Feb. 15, 1944. I. SNOW 2,341,848

THREADING BLOCK

Filed Dec. 29, 1941

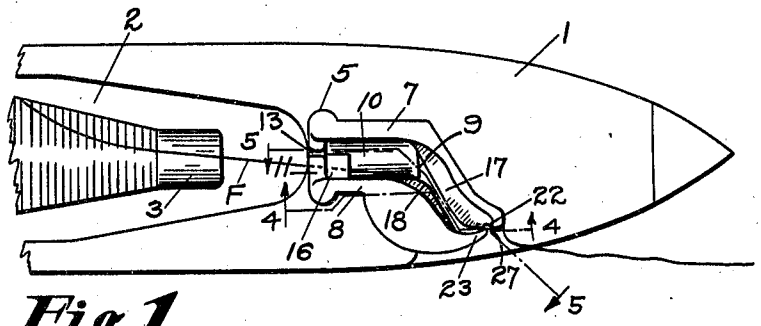


Fig. 1.

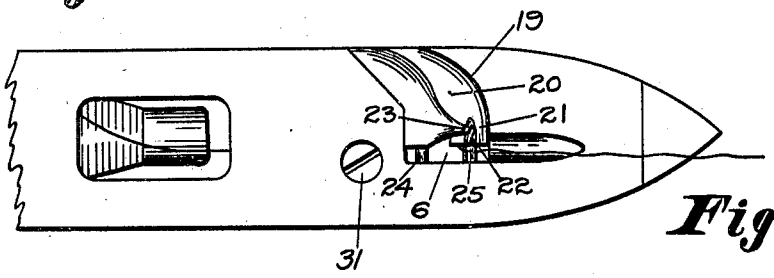


Fig. 2.

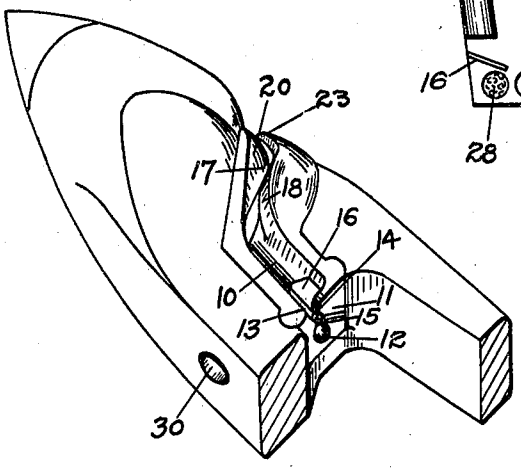


Fig. 3.

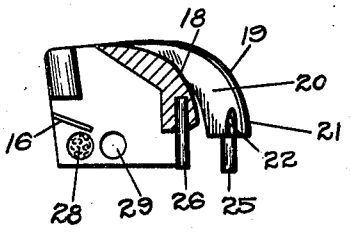


Fig. 4.

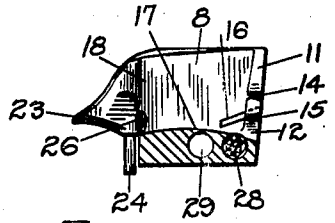


Fig. 5.

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THREADING BLOCK

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2 Claims. (Cl. 139—223)

This invention relates to an improvement in threading blocks for shuttles to be used in automatic filling replenishing looms.

In looms where the filling carrier in the shuttle is automatically replaced when the filling thereon is exhausted and a new filling carrier is substituted without delaying the operation of the loom, means must be provided for getting the new filling threaded through the side delivery eye of the shuttle and in proper operating position. It is desirable that this be accomplished as soon after transfer of the new filling carrier as possible.

It is well known in the loom art that the incoming filling end can be threaded through the side delivery eye during the course of a plurality of picks of the loom. Usually the filling is partially threaded in the threading block on the first pick and placed in such a position that on a subsequent pick it will be completely threaded and deposited in the side delivery eye.

In employing this method for threading the shuttle, the difficulty often arises that during loom operations subsequent to the transfer the filling becomes unthreaded from the partially threaded block before it can be secured in the side delivery eye. When this happens the loom must be stopped and the defect repaired, with the resultant loss of time and decrease in productive capacity.

In attempting to find a solution for this difficulty, it has been proposed to provide an auxiliary mechanical or pneumatic device which would thread the filling through the side delivery eye in coordination with the transferring operation, and before the first pick. Such devices have not proven commercially successful.

It is an object of the present invention to provide for use in an automatic filling replenishing loom a threading block in a shuttle which will cause the filling from a replenished filling carrier to be threaded through the block and deposited in the side delivery eye during the flight of the shuttle on the first pick after transfer.

It is a further object of this invention to provide for use in an automatic filling replenishing loom a threading block for a shuttle in which the thread guiding surfaces are so formed that a filling from a carrier placed in the shuttle will be induced to be threaded through the threading block and become deposited in the side delivery eye in an operative position from which it cannot escape while the shuttle is travelling away from the filling replenishing mechanism of the loom during the first pick of the shuttle after transfer.

These and other objects may be accomplished by the construction illustrated by the accompanying drawing, in which:

Fig. 1 represents a plan view of a portion of a shuttle showing my improved threading block in place therein, and with a filling end threaded through it.

Fig. 2 is a side elevation of the portion of the shuttle shown in Fig. 1.

Fig. 3 is a perspective view of a portion of a shuttle containing my threading block, showing the form and direction of the thread passage in the block.

Fig. 4 is a sectional view of the threading block alone taken on the line 4—4 of Fig. 1.

Fig. 5 is a sectional view of the threading block alone taken approximately on the line 5—5 of Fig. 1.

In the following description of the relative location of parts the shuttle will be considered as resting in the shuttle box on the side of the loom containing the magazine and transfer mechanism. In this position, outwardly will be taken to mean a direction away from the selvage of the cloth and toward the adjacent side of the loom; forwardly will denote a direction toward the front of the loom.

During the normal operation of a loom, when the filling on the filling carrier in use in the shuttle becomes exhausted a feeler mechanism on the loom detects the absence of filling and causes a transfer mechanism to be placed in operation to put a new filling carrier in the shuttle and eject the old one therefrom. After transfer, a filling end extends from the new filling carrier to the magazine, where it is secured to a thread holder.

Before the loom can operate properly, it is necessary that the filling from the filling carrier be led through the side delivery eye in the shuttle from whence it can run to be laid in the shed as the shuttle is picked back and forth across the lay. It is the purpose of the threading block to receive the new filling end and automatically to conduct it to the side eye and deposit it therein in proper operating position. All of the foregoing procedure is well known in the loom art.

The present invention is concerned with a means for conducting a filling end from the filling carrier in the shuttle to the side delivery eye more expeditiously than has been done heretofore.

The drawing shows part of a shuttle 1 of a type commonly employed in automatic filling replenishing looms and to which my threading block is applied by way of example. It has an opening 2 to receive a filling carrier 3, parts of each of

which are shown. The filling carrier may be secured within the opening in the shuttle in a well known manner, not illustrated herein.

During operation of the loom, the filling thread F is led from the filling carrier through a threading block 5 to an eye 6 formed in a side of the shuttle, from whence it is continuously drawn.

The threading block may be made in a single piece and may comprise a rear wall 7 and a front wall 8. Included between the walls is a passage 9 through which the filling thread runs. The passage is necessarily continuous from the opening 2 to the side eye 6, and it is open at the top, except for thread traps placed at each end, to permit a filling thread readily to be introduced into it from the top throughout the whole length thereof.

At the part nearest the opening 2, the passage is made in axial alignment with the shuttle as indicated at 10. At the end of the passage 9 adjoining the opening 2 the threading block is formed with a wall 11 extending substantially across it: The wall has an opening 12 therein, in alignment with the passage 10, in which the filling thread normally is confined. Communicating with the opening 12 is a substantially vertical passage 13 the other end of which terminates at the top of the wall. Projections 14 and 15 are placed partially across the passage 13 and formed in a manner to permit easy access of a thread from the top of the wall to the opening 12, but making egress from the opening difficult.

Within the passage 9 and adjoining the walls 8 and 11 is a plate 16, placed at a slight angle to a horizontal position. The plate is set slightly above the bottom of the passage 9 and is spaced from the wall 7 so that a thread may enter beneath the plate and be confined in the space 17. The opening 12, projections 14 and 15, and plate 16 cooperate to bring the filling to a position at the bottom of the passage 9, and to keep it there during the operation of the loom.

A friction element 28 may be inserted in the bottom of the passage 9 to engage the filling thread and increase the tension therein an amount sufficient to cause it properly to be distributed through the shed.

An opening 29 may be provided in the body of the threading block corresponding in position with an opening 30 in the shuttle through which a bolt 31 may be passed to secure the parts together.

In progressing along the passage 9, the straight portion 10 merges into a portion 17 which proceeds diagonally from the center of the shuttle in a direction outwardly and forwardly thereof toward the side delivery eye. At the juncture of the passages 10 and 17, the wall 8 of the block is formed with an inclination from the vertical such that the bottom of the wall is nearer the center of the passage 17 than is the top. The wall, then, slopes downwardly and outwardly, as shown at 18.

The wall 7, as it approaches the passage 17, is formed with a rounded top edge 19 which leads from the level of the top of the block to that of the side eye. The portion 20 of the wall 7, facing the passage 17, is smoothly rounded and formed with its thread contacting surfaces inclined outwardly and downwardly, and forwardly toward the side eye.

The wall portion 20 evolves into a rounded portion 21 which is substantially tangential to the longitudinal side of the shuttle. Formed in the portion 21 is a shallow cavity 22. The wall 8 of the threading block, in the region adjacent the side eye, has formed thereon a horn-like projection 23, which terminates close to the wall portion 21. The end of the projection 23 is placed just within the cavity 22, sufficient space 27 being provided around the terminus of the projection to permit a thread to pass over it and into the side eye. The projection 23, in cooperation with the wall portion 21 and cavity 22 therein, forms an efficient trap to permit a thread to enter the side eye but prevents it from escaping therefrom.

The side eye has posts 24 and 25 at each side thereof to provide a smooth running, long wearing surface for the filling thread. A post 26 is placed at the juncture of the passage portions 10 and 17 for a like purpose.

In the operation of the loom, immediately after transfer the lay moves rearwardly and an open shed is provided through which the shuttle may travel. Since the shuttle moves rearwardly with the lay away from the magazine to which the incoming filling end is attached, the filling end assumes a position diagonal to the longitudinal axis of the shuttle. As the shuttle travels through the shed the filling tends also to assume a position approximately as the middle elevation thereof. Therefore, as the shuttle travels, the filling end is biased toward the position of the side delivery eye.

In the unwinding from the filling carrier presently secured in the shuttle, the filling swirls about, with the axis of the carrier as a center. The axis of the carrier, extended, intersects the center of the opening 12.

The action of the filling on unwinding is such that it enters the vertical passage 13 and works past the projections 14 and 15 until it becomes entrapped in the opening 12 and under the plate 16.

One part of the filling now rests on the bottom of the passage portion 10, and another portion extends therefrom outwardly toward the point of the shuttle and transversely toward the side eye. Both portions have forces acting on them biasing them toward the central horizontal plane of the shuttle. Under the action of these forces the filling enters the passage 9 through the open top portion thereof and contacts the inclined walls 18 and 20. The forms of these wall portions are such as to guide the filling through the passage 9 and toward the side eye 6.

On reaching the projection 23 at the eye end of the passage the filling is led through the opening 27 between the projection 23 and the wall portion 21 and becomes entrapped in the side delivery eye. The filling thread now extends throughout the length of the thread passage and is confined at both ends thereof. It will retain this position during the operation of the loom.

It will be noted that the whole threading action takes place while the shuttle is travelling in one direction, that is away from the magazine, and there is no reverse motion of the shuttle necessary to bring the filling down into the side eye.

It becomes apparent, therefore, that I have provided a threading block for a shuttle which will thread completely during the flight of the first pick after the transfer of a filling carrier to it, and have provided a means for preventing faulty operation of the loom resulting from the filling becoming unthreaded from the threading

block on operations of the loom occurring subsequent to the first pick.

Having thus described a preferred embodiment of my invention I claim:

1. In an automatically threading shuttle having an opening therein to accommodate a filling carrier, a threading block secured in one end of said shuttle and having a thread passage leading from said opening to a side delivery eye in the shuttle wall, said thread passage having a portion leading directly outwardly from said opening and another portion communicating with said first portion and leading diagonally therefrom and in a forward direction to said side delivery eye, a substantially vertically disposed thread guiding surface at the juncture of said two passage portions directed outwardly and forwardly to lead a thread toward the side delivery eye, a second thread guiding surface in said diagonally disposed passage cooperating with said first thread guiding surface to lead the thread into the side delivery eye, a projection formed on one side of said diagonally disposed passage at the part thereof adjacent the side delivery eye and extending across said passage above said eye substantially to, but in spaced relationship with, the other side of said passage, an opening between said projection and said other side of said diagonally disposed passage through which a thread may enter the side delivery eye, said projection being disposed to prevent a thread from entering said diagonally disposed passage from said side eye, the parts of said thread passage being disposed to cause the thread from the filling carrier to enter the said side delivery eye of the shuttle during the first pick thereof after transfer.

2. An automatically threading shuttle for an automatic filling replenishing loom, said shuttle having an opening therein to receive a filling carrier, a side delivery eye in the shuttle near one end thereof, and a threading block having a thread passage communicating with said opening and said delivery eye, said thread passage being open at the top and having substantially vertically disposed thread guiding surfaces, said passage being formed to lead a thread outwardly from said opening and thence diagonally, forwardly and outwardly, to said delivery eye, said substantially vertically disposed surfaces being directed forwardly and outwardly to lead the thread into the side delivery eye, an obstruction placed substantially across said thread passage adjacent said side eye and having an opening there-through to enable a thread easily to enter said side eye but preventing a thread from becoming disengaged therefrom, a plate across the end of said thread passage nearest said opening in said shuttle, said plate having a vertical opening therein communicating with the top of said thread passage, projections extending transversely of said vertical opening from one side thereof and inclined downwardly, said projections being in spaced relationship with the other side of said vertical opening and arranged to permit a thread to descend to the bottom of said thread passage, a projecting member in said thread passage placed in a position outwardly of said plate, said member extending partially across said thread passage near the bottom thereof and inclined outwardly and downwardly toward the bottom of said thread passage, a space between the bottom of said thread passage and said inclined member to accommodate the thread, said thread passage and the elements associated therewith being designed to cause the thread from the filling carrier to enter the side delivery eye of the shuttle on the first pick thereof after transfer.

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