June 29, 1965 SHIGEMATSU TAKITA 3,191,237

LATCHING DEVICE FOR LOAD ARMS FOR SPINNING MACHINES

Filed Feb. 6, 1962

FIG. 1

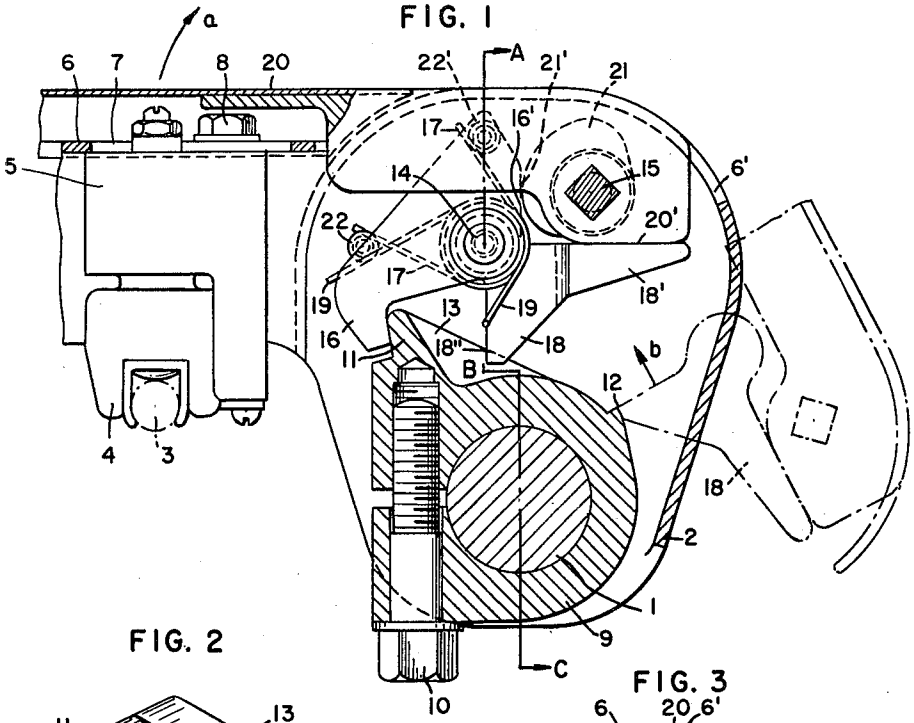


FIG. 2

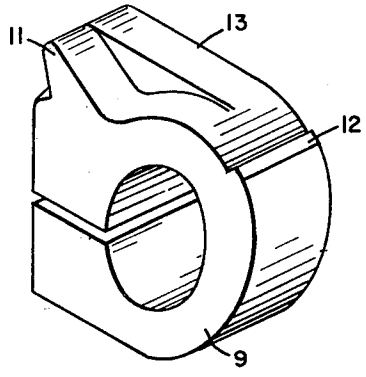


FIG. 3

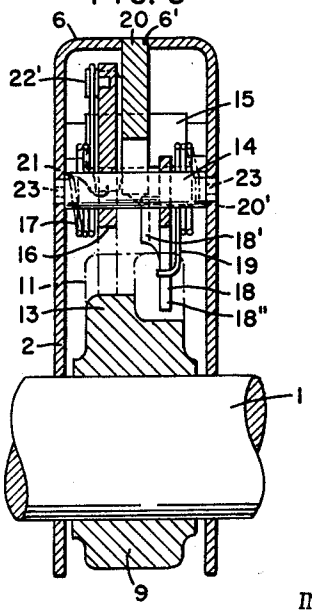
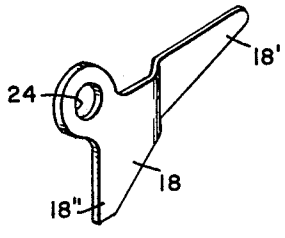


FIG. 4



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LATCHING DEVICE FOR LOAD ARMS FOR SPINNING MACHINES

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This invention relates to textile machines and, more, particularly, to a latching mechanism for the load arms of spinning machines.

It is the chief object of the invention to provide a device by which such arms may be positively but releasably held in lowered or operating position wherein the top rollers carried thereby are in operating or contacting relation with respective lower rollers, or in raised position out of contact with such lower rollers.

A second object is to provide a latching mechanism, as aforesaid, which is relatively simple to fabricate and assemble, positive in operation in holding the arm either in operating or in raised positions, as well as in effecting release of the arm from either of such positions.

Another object is to provide a mechanism as aforesaid, which makes it extremely easy and convenient to individually release each arm from either position and to move it to the other position and lock it there, as required in operation of such machines.

Other objects and advantages of the invention will become apparent to those skilled in the art after a study of the following detailed description in connection with the accompanying drawing.

In the drawing:

FIGURE 1 is an elevational view, partly in section, of the pivoted end of a load arm embodying the invention;

FIGURE 2 is a perspective detail view of the clamping ring;

FIGURE 3 is a section taken in planes identified by the broken line A-B-C, FIG. 1; and

FIGURE 4 is a perspective view showing the stop element for the load arm.

Referring in detail to the drawing, the numeral **1** identifies a fixed rod or lever on the roller stand. The load arm is identified at **2** and, as shown upon FIGURE 3, includes right and left depending side walls whose lower ends define an inverted U-shaped hub having aligned apertures sized for a smooth fit on the rod, so that the arm may be pivoted from its operating position shown in full lines upon FIG. 1, to a raised position as indicated by the dot-dash lins of the same figure which show a portion only of arm.

The load arm extends to the left as viewed upon FIG. 1 and has mounted thereon roller spindle bearing supports, one of which is identified at **5**, with its bearing **4** for spindle or shaft **3**. The load arm includes a plate **6** to which the several supports **5** are secured for longitudinal adjustment therealong. In the model illustrated this adjustment is provided by a cap screw **8** which is threaded into a tapped hole in support **5** and passes through a longitudinal slot **7** in plate **6**. Adjustment is effected in an obvious way by loosening screw **8** and re-tightening after support **5** has been moved to the desired position.

A split clamping ring **9**, of special form is fixed about rod **1** by cap screw **10**, FIG. 1, between the side walls of arm **2**. From FIG. 2 it is noted that this ring is formed with a ridge, or abutment **12** extending axially along a peripheral portion thereof, and a nose or projection **11** which extends upwardly and to the left, as the parts are viewed upon FIG. 1. A solid planar reinforcement **13** extends over one-half the axial dimension of the ring while the remaining half curves from nose **11** downwardly, then merges smoothly into a cylindrical surface centered on the axis of rod **1**, to abutment **12**.

A shaft **14** has end bearings **23** by which it is mounted in and between the vertical side walls of load arm **2**. A latch **16** is pivotally disposed upon this shaft and includes a hooked end, and a cam-engaging surface **16'**. When the arm is in the working position shown, latch **16** may engage over nose **11** of ring **9** and, when held in this position, locks or holds the arm against clockwise rotation about rod **1**. A spring **17** acts between an abutment **22** on the wall of arm **2** and a second abutment **22'** on the latch, to urge the latter out of locking engagement with the nose **11**, that is, clockwise as the parts are viewed upon FIG. 1.

A second shaft **15** is journaled by and between the side walls of the arm and has a squared portion on which a cam **21** is fixed and disposed so that when in the position shown upon FIG. 1, it engages surface **16'** of latch **16** to hold it in arm-locking position over nose **11**. One end of a manually-operable lever **20** depends through a slot **6'** in the upper or right part of the arm and is there fixed to shaft **15**. The other end of this lever extends over the projecting or distal end of arm plate **6**, as is clear from inspection of FIGURE 1. When the lever is raised from the locking position shown, that is, when it is rotated clockwise, cam **21** is thereby turned to free latch **16**, which then rotates under the urge of spring **17**, out of engagement with nose **11**.

A generally triangular stop member **18** is shown in perspective upon FIGURE 4 and has a bearing aperture **24** by which it is journaled upon shaft **14**. From FIGURE 3 it is noted that this stop member is mounted upon the right end of shaft **14** and that one end **18'** is axially offset to lie in a common plane with a cam surface **20'** of lever **20**. See also FIGS. 1 and 4. A spring **19** is wound about the shaft and has one bent end or apex engaging stop **18** and another in contact with abutment **22**, FIG. 1, to thereby urge the stop counterclockwise as viewed upon FIG. 1, with a limiting position in contact with cam surface **20'**.

Stop **18** has a second apex or tip **18''** which in the position of FIG. 1 lies closely adjacent that position of nose **11** which extends sharply downwardly, then upwardly, or, in other words, that position opposite the reinforced portion **13**. Reference to FIG. 3 also shows that the latch **16** is essentially coplanar in a plane normal to the axis of rod **1**, with reinforced or planar part **13** of ring **9**, so that when the latch is released under the urge of spring **17** and arm **2** is raised or pivoted clockwise, the hook on latch **16** rides on and along this reinforcement and hence is held thereby in a limited position of counterclockwise rotation.

In operation, when the parts are in the positions shown upon FIG. 1, cam **21** holds latch **16** in position locking arm **2** in operating position. When it is desired to raise the arm, lever **20** is raised as indicated by arrow "*a*," thus rotating cam **21** to a position wherein spring **17** may act to move the hooked end of latch **16** off nose **11**. The arm and parts assembled therewith, including stop **18**, may now be rotated or raised to the dot-dash line position of FIG. 1. When lever **20** is pivoted clockwise relatively to arm **2**, cam surface **20'** correspondingly pivots stop **18** about the axis of shaft **14**. This moves the tip of the stop radially of ring **9** so that it can clear abutment or ridge **12** thereon.

When the parts are in the raised position indicated in dot-dash lines, FIG. 1, counterclockwise pivoting of lever **20** relatively to the raised arm **2**, releases stop **18** for counterclockwise pivoting as indicated by arrow "*b*," under the urge of spring **19**. The stop is thus moved to a position behind or in contact with ridge **12** so that, although the mass center of the arm assembly is to the left of the axis of rod **1**, the arm is, nevertheless, positively held in raised position.

It should be noted that the arm may be moved to, and locked in raised position even although lever **20** is moved to the position shown upon FIG. 1, before the arm has

been fully raised. Under such conditions further rotation of the arm clockwise causes ridge 12 to cam stop 18 clockwise until it snaps over or behind the ridge.

When it is desired to again lower or rotate the arm to operating position, it is only necessary to rotate lever 20 clockwise relatively to arm 2 as the parts are viewed upon FIG. 1, to thus release the tip 18'' of stop 18 from ring 9. The arm and lever are then rotated as a unit until the arm is in the operating position shown. The lever 20 is pressed down to lock the hook of latch 16 over nose 11.

The invention thus provides a device which fulfills all the objects previously stated. The load arm is easily and positively fixed in its operating position, and as easily released by a slight pivoting of lever 20 and raised. When in the upper position it can be quickly secured against rotation under the influence of gravity, merely by pressing the lever down to its position shown relatively to arm 2, thus releasably securing the arm in raised position until released by reverse pivoting of the lever relatively to the arm. The device is simple and inexpensive to produce in quantities and effects large savings in time where many arms must be raised for ajustment and then lowered. It will be understood that the rollers on shaft or shafts 3 are urged downwardly by spring mountings which, beink known in the art, are not shown.

In the claims the term "operating position" as referred to the load arm, means a position wherein the top rollers carried thereby are in contact or operative relation with the corresponding lower rollers of the machine. The term "raised position" or "raised," as referred to the load arm, means a position wherein the rollers carried thereby are separated from the corresponding lower rollers.

Having fully disclosed the invention, I claim and desire to secure by Letter Patent:

1. A load arm mechanism for a textile machine, comprising, a load arm journaled for rotation about a fixed axis, from an operating to a raised position, a manually operable lever carried by said arm for movement between first and second positions relatively to said arm, a fixed abutment, first means operated by movement of said lever to first position when said arm is in operating position, to engage said fixed abutment and thereby releasably secure said arm in operating position about said axis, and second means operated by movement of said lever to first position when said arm is raised, to releasably secure said arm in raised position, movement of said lever to second position when said arm is raised operating said second means to free said arm for rotation to operating position.

2. A load arm mechanism for a textile machine, comprising, a fixed rod, a load arm including an inverted U-shaped hub defining a bight portion and spaced depending side walls journaled on said rod whereby said arm is rotatable between operating and raised positions, there being a slot in said bight portion in a plane normal to the axis of pivoting of said arm, a lever carried by and between said walls and manually pivotable relatively to said arm, from a first position occupying said slot, to a second position projecting through and out of said slot, first means operated by rotation of said lever to first position to releasably secure said arm in operating position, and to release said arm when said lever is in second position, and second means operated by movement of said lever to first position, when said arm is raised, to releasably secure said arm in raised position.

3. In a load arm mechanism for a spinning machine, a rod, a load arm pivoted on said rod for rotation from a first operating position to a second raised position, a first fixed projection, a latch carried by said arm and movable from a first position engaging said first projection, to thereby hold said arm in operating position, to a second position released from said first projection, means urging said latch to second position, a cam mounted on said arm for pivotal movement from locking to release positions and, in locking position, engaging and holding said latch in first position, movement of said cam to release position freeing said latch for movement to second position, a lever fixed with said cam and operable to pivot the same between its said locking and release positions, a second fixed projection, a stop member pivoted on said arm and having a position normally lying in the path of said second projection as said arm is raised, spring means engaging said stop member and urging the same into the path of said second projection, and means operated by movement of said lever in rotating said cam to release position, to engage and pivot said stop member out of the path of said second fixed projection, against the urge of said spring means.

4. In a load arm mechanism for a spinning machine, a fixed rod, a load arm having a hub portion comprising spaced depending walls journaled on said rod to mount said arm for pivotal movement from a first operating position to a raised position, a ring fixed with said rod and including an upwardly-directed nose, a latch mounted by and between said walls of said load arm for pivotal movement from a first position wherein a hooked end of said latch engages said nose of said ring to hold the arm in operating position, to a second position releasing said hooked end from said nose, a spring urging said latch to second position, a cam mounted by and between said walls and rotatable from a latching position engaging and holding said latch in its said first position, to a position releasing said latch for pivoting to second position, and a lever fixed with said cam and manually actuable to move the same between latching and releasing positions.

5. A load arm mechanism as in claim 4, a ridge on said ring angularly spaced from said nose, and a stop member pivoted by and between said walls and having first and second projections engageable respectively with said lever and said ridge, pivoting of said lever to release position relatively to said arm, effecting corresponding pivoting of said member to move said second projection out of the way of said ridge, pivoting of said lever to latching position relatively to said arm when said arm is raised, pivoting said member to position said second projection for engagement with said ridge to thereby releasably hold said arm in raised position.

6. A load arm mechanism as in claim 4, a first shaft mounted by and between said walls, said latch and member being pivotally and independently mounted on said first shaft.

7. A load arm mechanism as in claim 6, a second shaft journaled by and between said arms, said cam being fixed with said second shaft.

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