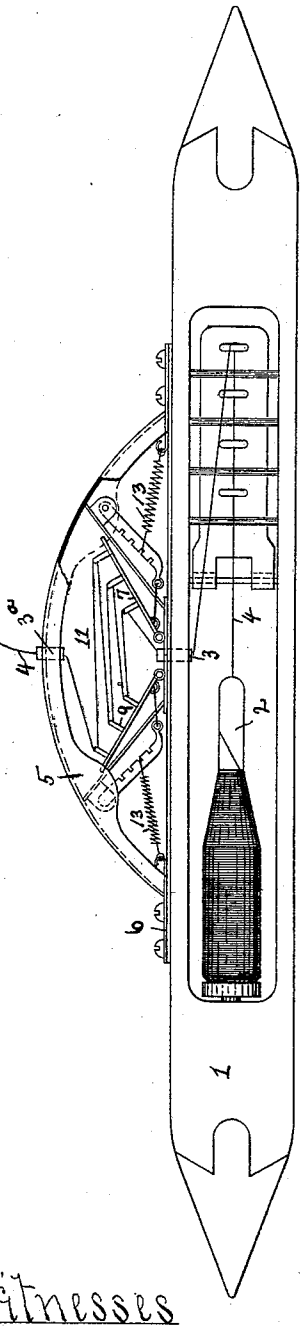


Fig 2

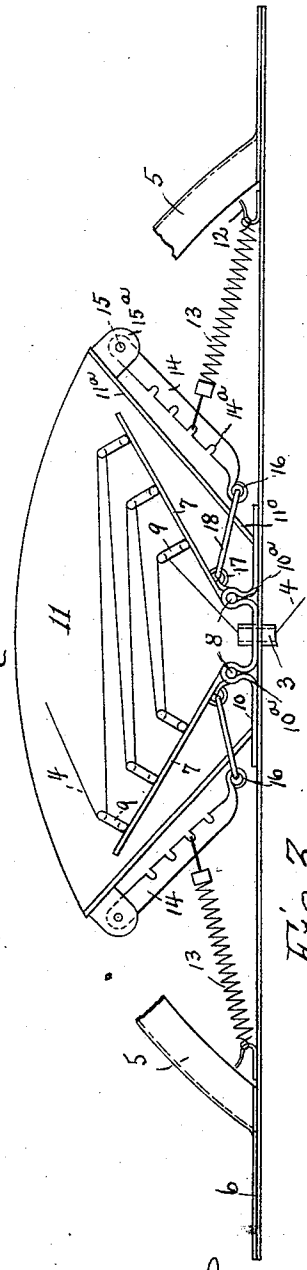
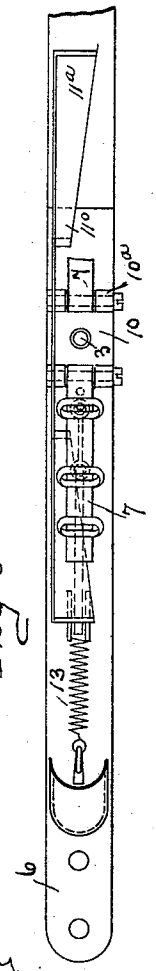


Fig 3



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UNITED STATES PATENT OFFICE.

MARIO CAMAGNI AND FELIX CAMAGNI, OF PATERSON, NEW JERSEY.

TENSION DEVICE FOR LOOM-SHUTTLES.

SPECIFICATION forming part of Letters Patent No. 537,015, dated April 9, 1895.

Application filed July 23, 1894. Serial No. 518,302. (No model.)

To all whom it may concern:

Be it known that we, MARIO CAMAGNI and FELIX CAMAGNI, of Paterson, in the county of Passaic and State of New Jersey, have invented a new and Improved Tension Device for Loom-Shuttles, of which the following is a full, clear, and exact description.

Our invention relates to tension devices for loom shuttles and more particularly to such devices as are used in connection with shuttles employed in weaving silk.

It is necessary in weaving silk to provide tension devices by which the tension of the threads may be regulated, and it often occurs in the weaving of light goods, that the selvages are turned up owing to the tension device not having a uniform and regular tension, and in many instances the threads are not held taut enough, causing defective work. The object of our invention is to overcome said objections and to provide a device by which the tension may be regulated, and which, when regulated at a certain degree of tension, that degree will be maintained with regularity and uniformity when the device is in operation until it is desired to change the same. As these devices are employed principally on what are known as the French and English looms our improvement relates especially to such looms, as in all other tension devices we employ a spring in conjunction with the ordinary tension fliers and guide arms provided with loops for the thread; but we accomplish the objects or results above outlined by the sub-division or distribution of the tension—as will be hereinafter explained—so that the tension is not caused solely by a direct strain on the spring while the thread is being taken from the bobbin in the shuttle. We have found by prior construction where a spring is employed with the flier arms connected directly thereto, that there is much greater strain on the fiber when the said flier arms have approached each other than when they are farthest removed, or at any other time during their movements, so that the thread is very liable to be broken or so tightened as to produce unsatisfactory results. We therefore interpose a lever between the spring and the flier arm which we have found from practice to accomplish an object greatly to be desired, namely, securing a gentle and uniform tension which prevents the silk thread from getting slack and from breaking, the tension acquired being sufficient to keep the thread taut without being so great as to cause it to break. The tension of the spring is subdivided or equally distributed by the interposition of such lever. The leverage obtained reduces the strain on the fiber and has been found to be of great practical utility.

Our improvement consists in peculiar combinations of parts and the features of construction which will be hereinafter described and particularly pointed out in the appended claims.

In the drawings, in which similar numerals of reference indicate like parts, Figure 1, is a top plan view of the shuttle provided with our improved tension device, with a portion of the guard broken off. Fig. 2, is an enlarged detailed plan view of the tension regulating device; and Fig. 3, is a part plan of Fig. 2, showing the tension frame with its side edges upturned to form a flange decreasing in width from top to bottom, and the adjustment of the swinging fliers partly in section.

The shuttle body, 1, is of the usual kind, having the customary recess in which the bobbin is held, and the usual eyelet, 3, is arranged, through which the thread, 4, passes. It is also provided on one side with a guard, 5, secured to a base plate, 6, which is fastened to the shuttle in the usual way. Within the guard are the oppositely arranged tension fliers, 7, which are of the customary kind and are hinged as shown at 8, being adapted to swing toward and away from each other. These fliers have the customary loops, 9, to receive the thread, 4. The thread also passes in the usual way through the eyelet, 3^a, in the outer portion of the guard. The fliers, 7, are hinged to the base plate, 10, of the back plate, 11. This base plate, 10, is secured to the base plate, 6, which is in turn secured to the shuttle. The back plate, 11, is secured at its upper end, which is larger than its lower end, in the central upper portion of the semicircle and guard, 5, in any appropriate manner. The said back plate, 11, is provided at each side with an upturned edge or flange, which is wider at the top, 11^a, than at the bottom, 11^c, being cut off toward the bottom, and the upper portion of each flange serves as a sup-

port for the upper ends of the fliers, 7, which rest against them when no thread is being taken from the bobbin. The base plate, 10, is so bent as to form eyes, 10^a, adapted to receive a pin or pivot, 8, the central part of said eyes being cut away so as to receive the eye end of the swinging fliers, 7. The pin or pivot, 8, passes through the eyes, 10^a, and the eye on the end of the swinging flier. The back plate, 11, is provided with apertures at the bottom where it joins the base plate, 10, through which apertures the rear portion of the eyes, 10^a, pass. The back plate, 11, the bottom plate, 10, and the base plate, 6, are soldered together or connected in any other suitable manner.

Hooks or loops, 12, are secured to the plate, 6, and the springs 13, are secured to said hooks or loops, 12. The swinging arms, 14, provided with notches 14^a, are pivotally secured within the guard, 5, by the pins, 15, into lugs, 15^a, and are provided at their lower ends with eyes, 16.

Eyelets, 17, are secured to the lower back portion of the fliers, 7, and said eyes are connected by a strand of any suitable material, 18, with the eyes, 16, on the ends of the swinging arms, 14.

The operation of our improved tension device is as follows: The thread passing through the eye, 3, and through the alternating loops, 9, on the swinging fliers, 7, and through the eye, 3^a, draws the swinging fliers, 7, together into a perpendicular position under the eye, 3^a. In this operation the swinging fliers secured in the eyes, 10^a, formed by the bending of the base plate, 10, turn in said eyes and said fliers being connected with the swinging arms, 14, by means of the strands, 18, and the springs, 13, being connected with the swinging arms, 14, a tension is secured which is uniform or nearly so while the fliers are passing from the resting position shown in Fig. 1, until said fliers arrive at a perpendicular position under the eyelet, 3^a, and while said fliers are returning from said perpendicular position to said resting position. When it is desired to increase or decrease the tension of the springs, 13, and consequently of the fliers, upon the thread said springs are raised or lowered as many notches on said swinging arms, 14, as is necessary to give the required tension.

In tension devices as heretofore devised, as the flier arms approach each other the tension of their springs increases by reason of said arms being connected directly to the springs; so that there is much greater strain on the fiber when the flier arms have approached each other than at any other time during their movements. Hence the thread is liable to be broken or so tightened that the selvage edges are turned over. By our improvement the tension is practically or substantially uniform at all times and the silk will lie straight and be neither too tight nor too loose, thus accomplishing good work, saving much waste time in repairing and making less work for the pickers.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The combination with the shuttle body and the swinging tension fliers provided with thread loops, of the springs and interposed swinging arms pivotally mounted at one end and at the other end each connected with a flier arm, the said springs being connected at one end to a swinging arm between the ends of the latter and at the other end to a fixed part of the shuttle body, substantially as described.

2. The combination with the shuttle body and the guard, of swinging tension fliers having loops, swinging arms pivotally mounted at one end on the said guard and each connected near its other end with a flier near the pivot of the latter, and springs having one end connected with the guard and their other ends adjustably connected with a swinging arm between the ends thereof, substantially as shown and described.

3. The combination with the shuttle body and the guard, of pivotally mounted fliers having loops, notched swinging arms pivotally mounted at one end on the guard and a link connecting each arm near its other end with a flier near the pivot of the latter, and springs secured at one end to some fixed part and each having its other end adjustably engaged with the notches of a swinging arm, substantially as and for the purpose specified.

4. The combination with the back plate provided at each side with an upturned flange tapering from the top toward the bottom, of the swinging flier arms, the notched swinging arms pivotally mounted on said back plate, and the link connecting the lower end of each of said swinging arms with a flier arm and the springs connected at one end to a swinging arm, and at the other end to a fixed part of the shuttle body, all substantially as herein shown and described.

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