

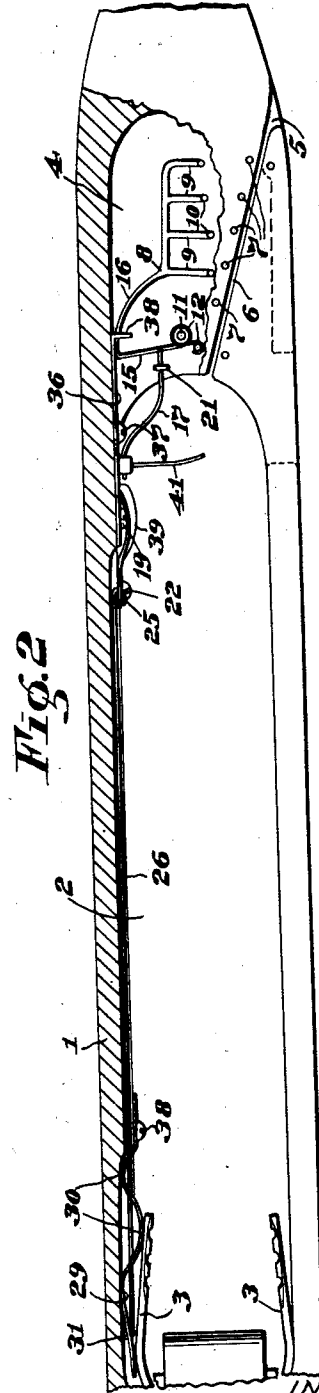
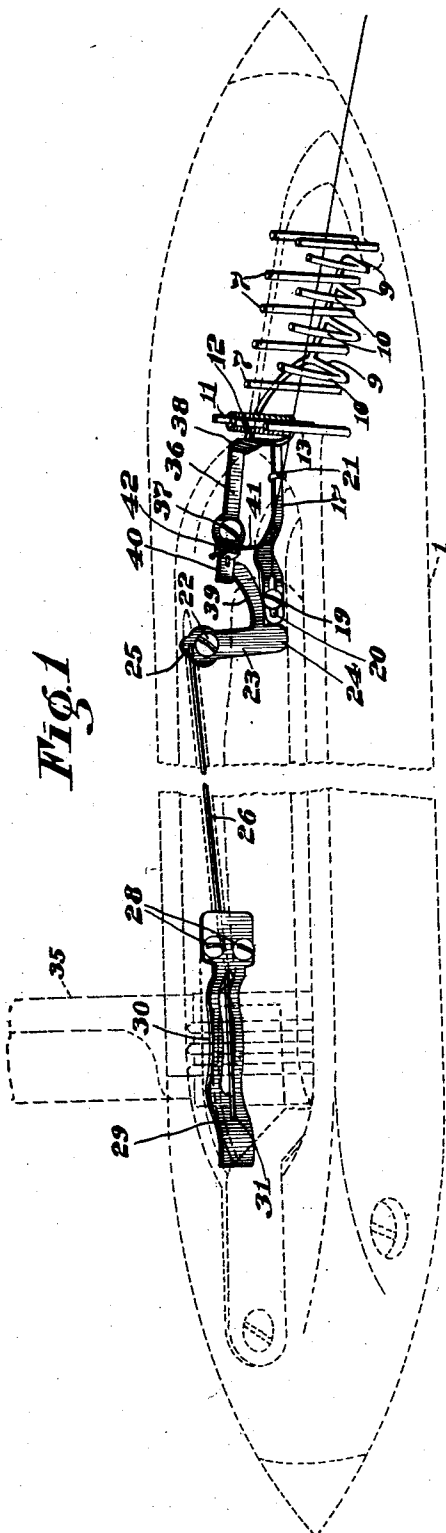
Dec. 15, 1931.

V. LINDSJO

1,837,166

AUTOMATICALLY THREADING LOOM SHUTTLE

Original Filed Feb. 10, 1930 2 Sheets-Sheet 1



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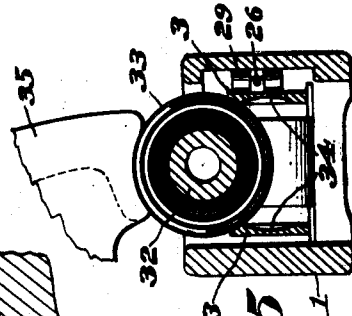
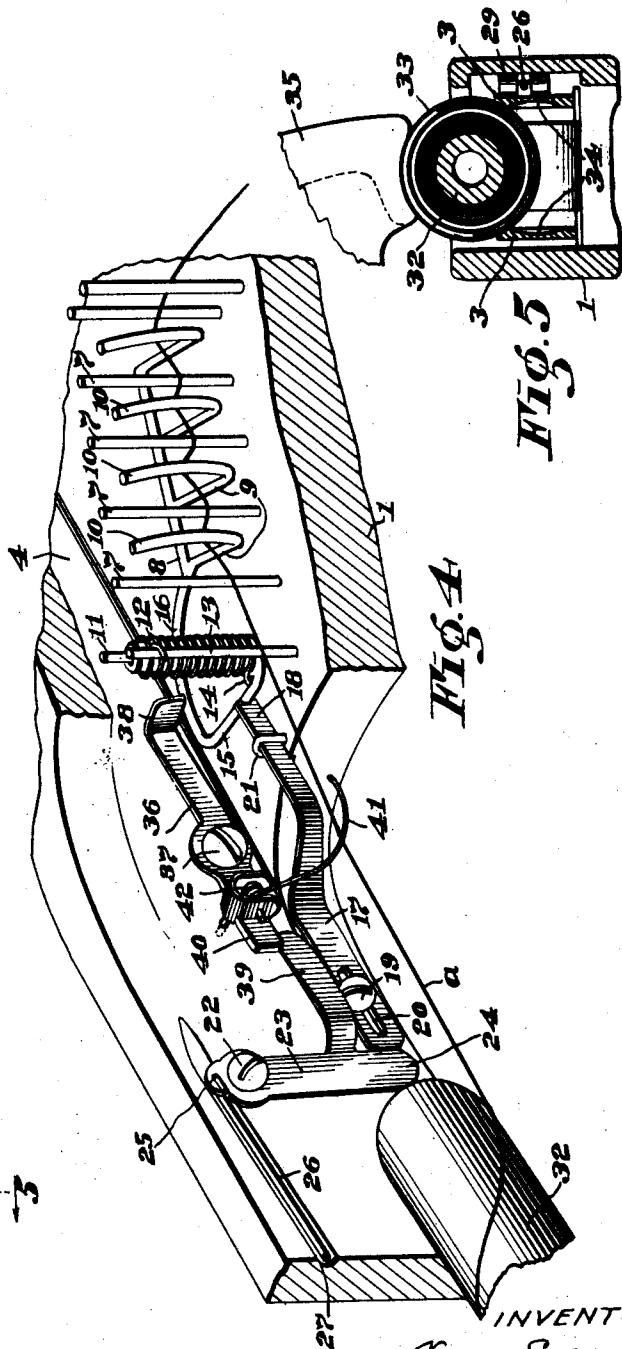
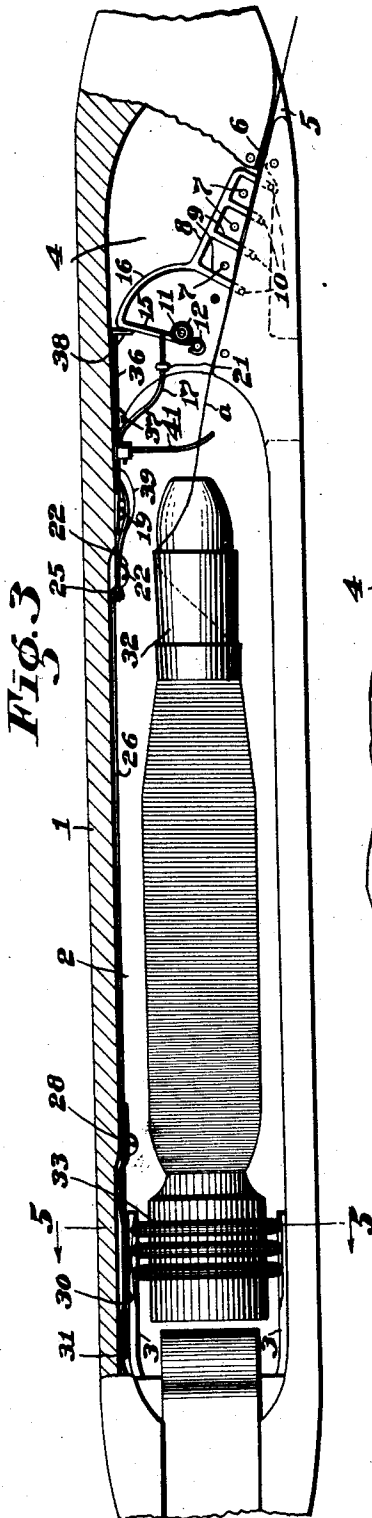
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2 Sheets-Sheet 2



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## UNITED STATES PATENT OFFICE

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## AUTOMATICALLY THREADING LOOM SHUTTLE

Application filed February 10, 1930, Serial No. 427,195. Renewed October 22, 1931.

This invention relates to automatically threading loom shuttles in which the filling is changed from time to time, and is more particularly directed to the thread tensioning means whereby the filling thread is uniformly tensioned during weaving.

In filling replenishing looms where the filling in the shuttle is replenished from time to time, it is desirable that the incoming filling thread shall have imparted thereto the same tension on the first pick of the shuttle following replenishment as exists during subsequent weaving, otherwise the cloth is liable to show defects which are particularly observable in weaving with certain kinds or characters of filling. A solution of this problem has heretofore been attempted with only a fair degree of satisfaction, owing to the character of the thread tensioning mechanism.

One of the important features of the present invention therefore consists in thread tensioning members mounted in the shuttle for movement to and from thread tensioning relation, so that on replenishment of filling such tensioning members shall be moved out of thread tensioning relation to free the outgoing filling end and to receive the incoming filling that it may be engaged by the tensioning members when they are again moved into thread tensioning relation on the first pick of the shuttle following replenishment; so that on the first pick of the shuttle following replenishment the thread will be subjected to the same tensioning effect as exists in subsequent weaving.

The invention and new features thereof will best be made clear from the following description and the accompanying drawings of one good, practical form thereof.

In the drawings:

Fig. 1 is a perspective view of an automatically threading shuttle, shown in dotted lines, and provided with the present invention, the features of which are shown in full lines;

Fig. 2 is a sectional plan view of a shuttle containing the present invention;

Fig. 3 is a view similar to that of Fig. 2 but showing a filling carrier as having been transferred to the shuttle and illustrating the

relation of the tensioning members before the shuttle is picked following replenishment;

Fig. 4 is an enlarged perspective view, with parts broken away, showing more particularly the features of the present invention with the tensioning members in thread tensioning relation; and

Fig. 5 is a section on the line 5—5 of Fig. 3.

The shuttle may be of any of the now well-known filling replenishing types wherein the shuttle becomes threaded automatically as the shuttle is picked, and, as shown in the present instance, the shuttle 1 has the usual bobbin chamber 2 and is provided with the bobbin holding jaws 3 whereby the filling carrier or bobbin may be detachably held in the shuttle. Forward of the bobbin chamber the shuttle is provided with a thread passage constituted, in the present instance of the invention, by a cavity 4 communicating with a side delivery eye 5, and extending downwardly into the cavity 4 the wood of the shuttle is formed with a threading slot 6 communicating with the side delivery eye 5, so that on the first pick of the shuttle following replenishment the thread will pass downwardly through the slot 6 into the cavity 4 and thereafter be delivered from the side delivery eye. These features as thus far described may be of usual construction with the object of effecting an automatic threading of the shuttle when replenishment has been effected and the shuttle is picked.

Mounted in the cavity 4 of the shuttle are the thread tensioning members which are relatively movable into and out of thread tensioning relation and such thread tensioning members may be variously contrived, but in the present instance of the invention one of the tensioning members consists of a series of pins 7 shown as vertically arranged between the top and bottom walls of the cavity 4 and at one side of the opening or slot 6. The coacting tensioning member is shown in the present instance of the invention as movable relatively to the companion tensioning member and comprises an arm 8 having a series of laterally extending fingers 9 provided with upwardly extending portions 10

arranged in staggered relation with the co-acting tensioning member. The arm 8 is mounted for swinging movement on a pin 11 secured to the shuttle and is normally under  
 5 the influence of a spring 12 tending to move the arm 8 laterally away from the pins or tensioning member 7. As shown, the spring 12 has one end thereof secured to a post 13 fixed to the shuttle and its other end at 14  
 10 bearing against a projection 15 preferably formed as part of the arm 8, the result being that when the spring 12 is at liberty to act upon the arm 8 the movable tensioning member will be moved laterally relative to the co-acting tensioning member into thread tensioning relation therewith. In the present instance the arm 8 is connected to the projection 15 by the curved portion 16 which passes about the pin 11, as more clearly indicated  
 20 in Figs. 2 and 4.

Mounted for longitudinal movement at one side of the bobbin chamber is a separator 17, the front end portion 18 of which bears upon the projection 15 at one side of the pivotal  
 25 mounting of the arm 8. In order to guide the separator for longitudinal movement, a pin or bolt 19 passes through a slot 20 formed in the separator, and the forward end of the separator is embraced by a guide 21, the construction being such that should the separator  
 30 be moved forwardly it will act upon the projection 15 and move the arm 8 with its attached parts into non-tensioning relation with respect to the co-acting tensioning member or pins 7, as indicated in Fig. 3.

Pivotaly mounted at one side of the bobbin chamber at 22 is an actuator 23, the lower end portion 24 of which bears upon the end of the separator 17, and connected to the  
 40 actuator 23 above its pivotal mounting, as at 25, is a rod 26 which extends longitudinally of the shuttle at one side of the bobbin chamber and preferably in a recess 27 formed in the wall of the shuttle, the construction being such that should the rod 26 be moved  
 45 backward or to the left, as shown in the drawings, the actuator 23 will be turned upon its pivotal mounting to thereby move the separator 17 forwardly and turn the movable tensioning member into non-tensioning relation  
 50 with the co-acting tensioning member.

Secured to the wall of the shuttle at 28 at a point adjacent the bobbin holding jaws is a resilient member 29 provided with a bend 30  
 55 which bears upon the adjacent bobbin holding jaw, and the rod 26 is secured to the resilient member 29 at 31.

Referring to Fig. 2 it will be noted that the bobbin holding jaws 3 project inwardly  
 60 to some extent from the side wall of the bobbin chamber, and when a bobbin, such as 32, is transferred to the shuttle, the bobbin holding rings 33 will cause the bobbin holding jaws to spring outwardly as the bobbin passes  
 65 downwardly into the shuttle and contacts

with the top portion of the bobbin holding jaws, as indicated in Fig. 5. The bobbin holding jaws 3 are each supplied with ring holding recesses 34 which engage the bobbin holding rings 33 when the bobbin has been  
 70 fully positioned in the shuttle. As the bobbin rings 33 pass downwardly under the impulse of the transferer 35, as usual, the bobbin holding jaws will be separated until the rings engage the recesses 34, when they will spring  
 75 inwardly to some extent by reason of the grooves 34, the result being that as the bobbin passes downwardly in the position shown in Fig. 5, the bobbin holding jaws will be sprung outwardly, thereby acting upon the bend 30  
 80 of the resilient member 29 and cause its elongation towards the end of the shuttle opposite the tensioning members. Such elongation of the resilient member 29 will draw upon the rod 26, thereby turning the  
 85 actuator 23 and effecting longitudinal movement of the separator 17 to effect movement of the tensioning members out of thread tensioning position, and thus free the outgoing filling end and permit the incoming  
 90 filling to be positioned for engagement by the co-acting tensioning members when the latter are again moved to thread tensioning position.

When the bobbin 32 has been fully transferred to the shuttle, the bobbin holding jaws 3 will move inward to some extent owing to the bobbin holding grooves therein, thereby causing the rod 26 to move forwardly or towards the threading end of the shuttle, and  
 100 consequently the actuator 23 will be swung to permit the separator 17 to move backwardly. It is desirable at this time to prevent the tensioning members from moving to thread tensioning position, and for this purpose a lock  
 105 is provided.

In the present instance of the invention, the lock consists of an arm 36 pivotaly mounted in the shuttle at 37 and having a turned end portion 38 adapted to engage behind the projection 15 of the arm 8 when the latter has  
 110 been moved into non-tensioning position, as indicated in Fig. 3. Movement of the lock into its locking position is effected by a finger 39 projecting from the actuator 23, which is adapted to engage the end 40 of the lock when the actuator 23 is swung upon its pivotal  
 115 mounting to move the separator 17 forwardly and perforce turn the arm 8 into non-thread-tensioning position, as indicated in Fig. 3.

This relative position of parts will be maintained by the lock after the fresh filling carrier or bobbin has been inserted in the shuttle, so that the incoming thread *a* may pass into position for engagement by the tensioning  
 120 members when they are again relatively moved to thread tensioning position.

The present invention contemplates that the lock be tripped by the incoming filling as the shuttle is picked from the replenishing box,  
 125

to thereby permit the tensioning members to move into tensioning position and apply tension to the incoming thread. In the present instance of the invention this is effected by an arm or bail 41 which is secured to the lock 36 at 42 and the bail 41 extends laterally of the bobbin chamber in position to be engaged by the incoming thread *a* when replenishment has been effected. When the shuttle is picked from the replenishing shuttle box the swirling action of the thread *a* acting upon the bail 41, trips the lock, thereby freeing the tensioning members for relative movement into thread tensioning position, the thread at such time passing back and forth between the tensioning members, so that on the first pick of the shuttle following replenishment the incoming thread is given the same tension that exists during subsequent weaving. The bail 41 may be secured to the lock 36 in any approved manner, but, as indicated in the present instance of the invention, it is constituted as a spring arm which after tripping the lock remains out of active position.

From the construction described as one good practical embodiment of the present invention, it will be apparent that when filling replenishment is effected, the tensioning members will be moved out of thread tensioning relation and held in such position by the lock until the shuttle is picked from the replenishing shuttle box, whereupon the incoming thread *a* will act upon the bail 41, trip the lock as the thread unwinds from the bobbin and permit the tensioning members to again move into thread-tensioning relation.

It is apparent that the thread tensioning members may be variously contrived but the form thereof as indicated constitutes a good practical embodiment of the tensioning members, and applicant believes himself to be the first in the art to cause the tensioning members to be moved out of thread tensioning relation by the action of the bobbin jaws as replenishment is effected, and it is believed that applicant is likewise the first in the art to provide a lock for the tensioning members to maintain them out of thread tensioning relation until after the incoming thread has been positioned for engagement by the tensioning members before the shuttle is picked, and thereupon cause the lock to be tripped by the action of the new filling as it unwinds from the filling carrier or bobbin.

What is claimed is:

1. An automatically threading loom shuttle having a bobbin chamber and side delivery eye, coacting thread tensioning members to exert tension on the thread and mounted for relative movement into and out of the thread tensioning position, means actuated on replenishment of filling for moving the tensioning members relatively out of thread tensioning position to permit the incoming

thread to be positioned for engagement by the tensioning members when they are again moved relatively into thread tensioning position, a lock for holding the tensioning members out of thread tensioning relation when moved to such relation on replenishment of filling, and means rendered effective by the incoming filling thread as the shuttle is picked to trip the lock and permit the tensioning members to be moved relatively into thread tensioning position.

2. An automatically threading loom shuttle having a bobbin chamber and side delivery eye, coacting thread tensioning members between the bobbin chamber and side delivery eye to exert tension on the thread and mounted for relative movement into and out of the thread tensioning position, means actuated on replenishment of filling for moving the tensioning members relatively out of thread tensioning position to permit the incoming thread to be positioned for engagement by the tensioning members when they are again moved relatively into thread tensioning position, a device for holding the tensioning members in their non-tensioning relation when they have been moved into such relation on replenishment of filling, and means rendered effective by the incoming filling thread as the shuttle is picked to cause the tensioning members to be moved relatively into thread tensioning position.

3. An automatically threading loom shuttle having bobbin holding jaws, coacting thread tensioning members to exert tension on the thread and mounted for relative movement into and out of thread tensioning relation, means mounted for movement in a direction lengthwise of the shuttle by the bobbin holding jaws on replenishment of filling for moving the tensioning members relatively out of thread tensioning relation to permit the incoming filling thread to be positioned for engagement by the tensioning members when they are moved into thread tensioning relation, and locking means for holding the tensioning members relatively out of thread tensioning relation until the shuttle is picked.

4. An automatically threading loom shuttle having a chamber for holding a yarn package, means for detachably holding the yarn package in said chamber that the shuttle may be replenished with filling, thread tensioning members to exert tension on the thread during weaving and mounted for relative movement into and out of thread tensioning relation, a device mounted on the shuttle for movement longitudinally thereof by the yarn package holding means on replenishment of filling for relatively moving the tensioning members out of thread tensioning relation, and a lock for holding the tensioning members out of tensioning rela-

tion until the shuttle is picked after being replenished.

5. An automatically threading loom shuttle having co-acting thread tensioning members to exert tension on the thread and mounted for relative movement into and out of thread tensioning relation, means for moving the thread tensioning members out of thread tensioning relation on replenishment of filling to free the outgoing thread and permit the incoming thread to be positioned for engagement by the tensioning members when they are moved into thread tensioning relation, a lock for holding the tensioning members out of thread tensioning relation, and a trip for the lock actuated by the filling thread to free the tensioning members from the lock and permit them to move relatively into thread tensioning relation.

6. An automatically threading loom shuttle having a bobbin chamber and side delivery eye, co-acting thread tensioning members mounted for relative movement into and out of thread tensioning relation, means actuated on replenishment of filling to move relatively the tensioning members from thread tensioning relation to permit the incoming thread to be positioned for engagement by the tensioning members when they are again moved relatively into tensioning relation, and means rendered effective by the swirling thread as the shuttle is picked for relatively moving the tensioning members into thread tensioning relation.

7. An automatically threading loom shuttle having a bobbin chamber and bobbin holding jaws, co-acting thread tensioning members to exert tension on the thread and mounted for relative movement to and from thread tensioning relation, means actuated by movement of the bobbin holding jaws on replenishment of filling for relatively moving the tensioning members out of thread tensioning relation to free the outgoing thread and permit the incoming thread to be positioned between the tensioning members, a lock for holding the tensioning members relatively out of thread tensioning relation, and means actuated by the thread as it is withdrawn from the shuttle to free the tensioning members that they may move relatively into thread tensioning relation.

8. An automatically threading loom shuttle having co-acting thread tensioning members, yielding means normally acting to cause the tensioning members to exert tension on the thread during weaving, a separator actuated on replenishment of filling to separate the tensioning members in opposition to said normally acting yielding means to free the outgoing thread and permit the incoming thread to be positioned for the action of the tensioning members when they are again moved relatively into tensioning relation, means for holding the tensioning members

in separated relation, and a trip for said means actuated by the thread as it is withdrawn from the shuttle on the first pick following replenishment to permit the tensioning members to move relatively to thread tensioning relation.

9. An automatically threading loom shuttle having bobbin holding jaws, coacting thread tensioning members to exert tension on the thread and mounted for relative movement into and out of thread tensioning relation, means mounted for movement in a direction lengthwise of the shuttle and actuated by the butt of the empty bobbin on replenishment of filling for moving the tensioning members relatively out of thread tensioning relation to permit the incoming filling thread to be positioned for engagement by the tensioning members when they are moved into thread tensioning relation and locking means for holding the tensioning members relatively out of thread tensioning relation until the shuttle is picked.

In testimony whereof, I have signed my name to this specification.

VERNER LINDSJO.