

Jan. 1, 1935.

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1,985,960

LOOM SHUTTLE

Filed July 5, 1934

2 Sheets-Sheet 1

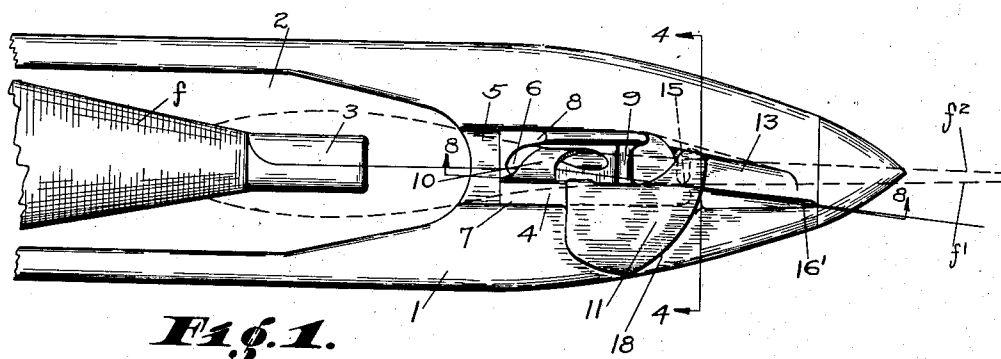


Fig. 1.

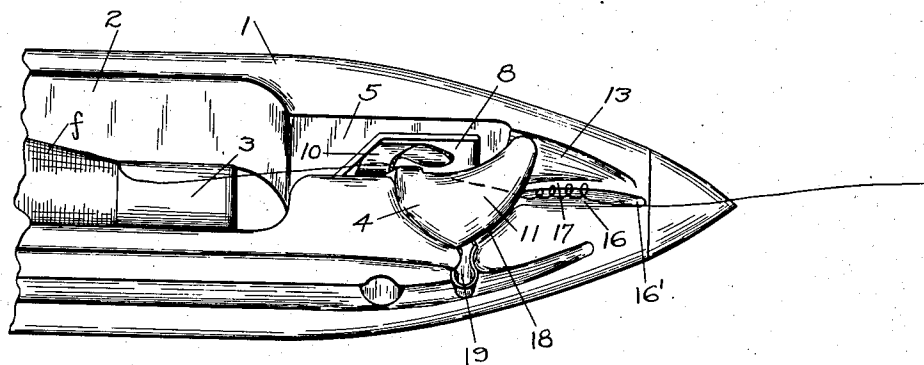


Fig. 2.

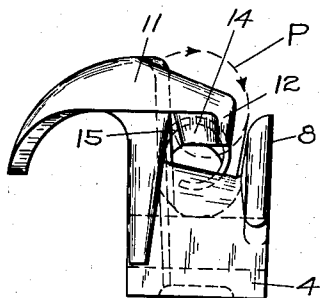


Fig. 3.

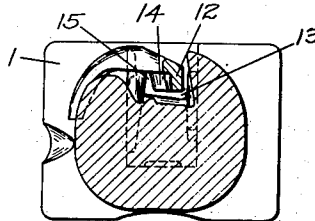


Fig. 4.

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2 Sheets-Sheet 2

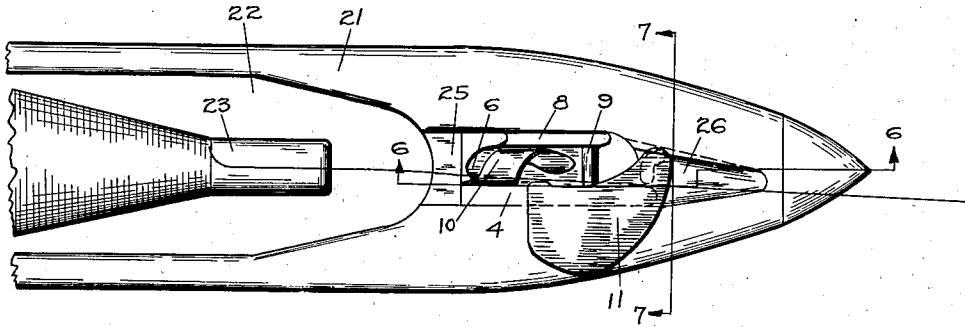


Fig. 5.

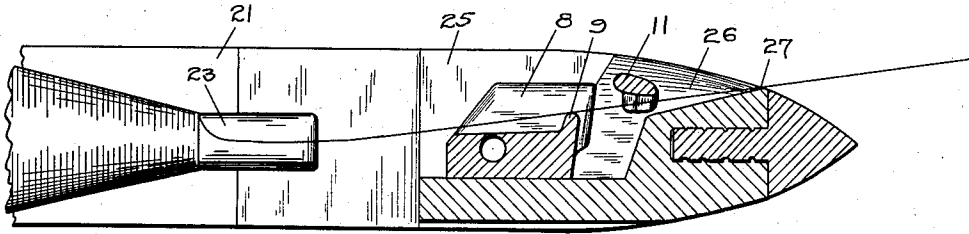


Fig. 6.

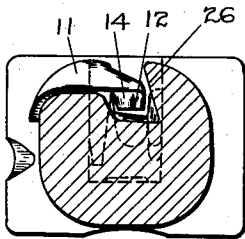


Fig. 7.

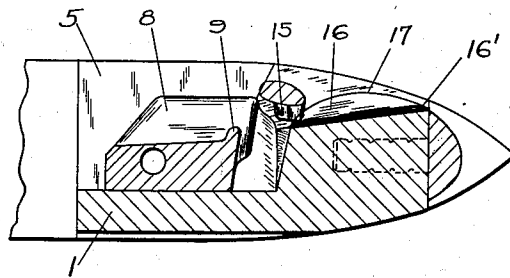


Fig. 8.

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LOOM SHUTTLE

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Application July 5, 1934, Serial No. 733,725

11 Claims. (Cl. 139—223)

The present invention relates to loom shuttles of the automatically threading type, for use in bobbin-changing looms.

This application is a continuation in part of my co-pending application, Serial No. 675,974, filed June 15, 1933.

Shuttles of the type mentioned are designed to have the bobbin or other filling carrier therein exchanged automatically when the supply of filling becomes substantially exhausted, and are likewise equipped with a threading block which partially threads up during the first pick after transfer of the new filling supply, and completely threads up during the next pick. The threading block is commonly provided with a thread guard such as a horn beneath which the filling is engaged when partially threaded, the horn being intended to hold the filling in place at the end of the first pick after transfer and at the beginning of the next pick. During this interval, the filling extending from the shuttle to the cloth selvage is slackened, and, in prior constructions, frequently becomes unthreaded from the block instead of threading down into the side eye as it should.

I have found that the unthreading of the filling from its partially threaded position beneath the horn occurs in two ways. First, the slackened filling, at the end of the first pick after transfer, may sway or be moved rearwardly to or beyond the end of the horn, so that at the beginning of the next pick it can rise up out of the threading block quite readily. Second, the slack filling may kink or twist into loops which may loop about the end of the horn and thus unthread when the shuttle is again picked.

It has been proposed to overcome the difficulties above mentioned, by the addition of further guards, hooks or other devices intended to control the filling and prevent its escape from beneath the horn. However, each such device added to the shuttle usually does little but add one more projection for catching or snarling the kinked filling, thus lessening rather than improving the efficacy of the shuttle.

My invention provides a construction wherein the partially threaded filling, at the time it is slack, is positively prevented from moving rearwardly, so that it cannot possibly lift out of the threading block at the beginning of the second pick after transfer. The holding of the filling forwardly in the threading block, in conjunction with an improved horn that projects a considerable distance rearwardly of the holding means,

also greatly lessens the possibility of loops catching on the horn. My invention provides means in the form of a trap which prevents all of the loops or kinks from reaching the rearward end of the horn. This latter means may be incorporated in the shuttle if the filling to be used therewith so requires.

The first embodiment of my invention, as illustrated on the accompanying drawings, includes both of the novel features above defined. The other embodiment omits the above mentioned trap means, this embodiment being less desirable than the first except for use with filling which does not tend to kink or loop excessively.

Referring to said drawings:

Fig. 1 is a fragmentary plan view of the thread delivery end of a shuttle constituting the afore-said first embodiment of my invention;

Fig. 2 is a perspective view of the shuttle of Fig. 1;

Fig. 3 is a front elevation of the threading block detached from the shuttle, this threading block being common to both said embodiments of my invention;

Fig. 4 is a view in cross-section, taken approximately on line 4—4, Fig. 1;

Fig. 5 is a view similar to Fig. 1 but showing the second embodiment;

Fig. 6 is a longitudinal sectional view, taken approximately on line 6—6, Fig. 5;

Fig. 7 is a view in cross-section, taken approximately on line 7—7, Fig. 5; and

Fig. 8 is a longitudinal sectional view, taken approximately on line 8—8, Fig. 1.

The shuttle of Figs. 1, 2, 4 and 8 is comprised of a shuttle body 1 having a longitudinally extending cavity 2 for the reception of a filling carrier such as bobbin 3, the latter being releasably held by any conventional means (not shown) which permits the filling carrier to be automatically replaced by a fresh one when the supply of filling thereon becomes substantially exhausted. The shuttle is of the automatically threading type, provided with a threading block.

The shuttle body is recessed as at 5 to receive the threading block 4. This block includes a floor 6 and front and rear walls 7 and 8 projecting upwardly on opposite sides of a longitudinally extending thread passage which is in axial alignment with the bobbin 3. A bridge 9 extends across the thread passage at the outer end of the walls, and the filling is confined in the thread passage by a conventional form of threading scroll 10.

The threading block is provided with a horn 11 which projects from the front wall 7 outwardly and rearwardly substantially entirely across the thread passage. It will be noted particularly that the rearward free end of the horn is very nearly in alignment with the rear wall 8, which is materially rearwardly of the axis of the bobbin. This is a departure from usual practice which is of importance for reasons hereinafter explained.

The free end of the horn 11 turns downwardly as at 12 and enters a channel 13. This channel is preferably, though not necessarily, formed in the wood of the shuttle body, and it extends longitudinally of the shuttle outwardly from the recess 5.

It may be well to note here that in these specifications and the appended claims I employ such terms as "outwardly", "rearwardly" and "front" as though the shuttle were positioned in a loom. Thus, the side containing the side delivery eye is the front side of the shuttle and on Fig. 1 of the drawings "rearwardly" is away from the front wall toward the top of the sheet. By "outwardly" I mean in a direction longitudinally of the shuttle from the bobbin chamber toward the tip of the shuttle.

The threading block 4 is further modified from usual practice in that a depending lug 14 projects downwardly into the thread passage above mentioned. This lug may be formed integrally with the down turned end 12 of the horn, and has an approximately vertical front surface 15 for a purpose presently to be described. It is here noted that while the surface 15 or its functional equivalent is an important element of my invention in some of its aspects, other features of the invention may be enjoyed even though the lug be omitted entirely.

When a fresh bobbin is first transferred to the shuttle the filling end extends from the bobbin outwardly and upwardly to the conventional fixed end holder (not shown) as represented in Fig. 2. Then, as the shuttle is picked the filling unwinds from the bobbin and in so unwinding swirls or "balloons" in a definite, determinable path. The natural path of ballooning of the filling is approximately circular in cross-section. The dotted lines f' and f'' , Fig. 1, represent the forward and rearward limits of the ballooning.

It will be noted from Fig. 1 that the horn 11 extends rearwardly approximately to the rearward limit of ballooning of the filling, while the front surface 15 of the lug 14 is nearly at the forward limit of such ballooning. An unobstructed space is provided about the free end of the horn 11 and about the lug 14 so that the filling can balloon, in the path P, Fig. 3, downwardly about the horn, forwardly beneath the lug and upwardly in front of the surface 15. The filling is then "partially threaded", by which I mean that it extends from the bobbin through the thread passage, beneath the horn and on outwardly to whatever holding means is provided on the loom.

The filling remains in the partially threaded position throughout the remainder of the first pick. When the shuttle is boxed at the end of this pick the lay (not shown) moves forwardly and the filling becomes slackened. This slack filling has a tendency to kink and twist and, in prior art constructions, may become unthreaded from the horn. As above noted, such unthreading may occur through the filling moving rearwardly so that it can lift out rearwardly of the

horn or may occur by reason of loops of filling throwing onto and about the horn.

The first of these causes of unthreading is effectively eliminated in both said embodiments of my invention. In the embodiment of Fig. 1 the front surface of lug 14 holds the filling forwardly so long as the latter is engaged by the front surface 15. In order to prevent the slack filling from sagging out of control of the lug I have so constructed the shuttle body, outwardly of the horn, as to support the partially threaded filling well up from the bottom of the lug. The supporting point is designated 16' on the drawings and is best illustrated by Fig. 8.

The embodiment of Fig. 1 also includes means for positively controlling the loops of filling and prevent them from engaging about the horn. To this end, there is provided a space forwardly of the free end of the horn, in which space the filling runs while partially threaded, and a thread trap is positioned between such space and the free end of the horn. The space may be provided by means of a slot 16 which is conveniently formed directly in the shuttle body. This slot extends outwardly from the horn 11 substantially parallel to the channel 13, and is in alignment with the thread passage in the threading block, communicating directly with the recess 5.

The rear wall 17 of the slot, which wall is preferably approximately vertical, constitutes one form of thread trap, and is particularly efficient in this respect when aligned with the surface 15. As is clearly shown, the base of the wall is below the level of the down turned end 12 of the horn; and the wall, which is fixed, is of sufficient height to project materially above said down turned end. The top of the wall, at its inner end, curves downwardly to project beneath the horn.

Since the thread trapping wall is well forward of the free end of the horn the wall engages any loops of filling and effectively holds them forwardly so that they cannot engage about the horn. Furthermore, it will be noted that I have accomplished this desirable result without adding any projections which would tend to catch or snarl the filling.

It will be understood that after the shuttle is well started on the second pick after transfer the filling will slide down the passage 18 into the side delivery eye 19 in the usual manner.

Referring to Figs. 5, 6 and 7, the shuttle body 21 is provided with a cavity 22 to receive a bobbin 23 and is recessed at 25 to receive the same threading block 4 above described. The present embodiment omits the channel, slot and thread trapping wall above described and substitutes therefor one relatively wide groove 26 which extends from the recess 25 outwardly. The bottom of the groove 26 inclines upwardly and outwardly to provide a support 27 for the partially threaded filling as shown most clearly in Fig. 6. The groove is so formed as to provide an unobstructed path for the swirling filling about the horn 11 and lug 14, as in the first embodiment.

The operation of the construction of Figs. 5-7 is identical with that above described, except that the absence of a thread trapping wall may allow extremely large loops to engage about the horn 11. However, the front surface of the lug 14 holds the filling forwardly from the free end of the horn a sufficient distance that small loops cannot reach the free end of the horn. Consequently this embodiment is satisfactory for use with many characters of filling, which have no tendency to form large loops when slackened.

It may be added that shuttle blanks, i. e., shuttles recessed to receive a threading block but not equipped with such blocks, may be constructed in accordance with the invention illustrated by Figs. 1-4 but still adapted for use with preexisting threading blocks. Accordingly, such blanks constitute a marketable article of manufacture and I consider them to be of the present invention.

Having fully disclosed the preferred embodiment of my invention, I claim:

1. An automatically threading loom shuttle comprising a shuttle body containing a filling carrier in a cavity therein, a threading block having a longitudinally extending thread passage in alignment with said cavity, said threading block being provided with a horn which projects rearwardly across said thread passage to a point materially rearwardly of the axis of said filling carrier, and a lug projecting downwardly into said thread passage from the under surface of said horn and having its front surface positioned materially forwardly of the axis of said filling carrier, there being an unobstructed space around said horn and lug to allow the swirling filling during the first pick after transfer to pass freely downwardly about said horn, forwardly beneath said lug and upwardly in front of said front surface, said shuttle outwardly of said horn being constructed to support the partially threaded filling and prevent it from sagging below said lug.

2. In an automatically threading shuttle for bobbin changing looms, a shuttle body, a threading block in said shuttle body, said threading block having an open thread passage extending longitudinally therethrough and a horn projecting rearwardly over the said thread passage approximately to the rearward limit of the ballooning of the completely unthreaded filling, a lug projecting downwardly from the under surface of said horn into the thread passage, the front surface of said lug being positioned materially forwardly of the natural center of ballooning of the completely unthreaded filling, there being an unobstructed path about the rearward end of said horn and beneath said lug to allow the filling in ballooning as aforesaid to freely pass to its partially threaded position in front of said front surface, and means for preventing the partially threaded filling from escaping downwardly and rearwardly about said lug.

3. In an automatically threading shuttle for bobbin changing looms, a shuttle body, a threading block in said shuttle body, said threading block having an open thread passage extending longitudinally therethrough and a horn projecting rearwardly over the said thread passage to a point materially beyond the center of the natural ballooning of the completely unthreaded filling, a thread deflecting and guiding surface beneath said horn and materially forwardly of said center of ballooning, there being an unobstructed path about and beneath said horn and surface through which the filling may freely pass to its partially threaded position in front of said surface, and means for preventing the thus partially threaded filling from escaping from said surface in a direction to again become completely unthreaded.

4. An automatically threading loom shuttle comprising a shuttle body containing a filling carrier in a cavity therein, a threading block having a longitudinally extending thread passage communicating with said cavity, said

threading block being provided with a horn projecting outwardly and rearwardly across said thread passage and terminating in a channel communicating with the thread passage, there being a slot formed in continuation of said thread passage and extending outwardly beyond said horn in position to receive the running filling during the first pick after transfer, the said slot being separated from the said channel by a wall which serves to prevent the filling from kinking out of the slot into the channel.

5. An automatically threading loom shuttle comprising a shuttle body containing a filling carrier in a cavity therein, a threading block having a longitudinally extending thread passage communicating with said cavity, said threading block being provided with a thread guard projecting outwardly and rearwardly from the front wall thereof, the free end of said thread guard turning downwardly into a longitudinally extending channel, which channel communicates directly with said thread passage, there being a slot formed in continuation of said thread passage forwardly of said channel and extending outwardly beyond said thread guard in position to receive the running filling when the shuttle is partially threaded, the rear wall of said slot being positioned entirely forwardly of and below the free end of the thread guard and serving to prevent the filling from kinking rearwardly about the free end of the said thread guard.

6. An automatically threading loom shuttle comprising a shuttle body containing a filling carrier in a cavity therein, a threading block having a longitudinally extending thread passage in alignment with said cavity, said threading block being provided with an outwardly and rearwardly projecting horn the free end of which turns downwardly into a channel provided therefor, there being a space forwardly of said channel and beneath said horn through which space the running filling extends during the first pick after transfer and a thread trap between the said space and the said channel, said thread trap being comprised of a fixed wall positioned entirely forwardly of said channel and extending generally longitudinally of the shuttle, said wall being of a height to project materially above said down-turned end of said horn whereby to prevent the filling from kinking rearwardly about said horn.

7. An automatically threading loom shuttle comprising a shuttle body containing a filling carrier in a cavity therein, a threading block having a longitudinally extending thread passage communicating with said cavity, said threading block being provided with a thread guard which projects rearwardly across said thread passage and the free end of which turns downwardly into a channel provided therefor in the shuttle body, there being a space forwardly of said channel and beneath said thread guard through which space the running filling extends during the first pick after transfer, and a thread trap constituted by a wall extending longitudinally of the shuttle between the said space and the said channel, said wall being entirely forwardly of said down-turned end of said thread guard and projecting materially above the same.

8. An automatically threading loom shuttle comprising a shuttle body containing a filling carrier in a cavity therein, a threading block having a longitudinally extending thread pas-

sage communicating with said cavity, said
 threading block being provided with a horn which
 projects outwardly and rearwardly across said
 thread passage and the free end of which turns
 5 downwardly into a channel provided therefor in
 the shuttle body, there being a space forwardly
 of said channel through which space the running
 filling extends beneath said horn and outwardly
 longitudinally of the shuttle, a wall formed in
 10 said shuttle body between said space and said
 channel and extending outwardly from adja-
 cent the said horn, and a lug projecting down-
 wardly from the under surface of said horn
 and having its front surface substantially in
 15 alignment with the said wall.

9. An automatically threading loom shuttle
 comprising a shuttle body containing a filling
 carrier in a cavity therein, a threading block
 having a longitudinally extending thread passage
 20 communicating with said cavity, said threading
 block being provided with a horn which projects
 outwardly and rearwardly across said thread
 passage and the free end of which turns down-
 wardly into a channel provided therefor in the
 25 shuttle body, there being a slot formed in the
 shuttle body forwardly of the said channel which
 slot is in alignment with and communicates di-
 rectly with said thread passage and extends
 outwardly from said horn, and a lug projecting
 30 downwardly from the under surface of said horn
 and having its front surface substantially in
 alignment with the rear wall of said slot.

10. As an article of manufacture, a shuttle
 blank having therein a longitudinally extending
 cavity for the reception of a filling carrier, said
 shuttle blank being recessed in the usual manner
 to receive and hold a threading block in align-
 5 ment with said cavity, said shuttle blank being
 provided with a thread-guard-receiving channel
 formed in the outer end thereof in alignment
 with said cavity, there being a thread guiding
 slot forwardly of and substantially parallel to
 10 said channel, said slot being in alignment with
 said cavity and said recess and communicating
 directly with the latter.

11. As an article of manufacture, a shuttle
 blank having therein a longitudinally extending
 15 cavity for the reception of a filling carrier, said
 shuttle blank being recessed in the usual man-
 ner to receive and hold a threading block in
 alignment with said cavity, said shuttle blank
 being provided with a thread-guard-receiving
 20 channel formed in the outer end thereof in
 alignment with said cavity, there being a thread
 guiding slot formed in the said shuttle body and
 extending outwardly from the said recess sub-
 25 stantially parallel to the said channel, the slot
 and channel being separated by a wall which ex-
 tends outwardly from the outer end of said re-
 cess and serves as a thread trap for preventing
 the running filling from kinking rearwardly out
 30 of the said slot.

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