ABSTRACT OF THE DISCLOSURE

A filling positioner for shuttleless looms comprising a controlled gripping member which is movable in timed relation to the weaving cycle from a position where it receives and holds the filling to a position where it releases said filling after presenting it to the element which inserts it into the sheds formed by warp threads.

Background of the invention

In shuttleless looms which utilize filling yarn that is furnished from an outside source and is not carried to and fro through the shed by the shuttle or carrier itself, it is common practice to insert each pick of filling by two reciprocating elements. That element which introduces the filling into the warp shed is known as the inserting carrier and that which receives or has transferred to it the introduced filling to be drawn through the remainder of the shed is known as the filling receiving or extending carrier.

The shuttleless loom to which the instant invention is applicable is of the single pick insertion type wherein the filling yarn extends through an eyelet in the rear wall of the inserting carrier and remains threaded therethrough during the performance of said carrier's intended function.

To form single picks the filling yarn must be clamped, held, then cut adjacent the shed after the inserting carrier is withdrawn. In preparation for the following pick the filling yarn must be positioned in such a manner as to be caught by a clamping element in the forward wall of the inserting carrier prior to the latter's entrance into the shed. The clamped yarn is then released and that portion extending between the front and rear walls of the inserting carrier is properly positioned for positive transfer to the extending carrier.

The filling positioner according to the instant invention provides a novel and positive means of picking up and holding the filling yarn after the inserting carrier is withdrawn. After the filling yarn has been cut, the held end is moved to a position for pick up by the clamping element in the front wall of the carrier and the end is then released from the positioner to be carried into the warp shed.

Summary of the invention

The loom filling positioner comprising the invention includes a pair of cam controlled link members which support a filling holder or gripper. The gripper consists of a pair of opposed gripping members with one thereof being movable by cam means and in timed relation to the weaving cycle, into and away from contact with the other.

As the inserting carrier is being withdrawn from the shed, the gripper is moving at an oblique angle to the horizontal toward the lay and immediately after the inserting carrier leaves the shed, said gripper arrives at a position slightly above the lay where it receives the filling between the then open gripping members. These members are then timed to close and hold the filling yarn which is then cut adjacent the selvage.

The link members and gripper in preparation for the following pick then reverse their direction of movement and carry the held end of filling yarn to an elevated position for pick up by the inserting carrier. At this point the gripping members are timed to open permitting the end of filling yarn to be carried into the shed.

Brief description of the drawing

FIG. 1 is a perspective view of a portion of a shuttleless loom showing the mechanism according to the invention applied thereto;

FIG. 2 is a view similar to that of FIG. 1 but showing the mechanism of the invention as viewed from the opposite side.

Description of the preferred embodiment

Now referring to FIGS. 1 and 2, enough of a shuttleless loom to which the invention has been applied is illustrated to serve as a basis for a detailed description thereof.

The loom has among its many parts a lay beam 10 which is supported for swinging movement adjacent its ends by beams 11 (one only shown in FIG. 1). A reed 12 is fixed to the lay and extending upwardly therefrom it cooperates with the warp threads 13 in the conventional manner. Harness frames 14 (one only shown in FIG. 1) having heddles 15 control the crossing of the warp threads and as the latter are formed into fabric 16 by insertion of the filling yarn 17, said fabric is held at its reeded width by temples 18. Only one temple 18 is shown in FIG. 1, but it should be understood that a similar temple is disposed at the opposite side of the loom.

The inserting carrier is identified by numeral 19 and being fixedly attached to a flexible tape 20, it is caused to enter and be withdrawn from the warp sheds by a mechanism and method much the same as that shown and described in U.S. Patents 2,604,123 and 2,888,956.

The usual breast beam 21 forms the upper and forward portion of the loom's framework and provides a means for supporting the loom filling positioner according to the invention which is generally indicated in FIGS. 1 and 2 by numeral 22.

The filling positioner includes a generally U-shaped support bracket 23 which assembles on a slotted base plate 24 the latter of which is fixed to the upper surface of the breast beam. The slotted portion 25 of the base plate provides a means for changing the location of the filling positioner, to compensate for a change in the reeded width of fabric. The support bracket is movable within the limits of the slot 25 and can be fixed in any desired position by means of bolts 26 (one only shown in FIG. 2). The leg portions of the support bracket extend generally upwardly and are identified by numerals 27 and 28.

Leg 28 is somewhat longer than leg 27 with the upper portion being arcuated and directed toward the back of the loom.

A semicircular support plate 29 having a rearwardly extending and integrally formed leg 30 is fixed to the inner side of leg 28 by means of bolts 31 and 32 and provides a means for supporting the gripping member plus the levers for actuating the same and will be more fully described hereinafter.

By means of bolts 33 and 34 a rearwardly extending bearing block 35 is fixed to leg 27 of the support bracket 23 and provides a means for journaling one end of a cam shaft 36. This cam shaft is horizontally disposed and extends through the arcuated opening formed by the semicircular support plate 29 and is further supported intermediate its ends for rotary movement by a bearing block 37 that is fixed to the inner side of a control housing 38. Only a portion of the control housing 38 is shown in FIGS. 1 and 2; however, the remaining portion extends to the right-hand side of the loom and includes a
A bevel gear 39 is fixed on cam shaft 36 within the control housing 38 and serves as a means for rotating said shaft in the direction of the indicating arrows 40. A similar bevel gear (not shown) is in driving relation with gear 39 and is fixed to a shaft (not shown) which extends generally downward to any suitable source of power for rotary motion such as the loom's main cam shaft 34.

An actuating lever 41 of arcuated configuration is pivotably attached at one end to the upper and outer side of the support plate 29 by means of a bolt 42 as at 43. Extending in a generally downward direction the lower end of the actuating lever is pivotally connected to a lower support link 44 by means of a bolt 45 (FIG. 1). This lower support link extends rearwardly toward the loom's lay and is further supported intermediate its ends by a stud member 46. Stud member 46 is fixed to the side of the support plate 29 adjacent its inner end and extends through an angularly disposed slot 47 in the support link, the sides of which form guides for controlling angular forward and rearward movement of said support link.

Support link 44 carries the filling gripping members which will be more fully described and is caused to slide rearwardly and then forwardly by cam controlled movement of the actuating lever 41. This actuating lever is provided intermediate its ends with a cam follower 48 which is adapted by means of a coil spring 49 to be held in contact with the outer peripheral surface of a rotatable cam 50 fixed on the cam shaft 36. Coil spring 49 is connected at one end to the lower end of the actuating lever 41 and at its opposite end to a spring anchor bracket 51 which is fixed to the lower side of leg 28 by means of a bolt 32. Rotation of cam 50 causes the lower end of the actuating lever to pivot to and fro as the support link is pushed inwardly toward the lay, it is lowered simultaneously by the sliding movement of the guiding sides of slot 47 and their contact with stud member 46. As the support link is pulled forwardly by the action of coil spring 49, said link is simultaneously raised by stud member 46.

Support link 44 is generally L-shaped and the lower innermost end thereof is provided with a fixed gripping member 52 which is attached thereto by means of a screw 53 and nut 54.

An upper support link 55 is disposed above and in close proximity with the lower support link 44 and is pivotally connected to the latter by means of a link bracket 56 (FIG. 1). Like the lower support link 44, the upper support link 55 includes an angularly disposed slot 57 which is in alignment with slot 47 and the sides thereof also form guides for controlling the angular forward and rearward movement of said upper support link with said lower support link.

A stud member 58 extends through slot 57 and serves as a guiding element for the upper support link 55. Stud member 58 is fixed to the inner end of a double armed lever 59 which is pivotally supported intermediate its ends to the inner side of the leg 30 of the support plate 29 by means of an eccentric stud 60.

The eccentric stud 60 serves as a means for adjustable setting one of the gripping members and also provides a means for the assembly of an overhrow stop bracket 62.

This stop bracket is positioned on the outer side of leg 30 (FIG. 1) and serves to prevent the possibility of excessive movement of the actuating lever 41 and the support links 44 and 45 controlled thereby.

By a means to be more fully described, lever 59 is caused to pivot in timed relation with the movement of the support links to pivot the inner end of the upper support link toward and away from the lower one.

The inner end of the upper support link 55 is provided with a depending gripping member 63 (FIG. 2) which is attached to said support link by screws 64. The lower end of this gripping member 63 is vertically movable into and out of contact with the fixed gripping member 52 and is maintained in alignment with the latter by means of a guide plate 65 (FIG. 2). The depending gripping member 63 is attached by a screw 66 to the forward upper side of the fixed gripping member 52.

A coil spring 67 is utilized for urging the gripping members into contact one with the other and as shown in FIG. 1 one end thereof is attached to the lower support link 44 and its opposite end to the upper support link 55.

The means for pivoting the upper support link to open and close the gripping members in timed relation with the rearward and forward movement of both the upper and lower support links will now be described.

The double armed lever 59 is provided on its forward end with a cam follower roller 68 (FIG. 2) which is adapted to maintain contact with the outer peripheral surface of a pair of juxtaposed cam members 69 and 70. These cam members are fixed on and caused to rotate with the cam shaft 36 and being in abutting relation the cam roller 68 is caused to respond to the dictates of first one cam and then the other. The roller 68 is continually urged into contact with the cam member 69 and 70 by means of a coil spring 71. The lower end of coil spring 71 attaches to lever 41. The upper end of said filling to the opposite side of the warp shed. During this movement the lay is moving toward front center attachment.
and the support links carrying the gripping members are moving in the direction of the lay and slightly downwardly to a position in close proximity with the upper surface thereof. After the inserting carrier has left the shed, the height of eyelet 82 is such as to hold the filling a sufficient distance above the top surface of the lay so as to be received by the notched portion 81 of the yarn positioner 80. This notched portion also holds the filling forwardly of the reed and as the lay continues forwardly the gripping members are separated to receive the running length of said filling. The gripping members are immediately closed to clamp and hold the filling, and the remaining forward movement of the lay causes the cutting blade 77 to enter slot 78 in the temple which severs the filling.

The gripping members are then holding the end of the filling which extends through the eyelet in the carrier and to its source of supply.

After beat-up the lay reverses its direction of movement and the gripping members with the held end of filling yarn are moved forwardly and slightly upwardly as heretofore described. As the carrier passes in front of the gripping members to introduce the next pick, the filling yarn is drawn across the interior of the carrier and is gripped within an open slot provided on the front wall of the latter. At this point the gripping members are separated to release the filling yarn and the inserting carrier carries the end of said filling into the shed for presentation to the filling extending carrier. Upon withdrawal of the inserting carrier this cycle is repeated on all subsequent picks.

While one embodiment of the invention has been disclosed, it is to be understood that the inventive concept may be carried out in a number of ways. This invention is, therefore, not to be limited to the precise details described, but is intended to embrace all variations and modifications thereof falling within the spirit of the invention and the scope of the claims.

We claim:

1. In a shuttleless loom of the single pick insertion type having an inserting and an extending carrier by means of which filling yarn from an outside, stationary source of supply is introduced into sheds formed by warp threads, the improvement which comprises a filling yarn gripper, said gripper including opposed upper and lower gripping members having means for moving at least one of said members toward and away from the other, a further means for advancing said gripper to a lowered position for receiving said filling and an additional means for withdrawing said gripper and filling to an elevated position for presentation of the filling to said inserting carrier.

2. The filling yarn gripper according to claim 1 wherein said gripping members are disposed one above the other and depend from the ends of upper and lower juxtaposed slidable support links individual thereto.

3. The filling yarn gripper according to claim 2 wherein said support links are pivotally supported at the ends opposite those which support said gripping members.

4. The filling yarn gripper according to claim 2 wherein said means includes a pair of rotating cams disposed in contiguous relation, a pivotable lever having one end thereof subject to the dictates of said cams and the other mechanically linked to one of said support links whereby said gripping members are open and closed in timed relation with the weaving cycle to receive, hold and then release said filling yarn.

5. The filling yarn gripper according to claim 2 wherein said support links are slidable in unison in a plane oblique to the horizontal on stud members cooperating with angularly disposed guides forming a part of each said support links.

6. The filling yarn gripper according to claim 3 wherein a link bracket pivotally supports one of said support links with said bracket being fixed to and disposed interposed intermediate the ends of the other of said support links.

7. The filling yarn gripper according to claim 2 wherein said further means includes a rotatable cam, an actuating lever pivotally supported at one of its ends, a follower forming a part of said actuating lever and disposed so as to respond to the dictates of said rotatable cam, the opposite end of said actuating lever being pivotally connected to said lower support link.

8. The filling yarn gripper according to claim 7 wherein said additional means includes a spring member for maintaining said follower in contact with said rotatable cam whereby said support links and gripping members carried thereby are advanced by said rotatable cam and withdrawn by said spring member.

9. The filling yarn gripper according to claim 1 wherein said upper gripping member is spring biased in the direction of the lower gripping member.

10. The filling yarn gripper according to claim 4 wherein said pivotable lever is supported on an eccentric stud thereby providing means for adjusting said one of said gripping members.

References Cited

UNITED STATES PATENTS

2,553,351 5/1951 Belotti 139—127
2,665,716 1/1954 Budyzenia et al. 139—127
3,269,426 8/1966 Llado 139—122
3,276,482 10/1966 Liebchen 139—122
3,276,483 10/1966 Golobart 139—122

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