ABSTRACT OF THE DISCLOSURE

This invention relates to a clamping apparatus, and more particularly to a transfer tail clamping apparatus for use in combination with a bobbin replenishing mechanism for engaging the end of a transfer tail of a bobbin and the like, when said bobbin is being transferred.

During a cloth weaving operation when a bobbin is inserted in a shuttle on a loom it is necessary to hold the end of the transfer tail of the yarn carried by the bobbin during the maiden voyage or first pick of the shuttle. Normally, on automatic bobbin winding mechanisms associated with looms the end of the transfer tail is held by a clamping mechanism during this first pick. One of the problems encountered in clamping mechanisms, hereinafter used, was the jaws of the clamp occasionally bounced apart slightly when the clamp was closed. When the clamping mechanism bounced the transfer tail was occasionally dropped and as a result the loom was shut down automatically. Thus, it can be seen that it is extremely important that the clamping mechanism positively grip and hold the transfer tail each and every time during the bobbin transfer operation.

One clamping mechanism, hereinafter utilized is illustrated in FIGURES 7, 9, 20 and 21 of Patent No. 2,638,936 granted to Goodhue et al., and issued on May 19, 1953. An improved model of the device illustrated in the patent is manufactured by Leesona Corporation, and is generally referred to as the Unifill Loom Winder having a Model No. 791.

Accordingly, it is an important object of the present invention to provide an improved yarn clamp for holding the transfer tail of a bobbin when a bobbin is being transferred.

Another important object of the present invention is to provide an improved yarn clamp which minimizes bumping when such is closed to positively engage and hold the transfer tail of a bobbin during transfer.

Still another important object of the present invention is to provide a yarn clamp mechanism which catches the transfer tail of a bobbin sooner and holds such longer than clamping apparatus heretofore utilized.

The invention will be more readily understood from a reading of the following specification and by reference to the accompanying drawings forming a part thereof, wherein an example of the invention is shown and wherein:

FIGURE 1 is a front perspective view of a portion of an automatic loom winder illustrating the clamping mechanism.

FIGURE 2 is a side elevational view of a yarn clamp constructed in accordance with the present invention illustrated in an open position and the mechanism for actuating such, and

FIGURE 3 is a side elevational view of the yarn clamping mechanism illustrated in a closed position.

The drawing illustrates a transfer tail clamping apparatus for use with a bobbin replenishing mechanism for engaging the transfer tail of a bobbin and the like, when the bobbin is being transferred. The bobbin replenishing mechanism has an abutment A carried thereon adjacent the normal path of the transfer tail of the bobbin. A movable frame B is carried by the bobbin replenishing mechanism. Means C is provided for shifting the movable frame to a forward position when the bobbin is being transferred. A clamping member is carried opposite the abutment A. The movable frame B has a connection for providing relative movement between the abutment A and the clamping member for engaging and holding the transfer tail between the abutment A and the clamping member when the frame is shifted to the forward position. The clamping member includes a first supporting member D and a second supporting member E positioned in spaced aligned relation to the first supporting member D. A positioning member F is carried adjacent each thereof, by the first and second supporting members D and E, respectively. At least one of the ends of the positioning member F is slidable by its respective supporting member. A spring G is carried by the positioning member F between the first and second supporting members D and E. A spring G is compressor when the bumper engages the abutment for producing a positive engagement of the transfer tail between the bumper and the abutment.

In the particular embodiment illustrated, the transfer tail clamping apparatus is being used with a Unifill Model No. 791 Loom Winder, which is manufactured by Leesona Corporation of Warwick, R.I. The loom winder automatically winds yarn on bobbins and maintains a supply of full bobbins which are automatically transferred to the shuttle on the loom as the filling in the running shuttle is nearly exhausted. Each of the bobbins waiting to be transferred to the shuttle has a transfer tail 10, the end of which is held by a gripping mechanism carried by a tensioning drum 11. Only the transfer tail of the member most bobbin carried in the bobbin magazine is illustrated in FIGURE 1. When the bobbin is transferred to the shuttle it is necessary that the end of the transfer tail be held stationary so that it can be threaded in the eye of the shuttle. It is, also, necessary that the transfer tail be held stationary during the first pick of the tail. This is the purpose of the clamping apparatus generally referred to by reference numeral 12 constructed in accordance with the present invention.

An abutment A is carried on the frame 13 of the bobbin replenishing mechanism for cooperating with the clamping apparatus to hold the transfer tail of the bobbin therebetween. The abutment A has a horizontal leg 14 which terminates in a vertical leg 15 upon which a bumper 16 is carried. The horizontal leg 14 is secured to the frame 13 of the bobbin replenishing mechanism by any suitable means, such as screws or brads. The bumper is constructed of a hard rubber material, and has an opening therein permitting such to slip over the vertical leg 15 and fit snugly thereon. The front surface of the bumper 16 is corrugated so as to cooperate with a complementary surface on the clamping mechanism. It is noted that the abutment A, as well as the complementary surface on the clamping mechanism, tilts slightly backwards for accommodating the transfer tail.

A movable frame B is carried by the bobbin replenishing mechanism and such is shifted to the right in order to close the clamping member which is attached to its outer end. A vertical leg 17 is integral with the outer end of the movable frame B and has two vertically spaced apertures therein for receiving bolts 18 or the like, for
attaching the clamping member thereto. The movable frame has a flat main body portion 19 with a pair of spaced vertical posts 20 and 26, respectively, adjacent the inner end. The vertical posts have horizontal apertures therein for receiving a horizontal rod 21 upon which the frame slides during opening and closing of the clamping apparatus. The horizontal rod 21 has its ends suitably secured to the casing of the bobbin-replenishing mechanism. The movable frame 13 has laterally spaced side walls 22 and 23, respectively, integral therewith. A laterally extending rod 24 is carried between the side walls 22 and 23 for accommodating apparatus utilized in shifting the frame. Such is discussed in more detail below.

The jaws of the clamp are open when the slack end of the yarn is drawn thereinto prior to the bobbin being transferred into the shuttle. The clamping apparatus is held in the open position by a locking mechanism and the bobbin-replenishing mechanism is provided with means C for shifting the movable frame B to a forward position when the bobbin is being transferred. The locking or cocking mechanism comprises a lever 25 which is freely carried on a rockable rod 26. A laterally extending pin 27 is carried in the medial portion of the lever 25 and engages a notch 28 in a lattice lever 29 pivoted on a stud 30. The end of the lever 25 is bifurcated for accommodating the lateral rod 24 carried on the movable frame 13. The lever also has a guideway member 31 pivotally carried on its side which extends over a vertically extending portion of the side wall 23 carried by the movable frame B. A rearwardly extending arm 32 is integral with the top of the lever 25 and has a notch 33 therein for receiving one end of a spring 34. The other end of the spring 34 is suitably secured to a stud 35 extending inwardly from the casing of the bobbin-replenishing mechanism. Another spring 36 is carried between the end of the lattice lever 29 and a stud 37 which is located adjacent the top of the bobbin-replenishing mechanism. A rearwardly extending arm 38 is fixed to the rockable rod 26 for rotation therewith. A linking member 39 has one end pivotally connected to the arm 38 and the other end pivotally connected to the end of the lattice lever 29. The rockable rod 26 is connected to be rocked by the transfer hammer (not shown) associated with the bobbin-replenishing mechanism and is rotated in a clockwise direction when a bobbin is being transferred. Such causes the lattice lever 29 to be depressed by means of the linking member 39 and the arm 38. When the lattice lever is depressed the pin 27 is allowed to escape from the notch 28 and the spring 34 causes the lever 25 to be pivoted in a counterclockwise direction. When the lever is rotated in a counterclockwise direction the jaws of the clamping apparatus are closed from the open position illustrated in FIGURE 2 to the closed position illustrated in FIGURE 3. During the unlatching operation the pin 27 rides up on the upper surface of the lattice lever 29 against the tension in the spring 36. It is also noted that during the unlatching operation the movable frame slides forwardly on the rod 21 from the position illustrated in FIGURE 2 to that of FIGURE 3. The above-mentioned action takes place as a bobbin is being transferred into the shuttle of the loom.

In order to restore the clamping apparatus to its open position a finger 40 is pivotally carried on the laterally extending rod 24. A small spring 41 is connected between the body of the finger 40 and a lower portion of the lattice lever 29. When the lattice lever is in the position illustrated in FIGURE 2 the finger 40 causes the finger 40 to be pivoted upwards out of the path of a bunter 42 carried on the lay 43 of the loom. When the lattice lever 29 is in the position illustrated in FIGURE 3 the spring 41 causes the rearward end of the finger 40 to be pivoted downwards into the path of the bunter carried on the lay 43. When the lay moves forwardly on the next stroke the bunter 42 will engage the finger 40 causing the movable frame B to slide to the left, which in turn, causes the lever 25 to be pivoted in a clockwise direction until the pin 27 carried thereon is locked in the notch 28 carried on the lattice lever 29.

The above-mentioned latching and unlatching mechanism forms no part of the present invention, and is standard mechanism in the above-mentioned Unifil Loom Winder.

Hence, the clamping apparatus normally carried on the movable frame B is carried on the movable frame B. The above-mentioned latching and unlatching mechanism forms no part of the present invention, and is standard mechanism in the above-mentioned Unifil Loom Winder.

The above-mentioned latching and unlatching mechanism forms no part of the present invention, and is standard mechanism in the above-mentioned Unifil Loom Winder.

The clamping member constructed in accordance with the present invention is carried on the movable frame B opposite the abutment A. The clamping member includes a first supporting member D which is attached by means of a vertical leg 44 to the vertical leg 17 carried on the movable frame. Such attachment may be made by any suitable means such as bolts 18. Displaced laterally from the vertical leg 44 is an enlarged vertical supporting member 45 which is connected to the vertical leg 44 by means of a horizontal member 46. The supporting member 45 has two vertically spaced apertures therein for receiving the positioning member E.

The positioning member E includes a pair of rods 47 and 48, which extend through the apertures in the supporting member and are slidably carried by such. Enlarged heads 48(a) are carried on the rods for restricting the movement of the rods in a forward direction. The other end of the rods 47 and 48 are reduced and have threads thereon for receiving nuts 50 for securing the second supporting member E in spaced aligned relation to the first supporting member D, and providing a fixed connection between the rods and the second supporting member E. A second supporting member E is U-shaped and has a pair of vertically spaced apertures in one leg for accommodating the reduced ends of the rods 47 and 48, respectively. A spring G is carried on each of the rods 47 and 48 and is interposed between the vertical supporting member 45 and the second supporting member E normally urging the supporting members E and E apart.

A bumper H is carried on the other leg of the U-shaped second supporting member and has a corrugated front surface which is the complement of the bumper carried on the abutment A. The bumper is constructed of a resilient rubber material, and takes the configuration of a sleeve. Such is slipped onto the outer leg of the U-shaped second supporting member E and fits snugly therein.

In operation when a fresh bobbin is being transferred to a shuttle on the loom the rod 26 is rocked by the transfer hammer depressing the lattice lever 29. Such permits the spring 44 to rotate the lever 25 in a counterclockwise direction sliding the movable frame to the right for closing the jaws of the clamping apparatus when the bumper H carried on the second supporting member E strikes the bumper 16 carried on the abutment A the springs G are compressed as the rods 47 and 48 slide through the apertures in the vertical supporting member 45. Such compression of the springs G and slight movement of the engaging bumper H produces a positive engagement of the transfer tail between the bumper H carried on the second supporting member and the bumper 16 carried on the abutment A. The compression of the springs minimizes bouncing when the jaws of the clamping mechanism are closed, providing an extremely reliable transfer tail for the clamping apparatus. Since the clamping apparatus is capable of being compressed, such catches the transfer tail
sooner than conventional clamps and holds the transfer tail longer during the bobbin transfer operation.

While a preferred embodiment of the invention has been described using specific terms, such description is for illustrative purposes only, and it is to be understood that changes and variations may be made without departing from the spirit or scope of the following claims.

What is claimed is:

1. A transfer tail clamping apparatus for use with a bobbin replenishing mechanism for engaging a transfer tail of a bobbin and the like wherein when said bobbin is being transferred, said bobbin replenishing mechanism having, an abutment carried in a fixed position thereon adjacent the transfer tail of said bobbin, a movable frame carried by said bobbin replenishing mechanism, and means for shifting said movable frame to a forward position when said bobbin is being transferred, the improvement including: a clamping member carried by said movable frame opposite said abutment, said movable frame having connection for moving said clamping member into engagement with said abutment for engaging and holding said transfer tail between said abutment and said clamping member when said frame is shifted to said forward position, said abutment being inclined rearwardly for accommodating said transfer tail, said clamping member including a first supporting member, a second supporting member positioned in spaced aligned relation to said first supporting member, a positioning member carried adjacent each end thereof by said first and second supporting members respectively, at least one of said ends being slidably carried by its respective supporting member, a spring carried by said positioning member between said first and second supporting member normally urging said supporting members apart, and a bumper carried on said second supporting member for clamping the transfer tail against said abutment when said bobbin is being transferred, said second supporting member being inclined rearwardly causing said bumper to fit flush against said abutment when in engagement, whereby said spring is compressed when said bumper engages said abutment for producing a positive engagement of the transfer tail between said bumper and said abutment.

2. The transfer tail clamping apparatus as set forth in claim 1 wherein said positioning member includes a pair of spaced guide rods, and said spring includes a pair of springs, one on each of said rods.

3. The transfer tail clamping apparatus as set forth in claim 1 wherein said bumper and said abutment have a flat corrugated contacting surface thereon for engaging the transfer tail when said clamping member is shifted to the forward position.

References Cited

UNITED STATES PATENTS

2,522,290 9/1950 Mabry
2,638,936 5/1953 Goodhue et al.
2,766,779 10/1956 Goodhue et al.
3,194,278 7/1965 Grob

OTHER REFERENCES


MERVIN STEIN, Primary Examiner.
JAMES KEE CHI, Assistant Examiner.