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THREADING BLOCK FOR LOOM SHUTTLES

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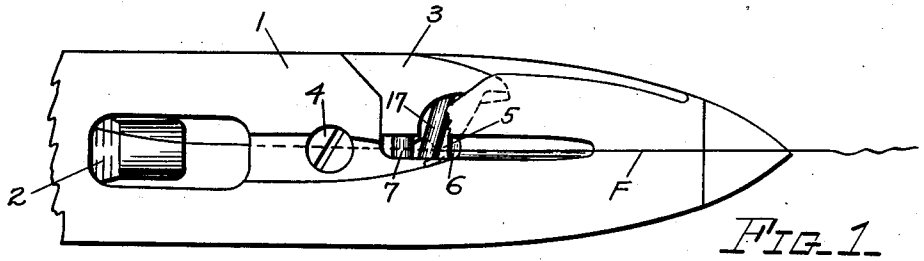


FIG. 1

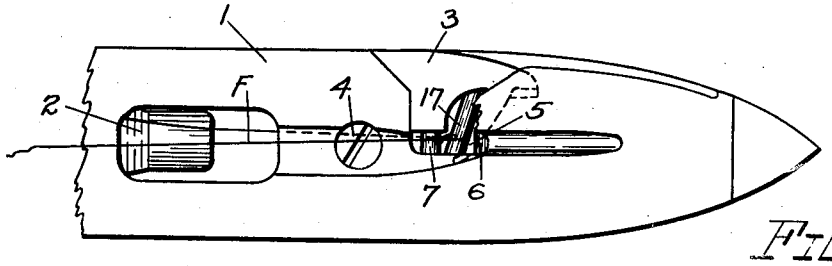


FIG. 2

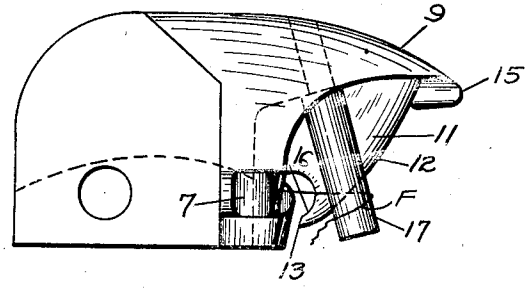


FIG. 3

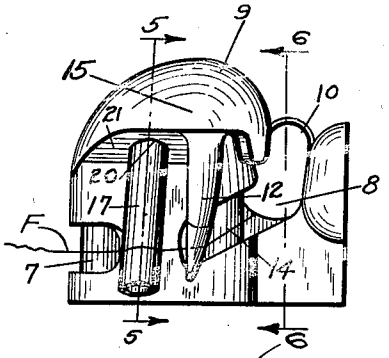


FIG. 4

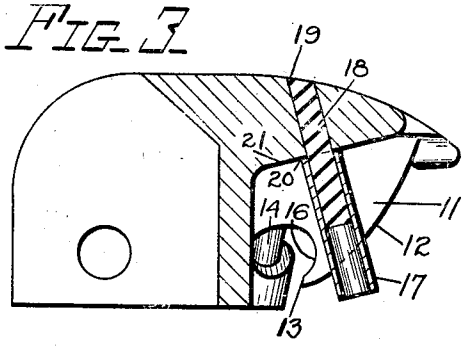


FIG. 5

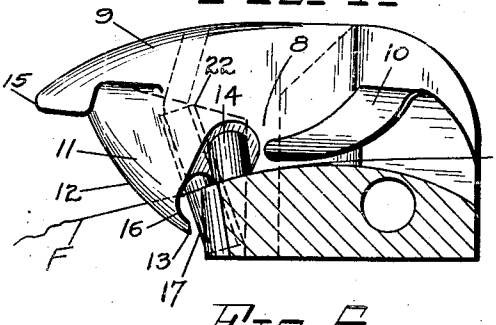


FIG. 6

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THREADING BLOCK FOR LOOM SHUTTLES

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7 Claims. (Cl. 139—212)

This invention relates to shuttles for automatic filling replenishing looms, and more particularly to improvements in threading blocks for such shuttles.

During the normal operation of a fly shuttle loom, the shuttle is picked back and forth across the lay to place a filling thread in the shed in a position to be woven in the warp threads. At each end of the lay is placed a shuttle box which checks the flight of the shuttle and holds it in position for the return pick. At the end of a pick, a length of filling extends from the selvage to the shuttle in the box.

The filling thread is drawn from the shuttle under a slight tension while being laid in the shed. However, at the start of a pick the filling is in a slack condition until the shutted has traveled far enough to cause the filling thread to be caught at the selvage and the length thereof formerly extending from the selvage to the shuttle box to be distributed through the shed.

The slack condition of the filling introduces the possibility of two undesirable results; one is that the filling will be permitted to become entangled in the threading block in such a manner that it will be prevented from being drawn from the shuttle, and consequently will be broken; the other is that the slack will be taken up so abruptly that the resultant stress will be greater than the filling thread can stand and it will break.

Our invention is designed to prevent these conditions from occurring.

It is an object of this invention to provide for a shuttle a threading block having means incorporated therewith which will hold the filling thread in the block in its proper operative position during all loom operations, and which will act to relieve the high initial stress placed on the filling when the slack thereof is taken up, such means comprising a simple, resiliently mounted member placed in the threading block in a position to cooperate with the other elements thereof and with the filling thread to produce the desired result.

The foregoing and other objects may be accomplished by the construction illustrated on the accompanying drawing, which shows an exemplary embodiment of the invention, and in which:

Fig. 1 represents a portion of a loom shuttle in elevation, having the improved threading block mounted therein, and shows the disposition of some of the parts when the filling is being drawn from the side eye and toward the most adjacent end of the shuttle;

Fig. 2 represents the same shuttle portion as shown in Fig. 1, but shows the disposition of the parts when the filling thread is being drawn toward the opposite end of the shuttle;

Fig. 3 represents a side elevation of the threading block removed from the shuttle, and shows the positions of the parts when there is no tension on the filling thread;

Fig. 4 represents an end view of the same;

Fig. 5 represents a side elevation of the threading block with parts thereof in section, and shows a means for securing the resiliently mounted member thereon, taken on the line 5—5 of Fig. 2.

Fig. 6 represents a sectional elevation view of my threading block taken through the thread passage, and shows the resilient mounted member in a fully retracted position. This view is taken on the line 6—6 of Fig. 2.

In the drawing, 1 represents a portion of a loom shuttle of well known construction. As is common in the art, a filling carrier 2 is placed in the body of the shuttle, and one end of the shuttle is recessed to accommodate a threading block 3, affixed thereto, as by the bolt 4.

The filling thread F is led from the carrier 2, through the threading block 3 and out of an eye 5 in the side of the shuttle, from when it is drawn from side to side of the loom, bearing alternately on the posts 6 and 7, during the weaving operation.

The threading block may comprise a longitudinal thread passage 8 communicating with the top of the block 9. Within the passage may be affixed a scroll member 10 forming a trap to prevent the thread from swirling out of its proper operative position.

Extending downwardly from the under surface of the top portion of the block may be the horn 11 having a thread guiding surface 12 and a tip portion 13.

At a point in the thread passage adjacent the horn is placed a post 14 to provide a smooth and long wearing bearing surface for the thread.

After a filling replenishing operation has taken place, an end of the filling extends from the filling carrier in the shuttle to a filling end holder on the magazine. During the reciprocation of the lay immediately after transfer, the filling end is biased outwardly of the shuttle and towardly the side eye thereof, and it is in a position to contact the upper surface 9 of the threading block.

The form of the surface 9 is such that the filling end is led down into the passage 8 and over the rounded end 15 of the block, on to the

thread guiding surface 12 of the horn 11. The filling end is guided downwardly under the influence of the form of the surface 12. On reaching the end portion 13 the filling end travels around the point of the horn and upwardly along the other side 16 thereof. It now rests in a position along the bottom of the thread passage, around the post 14, under the horn and forwardly through the side eye of the shuttle. This is the normal position it assumes during loom operation, as is well known in the art.

By our invention, we provide a means resiliently to engage the filling as it passes through the threading block to take up some of the slack which occurs in the filling from time to time, as is normal in this form of threading block, and to prevent the filling from being placed under such stress that it will become parted when the excess slack is eliminated.

To accomplish these ends we have provided a threading block with a resiliently mounted member 17. This member may be tubular in form, of a suitable material to withstand the wearing action of the filling thread which constantly is running over it.

In the form of our invention shown on the drawings, an opening 19 is provided in the threading block in axial alignment with the tubular member 17 when the latter is placed in its free position, that is, when it is not engaged by a filling thread, as shown in Fig. 3. A cylindrical portion of rubber 18 is then fixedly secured in the tubular member 17 and in the opening 19 to provide a means for securing the parts together.

The member 17 is placed so that the upper terminus 20 thereof abuts the under surface 21 of the top portion of the threading block. By this arrangement, when the member 17 is deflected from the free position some part of the upper portion 20 will contact the surface 21, as at 22, Fig. 6. The rubber connecting element will be bent and placed under tensile stress, and cause the member 17 to be urged toward its free position.

The member 17 is mounted on the threading block in a position forwardly of the horn 11, that is, between the horn and the side eye of the shuttle, and is placed at an angle to project beyond the thread guiding face 12 above the point where the filling thread normally would rest on the surface 16 of the horn.

With this construction, when a filling end is being threaded through the threading block, in a manner analogous to that previously described, during its travel along the guide surface 12 it will contact the element 17. Under the force of the tension in the filling thread the member 17 will be moved inwardly toward the body of the threading block, finally to assume a position similar to that shown in Fig. 6.

During its travel the filling thread will go around the end 13 of the horn and upwardly along the member 17 in a position where further movement will be halted by contact with the surface 16.

The filling thread will now be positioned in the thread passage 8, around the post 14, in contact with the member 17 and the surface 16, and forwardly through the side eye of the shuttle.

The end 13 of the horn 11 is given a hook-like formation to form a thread trap, in cooperation with the member 17, to assure that the filling thread will retain a proper operative position in the threading block.

When the tension on the filling thread is released, the member 17 will tend to return toward its original position. In doing so it will take up the slack in the filling thread until the force of the tension in the thread equals the force exerted by the resilient medium 18, at which point the member 17 will come to rest.

During normal loom operation the filling thread will be under some degree of tension while it is being laid in the shed, and the member 17 will assume a position intermediate between the free and the fully retracted positions. Figs. 1 and 2 show the approximate positions of the member 17 under these conditions. It has been found that the positions of the member 17 will be approximately the same when the shuttle is traveling in either direction along the lay.

When there is no tension on the filling thread, as occurs when the shuttle is first picked from a shuttle box, the member 17 will return to its free position, where it will be engaged by the slack filling thread.

It will be seen from the disclosed form of our invention that when tension is first applied to the filling thread, the impact of the load will be absorbed by the member 17 with increasing resistance, until the filling thread is brought from its slack condition to that wherein it is under normal operating tension.

It will be soon, also, that when the member 17 urges the filling thread outwardly of the threading block, as it will during normal operating conditions, it will cause it to be seated in the hook-like portion 16 of the horn 11, and thereby reduce the tendency of the filling to become entangled with, or disengaged from, the threading block.

Where no provision is made for resiliently taking up the slack in the filling thread, there is a possibility that when the shuttle has traveled far enough to take up the initial slack, the thread suddenly will be placed under excessive tension with the likelihood that it will become parted. By providing a resiliently mounted member to engage the filling thread within the threading block, as shown in our invention, we have supplied a means which permits the tension to be applied comparatively slowly and evenly, in a manner to prevent a sudden impact from occurring with the deleterious effects that follow.

Having thus disclosed a preferred embodiment of our invention, we claim:

1. A threading block for a shuttle for use in an automatic filling replenishing loom, comprising a threading block having a thread passage therein through which a filling thread may be drawn, and an element secured to the top portion of said block and extending downwardly therefrom to engage the said filling thread, said element being resiliently mounted in said block to engage said filling thread in a manner to reduce a slack condition occurring in said thread.

2. A loom shuttle comprising a shuttle body arranged to carry a supply of filling thread, thread delivery means in said shuttle including a threading block having a longitudinal thread passage, a side delivery eye in said shuttle, an element located wholly between said longitudinal thread passage and said side delivery eye to engage a filling thread running there-between, and a resilient member extending downwardly from said block and supporting said element in a manner to restrain said filling thread from assuming a slack condition.

3. A loom shuttle comprising a shuttle body

arranged to carry a supply of filling thread, thread delivery means in said shuttle including a threading block having a longitudinal thread passage therein, a side delivery eye in said shuttle, and a resilient member secured to the top portion of said threading block, and an element supported by said resilient member and projecting downwardly in a position between said longitudinal thread passage and said side delivery eye resiliently to engage a filling thread extending through said longitudinal thread passage and said side delivery eye in a manner to restrain said filling thread from assuming a slack condition.

4. A threading block for use in a loom shuttle, comprising a threading block having a longitudinal thread passage therein, a horn adjacent one end of said thread passage and projecting downwardly from the top portion of said block, said horn having thread engaging surfaces, one of said surfaces having a hook-like formation, a resilient element mounted on the top portion of said block and projecting downwardly therefrom, and thread engaging means supported by said element, said thread engaging means being located adjacent said horn in a position resiliently to engage a filling thread contacting said thread engaging surface of hook-like formation to hold said filling thread in contact with said surface of hook-like formation.

5. A loom shuttle comprising a shuttle body arranged to carry a supply of filling thread, thread delivery means in said shuttle including a longitudinal thread passage, a side delivery eye in said shuttle, an element located wholly between said longitudinal thread passage and said side delivery eye, and means depending from said thread delivery means for resiliently supporting said element, said element being positioned to engage a filling thread running from said longitudinal thread passage to said side delivery eye and capable of movement transversely of the path assumed by said filling thread, said element being constructed and arranged to absorb impact loads placed on said filling thread.

6. In a threading block for loom shuttles, a resiliently mounted means comprising a tubular element, a resilient means of elongated form having one end secured in said tubular element and the other end projecting from said tubular element and in axial alignment therewith, an opening in said threading block to receive the projecting end of said resilient element, said projecting end being secured in said opening to support said tubular element in a resilient manner on said threading block.

7. In a threading block for loom shuttles, a resiliently mounted means comprising a tubular element, a resilient element having one portion thereof secured within said tubular element and another portion thereof projecting from said tubular element and in axial alignment therewith, and means on said threading block to hold said projecting portion in a manner to permit resilient movement of said tubular element relative to said threading block.

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