Nov. 11, 1952 E. A. KIESSLING ET AL 2,617,447

WARP BEAM MOUNT

Filed Sept. 23, 1948 2 SHEETS—SHEET 1

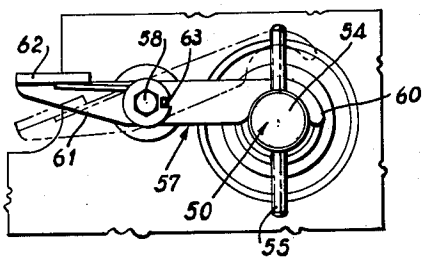


Fig. 3

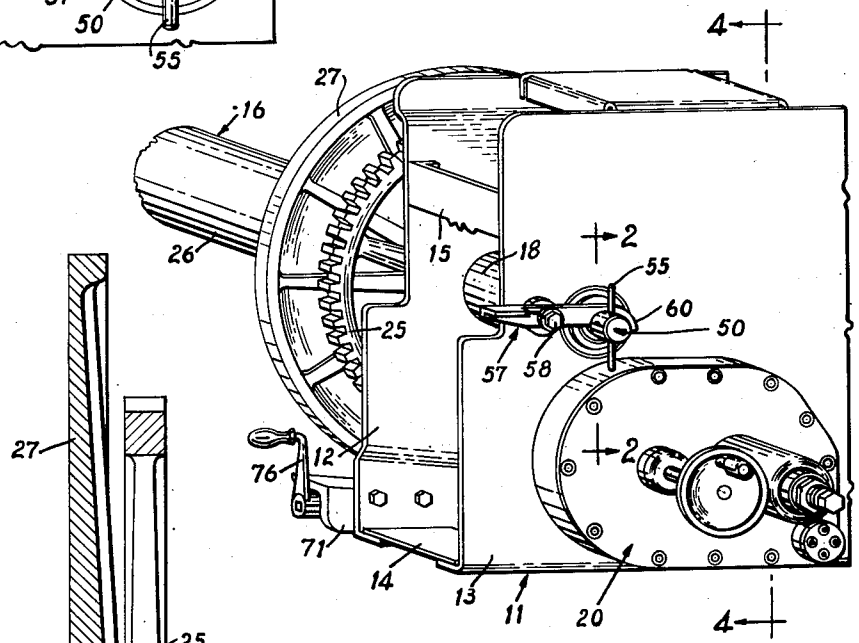


Fig. 1

Fig. 2

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WARP BEAM MOUNT

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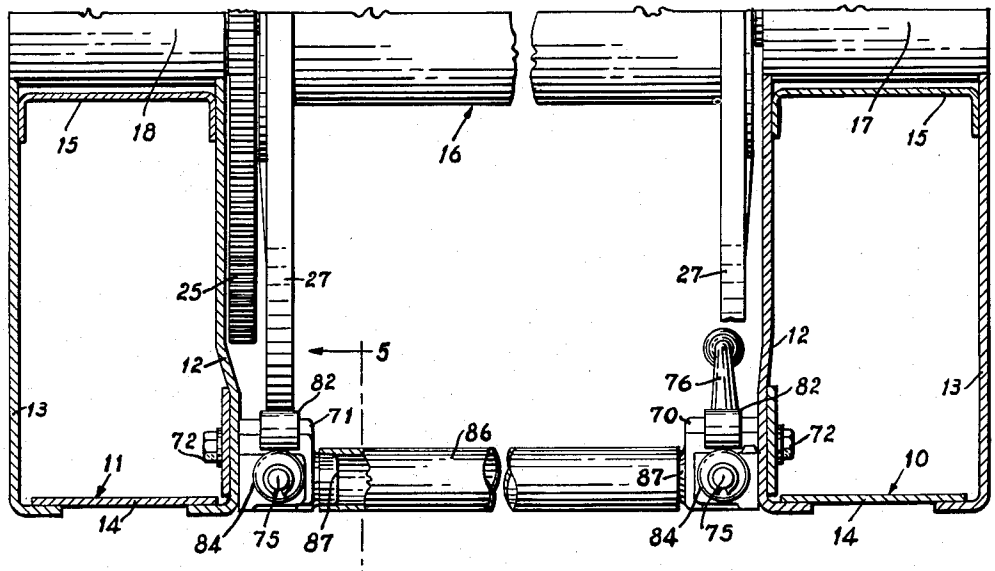


Fig. 4

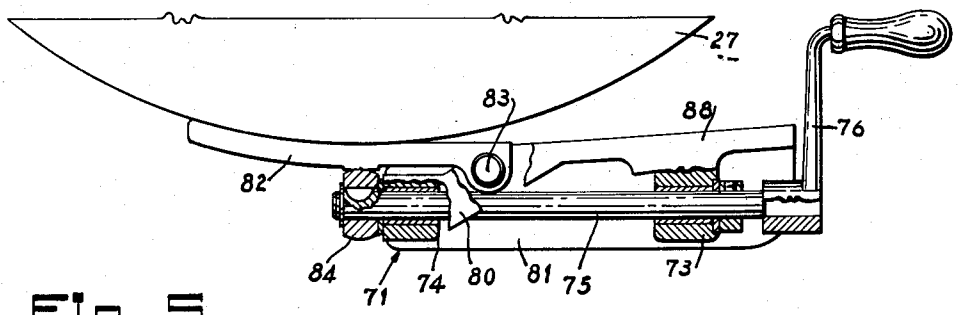


Fig. 5

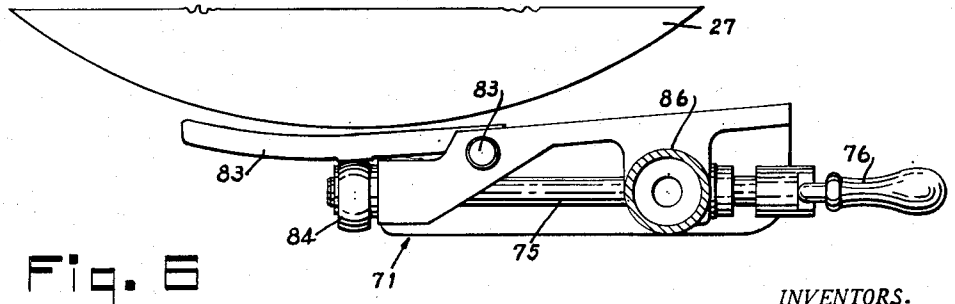


Fig. 6

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Patented Nov. 11, 1952 2,617,447

UNITED STATES PATENT OFFICE

2,617,447

WARP BEAM MOUNT

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Application September 23, 1948, Serial No. 50,834

5 Claims. (Cl. 139—97)

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The present invention relates to improvements in warp beam mounts and to the means for moving the warp beam towards and away from axial alignment with its bearings.

The conventional loom has near its rear end a warp beam on which the warp threads are wound. The warp sheet from this beam is trained over a whip roll and is then extended forwardly through various weaving instrumentalities. A let-off mechanism is provided to regulate the amount of feed of the warp from the beam. In one type of conventional loom, the let-off mechanism comprises a large beam head gear meshing with a let-off pinion and mounted rigid with one of the gudgeons of the warp beam, so as to form a unit with the warp beam, during the process of removing an empty warp beam from the loom and replacing it by a full warp beam.

The warp beam, whether it is empty or full, is bulky and heavy and is, therefore, hard to manipulate in and out of operative supported position on the loom. The unitary attachment of the large heavy beam head gear to the warp beam renders the unit more difficult to manipulate in and out of operative position and also introduces the complication of requiring said beam head gear to be moved in and out of mesh with the let-off pinion in the process of moving the warp beam in or out of mounted position.

One object of the present invention is to provide a new and improved beam mount which is easily manipulatable to permit the warp beam to be easily moved into and out of mounted operative position.

Another object is to provide a new and improved warp beam mount which is easily manipulatable to release the warp beam from its bearing support and which is constructed so that the beam head gear does not form a removable unit with the warp beam, but is retained in mounted operative position, while the warp beam is manipulated in and out of mounted operative position.

A further object of the present invention is to provide new and improved means by which the warp beam may be moved into or out of operative mounted position.

Various other objects of the invention will be apparent from the following particular description and from inspection of the accompanying drawings in which:

Fig. 1 is a fragmentary perspective of the warp beam mount and lifting mechanism embodying the present invention;

Fig. 2 is a detail section of one of the warp beam mounts taken approximately along lines 2—2 of Fig. 1 but shown on a larger scale;

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Fig. 3 is a side elevation of the warp beam mount shown in Fig. 2;

Fig. 4 is a transverse rear section of the loom taken approximately along the lines 4—4 of Fig. 1 and shows the warp beam empty but in mounted operative position before it has been removed from the loom and the lifting mechanism prepared to remove the empty warp beam;

Fig. 5 is a detail section of the warp beam lifting mechanism taken approximately along the lines 5—5 of Fig. 4 and shows said lifting mechanism in raised position to lower the empty warp beam from the loom; and

Fig. 6 is a view similar to Fig. 5 but shows the warp beam in running mounted position and the lifting mechanism in lowered inoperative position.

Referring to the drawings, the loom is provided with a right loomside 10 and a left loomside 11 serving as the main frame structure of the loom. Each of these loomsides is shown comprising an inner web 12 and an outer web 13 interconnected by a floor plate 14 and cross-braces 15, so that the webs on each loomside form a strong rigid unit and may be of the general type shown and described in copending application Serial No. 691,237 filed August 17, 1946, now Patent No. 2,533,128. Extending between the loomsides 10 and 11 is a warp beam 16 supported by bearing mounts 17 and 18 each secured between the webs of a corresponding loomside in a manner to be more fully described. The warp sheet unwinds from the warp beam 16, passes over a whip roll (not shown) and then extends forwardly to various weaving instrumentalities (not shown). The rate of advance of this warp sheet is controlled by a let-off motion such as that indicated generally at 20 and shown mounted on the left loomside 11. The let-off motion is employed to control warp feed, so as to allow the necessary amount of yarn to be unwound from the warp beam and to maintain said yarn under proper tension during the weaving cycle. As far as certain aspects of the invention are concerned, the let-off motion may be of any suitable type known in the art. The let-off motion shown has an input shaft (not shown) driven from the warp beam 16 through a beam head gear 25 which is secured to the beam shaft as will be described and which meshes with a let-off pinion (not shown) keyed to said input shaft.

The warp beam 16 comprises a cylindrical beam barrel 26 and a pair of beam heads or flanges 27 integral or otherwise rigidly secured to said beam barrel. For supporting the warp beam 16 in position for let-off rotation, there are provided the bearing mounts 17 and 18 which are similar in

construction except that the mount 18 is adapted to support the beam head gear 25, as will be more fully described. The details of the bearing mount 18 alone are shown but it must be understood that the other bearing mount 17 is of similar construction except as otherwise noted.

The bearing mount 18 comprises a cylindrical tubular bearing housing 30 having ends 31 and 32 of reduced diameter fitted snugly into corresponding holes in the loomside webs 12 and 13 respectively and preferably welded in position therein, so that said housing forms a rigid, inseparable unit with said loomside webs. The beam head gear 25 is provided with a hub 34 integral, or otherwise rigid, with the gear body and connected to one end of a sleeve journal 35. The journal 35 fits into and is keyed to the gear hub 34 and extends axially through the housing 30. The gear hub 34 has an axial projecting section 36 extending into one end of the housing 30 with a snug rotative fit and is provided with a series of circumferential slots 37 for sealing and lubricating purposes.

The journal 35 is supported for rotation in the housing 30 by means of anti-friction bearings 38 and 39 which are held in recesses formed at the ends of the housing 30 by enlargements of its internal bore at said ends and which are retained against axially facing annular shoulders formed by these recesses. The anti-friction bearing unit 38 is held in position against its limiting shoulder by means of the gear hub 34, while the anti-friction bearing unit 39 is held against its limiting shoulder by a collar 40 embracing the journal 35. The collar 40 is keyed to the journal 35 for rotation therewith, is provided with a series of peripheral slots 43 for sealing and lubrication purposes and is held in position against axial displacement with respect to said journal by means of a lock nut 41 threaded onto the outer end of said journal.

For supporting the warp beam 16 in operative position on the loom and for effecting a drive connection between said warp beam and the beam head gear 25, there is provided a gudgeon 50 extending through the journal 35 and through the hub 51 of the warp beam 16. This gudgeon 50 is of the multiple spline type and has a spline connection not only with the journal 35, but also with the hub 51 of the warp beam 16, so that there is provided a spline drive connection between the warp beam 16 and the beam head gear 25 through the splined gudgeon 50.

The gudgeon 50 is axially movable, so that it can be withdrawn from engagement with the beam hub 51, when it is desired to remove the warp beam 16 from its bearing mounts. For that purpose, the gudgeon 50 has an unsplined axial extension 52 extending with a snug slide fit in a smooth section of the internal bore of the journal 35 and has its outer end 54 accessibly projecting outwardly from the outer loomside web 13 for manipulation. For facilitating the handling of the gudgeon 50 in its axial movement in or out of beam supporting position, the outer projecting end 54 has secured thereto a handle 55 shown in the form of a pin extending diametrically through said projecting end.

For locking the gudgeon 50 in operative beam supporting position shown in Fig. 2, said gudgeon is provided with a circumferential slot 56 and there is provided a locking device comprising a detent lever 57 pivotally mounted intermediate its ends at 58 and having at one end a catch 60 in the form of a hook straddling the projecting end 54 and latching into the peripheral slot 56, to prevent axial movement of said gudgeon in limiting position of said gudgeon shown in Fig. 2. The detent lever 57 has an arm 61 on one side of the pivot support 58 formed with a flange extension 62 serving as a handle. A coil spring 63 around the pivot pin of the pivot support 58 serves to bias the detent 57 clockwise (Fig. 3) into position to lock the gudgeon against withdrawal from the beam hub 51.

The locking device described also serves to lock the gudgeon 50 against axial movement when it is fully withdrawn from the warp hub 51 and is in its other limiting position. For that purpose, the gudgeon 50 has a circumferential groove 64 similar to the groove 56. This groove 64 is located opposite the catch 60 on the detent 57 when the gudgeon has been fully withdrawn out of drive engagement with the warp beam hub 51.

The locking device operates to limit automatically the extent of axial movement of the gudgeon 50 between beam supporting operative position and beam releasing inoperative position, by snapping into locking position automatically when said gudgeon has been moved into either one of its limiting positions. To withdraw the gudgeon 50 from beam supporting position shown in Fig. 2, the detent 57 is manually rotated counter-clockwise (Fig. 3), until it is released from said gudgeon. The gudgeon 50 is then pulled axially outwardly through manipulation of its handle 55. After the slot 56 has been moved outwardly beyond the detent catch 60, the detent 57 can be manually released. The detent catch 60 will return into engagement with the gudgeon 50 and will bear thereagainst by the action of the spring 63, until the slot 64 on said gudgeon comes into alignment with said catch. At that instant, the spring 63 will snap the catch 60 into the slot 64 and thereby hold the gudgeon 50 in position against further withdrawal. The operation of moving the gudgeon 50 inwardly into warp beam supporting position may be effected in a similar manner and is also limited by automatic latch action of the detent 57, as already described.

The bearing mount 17 on the opposite end of the warp beam is similar to the bearing mount 18 and has a similar locking device for limiting the extent of axial movement of the gudgeon. The only main difference between 17 and 18, as already indicated is that there is no gear 25, but there is a sleeve journal which corresponds to the sleeve journal 35 and which is held against axial rotation while being supported for free rotation in bearings similar to the bearings 38 and 39. Furthermore, in the bearing mount 17, instead of depending on the gear hub 34 for holding the anti-friction bearing 38 in position, there is provided a simple collar and a lock nut similar to the collar 40 and lock nut 41 at the outer end of the bearing mount 18.

It is seen that with the warp beam mount 18 described, the beam head gear 25 always remains in mounted position and in mesh with the let-off pinion gear (not shown), even though the warp beam has been removed and replaced. This facilitates the handling of the warp beam in and out of mounting position and eliminates the necessity of moving the beam head gear 25 in and out of meshing position with the let-off pinion gear.

For lowering an empty warp beam 16 after the gudgeons 50 have been withdrawn from supporting position with respect to said warp beam and for lifting a full warp beam into axially aligned

position with respect to its bearing mounts, there is provided a mechanism comprising a pair of brackets 70 and 71 secured to the inner faces of the inner webs 12 of the two loomsides 10 and 11 respectively, as for example, by means of the bolts 72. Each of the brackets 70 and 71 has a pair of aligned bearings 73 and 74 for a shaft 75 carrying at its rear square end a handle 76 for rotating said shaft. Each of said brackets 70 and 71 is formed at its forward end with a pair of flanges 80 and 81 flanking a track 82 for a corresponding beam head 27 and pivotally support said track at 83. The forward end of the shaft 75 has keyed or otherwise secured thereto an eccentric cam 84 engaging the lower side of the track 82 and adapted to raise said track or permit said track to be lowered about its pivot support at 83 according to the manipulation of the turning handle 76.

A girt 86, shown in the form of a cylindrical tube, has its ends fitted over bosses 87 secured to or projecting from a flange 88 of the brackets 70 or 71 to reinforce the loom frame structure.

While the loom is operating, the handle 76 will be in the inoperative horizontal position shown in Fig. 6 and a low part of the eccentric cam 84 will be disposed on top. In this position, the track 82 will be lowered below the beam heads 27, so that they will have no supporting engagement therewith and the warp beam 16 will be free to operate without restrictions from the lifting mechanism. After the warp beam 16 has become empty, as shown in Fig. 4, and is ready to be replaced by a full one, the handles 76 are turned into position to rotate the eccentric cams 84 and to raise thereby the corresponding tracks 82 angularly upwardly into engagement with the peripheries of the beam heads 27, as shown in Fig. 5. In this track supporting position of the eccentric cams 84, the parts will be self-locked when the full weight of the empty warp beam 16 falls upon said cams. While the tracks 82 are in the warp beam supporting position shown in Fig. 5, the gudgeons 50 in the bearing mounts 17 and 18 are pulled out, so that the warp beam 16 is released for removal from these bearing mounts and the full weight of the warp beams rests on said tracks. In this raised position of the tracks 82, said tracks will form a continuous surface with the top surfaces of the respective brackets 70 and 71, so that the warp beam can be rolled easily along said tracks and said brackets onto a truck. The top supporting surfaces of the tracks 82 are desirably curved upwardly in one direction in raised position thereof and the top surfaces of the brackets 70 and 71 slope slightly in the opposite direction, so that when the gudgeons 50 are pulled out, the released warp beam 16 will not roll by itself off the tracks 82 or brackets 70 and 71, but will be retained thereon until manually rolled off.

After the empty warp beam has been removed from the loom, the full warp beam can be rolled onto the brackets 70 and 71 and the tracks 82, and said tracks can be raised or lowered by manipulation of the handles 76, until the warp beam is in axial alignment with its bearing mounts 17 and 18. When the warp beam has been so aligned, the gudgeons 50 in the bearing mounts 17 and 18 are moved inwardly to effect the connection of said warp beam with said gudgeons, as already described.

While the invention has been described with particular reference to a specific embodiment, it is to be understood that it is not to be limited thereto but is to be construed broadly and restricted solely by the scope of the appended claims.

What is claimed is:

1. In a loom, a warp beam, a bearing at one end of said warp beam, a sleeve journal in said bearing, and a gudgeon splined in said journal and said warp beam for axial movement therein and movable axially into and out of supporting spline engagement with one end of said warp beam.

2. In a loom, a warp beam having a beam barrel and a hub at one end of said barrel, an antifriction bearing at one end of said warp beam, a sleeve journal in said bearing, and a gudgeon splined in said journal and said hub for axial movement therein and movable axially into and out of supporting spline engagement with said hub.

3. In a loom, a warp beam, a bearing for one end of said warp beam, a gudgeon axially slidable in said bearing into either one of two limiting positions to bring said gudgeon into and out of supporting position with respect to said warp beam, and a detent spring-pressed towards said gudgeon, said gudgeon having a circumferential groove therein located thereon to bring said groove into position opposite said detent when said gudgeon has been moved axially into one of said limiting positions, said detent being adapted when said gudgeon is moved axially into said last-mentioned limiting position to extend into said groove and thereby to lock releasably said gudgeon in said latter limiting position.

4. In a loom, the combination as described in claim 3, said gudgeon having a second circumferential groove therein located to bring said groove into position opposite said detent when said gudgeon has been moved into the other limiting position, said detent being adapted when said gudgeon is moved axially into said other limiting position to extend into said groove and thereby to lock releasably said gudgeon in said other limiting position.

5. In a loom, a warp beam, a bearing at one end of said warp beam, a sleeve journal in said bearing, a beam head gear secured to said journal independently of said warp beam, and a gudgeon splined in said journal and said warp beam for axial movement therein and movable axially into and out of supporting spline engagement with one end of said warp beam.

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