

March 20, 1951

R. G. TURNER

2,545,934

BALANCED WEFT TENSION FOR LOOM SHUTTLES

Filed Nov. 6, 1948

FIG. 1

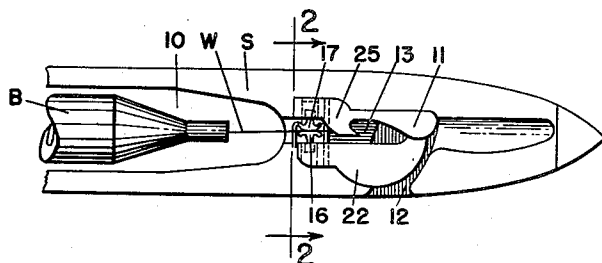


FIG. 2

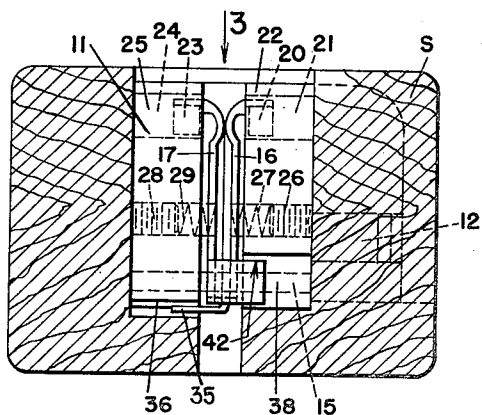


FIG. 3

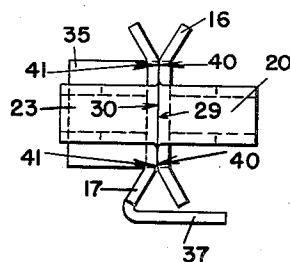
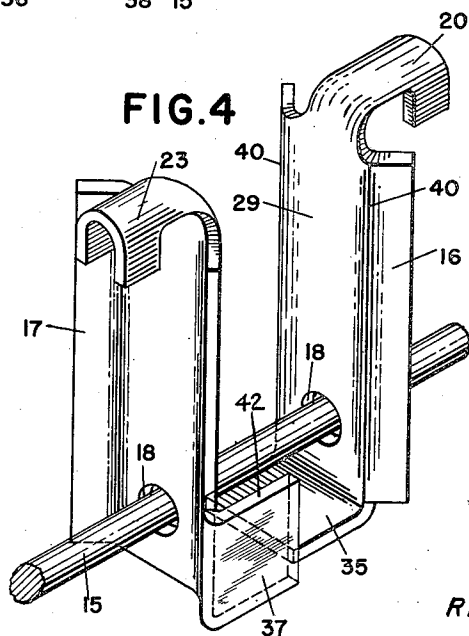


FIG. 4



INVENTOR
RICHARD G. TURNER

Chas. P. Hawley
ATTORNEY

UNITED STATES PATENT OFFICE

2,545,934

BALANCED WEFT TENSION FOR LOOM SHUTTLES

Richard G. Turner, Worcester, Mass., assignor to
Crompton & Knowles Loom Works, Worcester,
Mass., a corporation of Massachusetts

Application November 6, 1948, Serial No. 58,736

5 Claims. (Cl. 139—217)

1

This invention relates to weft tensions for loom shuttles and it is the general object of the invention to provide a weft tension constructed in such manner as to avoid abrasion and likelihood of cutting of the weft.

A form of weft tension which has gone into general use employs a pair of pads which are spring pressed toward the weft which passes between the pads. The lower ends of these pads are loosely mounted for limited free movement about a supporting pin and their upper ends are provided with laterally extending guide fingers which extend into holes formed in the threader block of the shuttle. The pads have vertically extending flat friction surfaces which generally terminate in straight vertical edges. When the shuttle is checked near the end of its flight the laterally extending fingers due to their momentum rock the pads in such manner that the weft is pinched between adjacent vertical edges of the flat friction faces. When fine weft is used this pinching may cause sufficient weakening of the thread to cause it to break on the next pick of the shuttle.

It is an important object of the present invention to provide the pads with counterbalances or the like the effect of which is to oppose the tendency of the laterally extending fingers to turn the pads when the shuttle is checked. These counterweights may take the form of extensions at the bottoms of the pads and each pad will be formed with a flat friction surface with its guide finger and counterweight located on opposite sides of the surface.

It is a further object of the invention to provide an improved tension pad which will be dynamically balanced about a vertical line extending along the friction surface thereof.

It is a further object of the invention to place one of the counterweights in such position that it will act as a guard to prevent the weft from falling between the supporting pin and one or the other of the pads where it might be cut.

With these and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts hereinafter described and set forth.

In the accompanying drawings, wherein a convenient embodiment of the invention is set forth,

Fig. 1 is a plan view of one end of a shuttle made according to the present invention,

Fig. 2 is an enlarged vertical section on line 2—2 of Fig. 1.

2

Fig. 3 is a plan view of the pads looking in the direction of arrow 3, Fig. 2, and

Fig. 4 is a perspective view of the two pads used in the shuttle tension.

As shown in Figs. 1 and 2, the shuttle S has a bobbin compartment 10 in which is located a bobbin B from which the weft W unwinds when the shuttle is in flight. The weft passes through a threader block 11 secured to the shuttle in any approved manner and issues from a delivery eye 12 which is generally located in relatively low position on the front wall of the shuttle. To accommodate the weft the shuttle block is provided with a thread passage 13 which extends in a direction longitudinally of the shuttle and is open at its upper end to receive the thread.

Extending transversely of the threader block 11 is a guide or supporting pin 15 on which front and back tension pads 16 and 17 respectively are mounted for limited free motion. In order to provide this motion the lower end of each pad is provided with a hole 18 the diameter of which is slightly larger than the diameter of the pin 15. The upper end of pad 16 is provided with a laterally extending finger 20 which extends into a hole 21 in the front wall 22 of the threader block 11, and in similar manner the upper end of pad 17 is provided with a laterally extending guide finger 23 extending into a hole 24 in the back wall 25 of the threader block. The fingers 20 and 23 have a loose fit with their corresponding holes and this fact together with the manner of mounting the pads on the pin 15 permits the pads to have limited free movement both vertically and horizontally in a direction lengthwise of the shuttle.

Each pad is provided with means for urging it toward the other pad, this means generally comprising a light spring. As shown more particularly in Fig. 2 front wall 22 has threaded therein a screw 26 which backs up a weak compression spring 27 which bears rearwardly against the front pad 16, and similarly the rear wall 25 is provided with a screw 28 which backs up a spring 29 for the rear pad 17. These two springs are of approximately the same strength and urge the pads toward each other so that the vertical friction substantially flat surface 29 of the front pad 16 will be held against a similar surface 30 on the rear pad 17. The weft thread ordinarily passes between the two pads and the springs acting through the pads exert a frictional force on the weft which tensions it.

The matter thus far described is of common construction but is so made that in operation the

offset or laterally extending guide fingers 20 and 23 cause slight angular motions of the pads around a vertical axis when the shuttle is checked near the end of its flight, thereby pinching the weft and weakening it so that it is likely to break in the next pick of the shuttle.

In carrying the present invention into effect each pad is provided with a lateral extension which counterbalances the guide finger thereof. As shown in Fig. 4 the front pad 16 has the lower end thereof formed with a lateral extension 35 extending to the left or in a direction opposite to that in which the guide finger 20 extends. The lower rear wall 25 of the threader block can have a portion thereof removed if desired to define a recess 36 to accommodate the counterweight 35. The lower end of the rear pad 17 is provided with a forwardly extending counterweight or wing 37 which occupies a recess 38 in the lower part of the front wall 22 of the threader block 11.

These laterally extending wings or counterweights 35 and 37 are made of such size that their weight will counteract the tendency of the guide fingers 20 and 23 to rock or turn the pads as already described when the shuttle is checked near the end of its flight. Thus, as the shuttle is checked the guide finger 20 of the front pad tends by its momentum to move the pad 16 angularly around one or the other of its vertical edges 40 as an axis, but the counterweight 35 exerts the same tendency except that it tries to turn a pad angularly in the opposite direction with the net result that the two tendencies to turn are counteracted and the pad retains its normal position even though the shuttle suffers a sharp reduction in its speed when being checked. Similarly, the counterweight or wing 37 offsets the tendency of the guide finger 23 to turn the rear pad around one or the other of its vertical edges 41 as an axis. Throughout the flight of the shuttle therefore normal tension is preserved on the weft without regard to changes in the rate of travel of the shuttle. By referring to Fig. 2 it will be seen that the top edge 42 of wing 37 extends across the front pad at a level above supporting pin 15 and thus keeps the weft W from falling onto the pin where it might be cut by the pads as they move laterally of the shuttle.

From the foregoing it will be seen that the invention sets forth simple means, such as counterweights, by which the pads of the shuttle tension are prevented from being moved angularly due to the momentum of their guide fingers when the shuttle is checked. It will also be seen that the counterweights or wings do not interfere with normal passage of the weft between the pads and through the thread passage 13. Furthermore, the counterweight 37 as shown more particularly in Fig. 2 extends from the rear pad 17 forwardly across the space between the vertical faces of the pads ordinarily occupied by the weft and prevents the latter from falling to the level where it might be pinched between the pads and the guide pin 15. Also, the invention sets forth a tension pad which is dynamically balanced about a vertical axis extending preferably along the weft engaging friction surface thereof.

Having thus described the invention it will be seen that changes and modifications of the foregoing specific disclosure may be made without departing from the spirit and scope of the invention.

What is claimed as new is:

1. In weft tension mechanism for a loom shuttle having a threader block, a pair of ver-

tically extending tension pads mounted on the block, a laterally extending finger on each pad effective due to momentum thereof tending when the shuttle is checked near the end of its flight to tend to cause angular movement of the pad, and a counterweight on each pad on the side thereof opposite the corresponding finger and movable relatively to the shuttle and counteracting the tendency of the corresponding finger to cause said angular movement.

2. In weft tension mechanism for a loom shuttle having a threader block, a pair of vertically extending tension pads mounted on the block, a laterally extending finger on at least one of said pads tending due to the momentum thereof to cause angular movement of said one pad when the shuttle is checked near the end of its flight, and a counterweight on said one pad movable relatively to the shuttle on the side of the pad opposite said finger effective due to the momentum thereof when the shuttle is checked to prevent said finger from causing said angular movement.

3. In weft tension mechanism for a loom shuttle having a threader block, front and back vertically extending tension pads mounted on the threader block, a finger extending forwardly from the front pad into the block and a second finger extending rearwardly from the back pad, said fingers due to their momentum tending to cause angular movements of their corresponding pads when the shuttle is checked in its flight, a counterweight on the front pad extending rearwardly therefrom, and a second counterweight on the back pad extending forwardly therefrom, said counterweights preventing the fingers from causing said angular movements of said pads when the shuttle is checked.

4. In weft tension mechanism for a loom shuttle having a threader block, a pair of vertically extending tension pads mounted on the block, a guide pin on the block for the lower ends of said pads, a laterally extending finger on at least one of said pads tending when the shuttle is checked to cause angular movement of said one pad, and a counterweight on said one pad preventing the finger from causing said angular movement and extending above said guide pin and under the weft to keep the latter above and out of engagement with the guide pin.

5. In weft tension mechanism for a loom shuttle having a threader block, a pair of vertically extending tension pads mounted on the block, a laterally extending finger on each pad tending due to the momentum thereof when the shuttle is checked near the end of its flight to cause angular movement of the pad, and a counterweight on each pad movable relatively to the shuttle and effective due to the momentum thereof when the shuttle is checked to counteract the tendency of the corresponding finger to cause said angular movement, the counterweight of one of said pads extending across the other pad in position to support a weft thread between said pads.

RICHARD G. TURNER.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
749,353	Baldwin	Jan. 12, 1904