July 28, 1953 E. C. JOHNSON 2,646,824

BOSS FOR DOBBY JACKS

Filed July 18, 1951

Fig. 1.

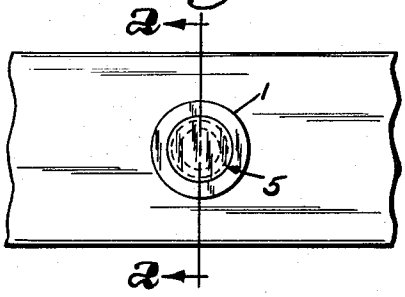


Fig. 2.

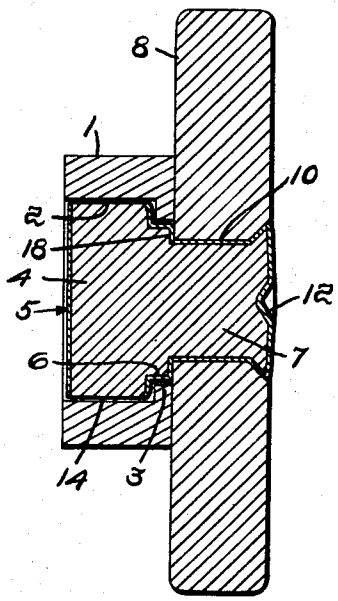


Fig. 3.

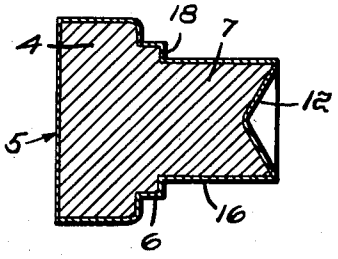
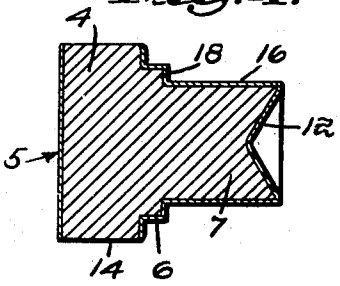


Fig. 4.



Inventor:
Emil C. Johnson,
by Robert K. Randall.
Attorney

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BOSS FOR DOBBY JACKS

Emil C. Johnson, Manchester, Conn., assignor to H. F. Livermore Corporation, Allston, Mass., a corporation of Delaware

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9 Claims. (Cl. 139—74)

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This invention relates to dobby motions in looms, and more particularly to dobby jacks.

In a common form of dobby motion the hooks controlled by the pattern chain transmit the motion imparted to them by the knives to the dobby jacks through jack-backs which are pivotally connected to the jacks by bosses formed integrally on the jacks. These bosses project into the center bearings of the jack-backs and are made of a length or height matching the thickness of the jack-backs, so that the jacks can be positioned close together side by side for compactness in the dobby head, reliance being placed solely on the next adjacent jack to hold the intervening jack-back in place on its pivot. Since sufficient clearance must be given to allow the individual jacks to move freely with respect to each other in response to the demands of the pattern, the jack-backs are able to deviate away from their proper jacks outwardly on the bosses forming their pivots, with the result that the bosses wear most rapidly toward their outward ends, departing from their desired cylindrical form and rounding off their outer edges on which the wear concentrates in an oblique manner which results in lost motion depriving the jack of its intended scope of movement, and also camming the jack-back sidewise into interference and jamming contact with the adjacent jack, impairing the latter's freedom of movement. Since these bosses are conventionally an integral portion of the casting comprising the jack, this wear of the bosses ordinarily compels discarding and replacing of the entire jack. A repair has been proposed consisting of machining and drilling the boss to make possible the installation of a stud-like boss, usually made of bronze, rigidly and non-rotatably riveted to the jack, which at best is only a temporary expedient, as it is subject to the same weaknesses of rapid wear and jamming of the adjacent jacks, particularly on heavy loads of harnesses, where it sometimes wears out in a week's use.

In both these cases, additionally, wear of the center bearing of the jack-back which rides on the boss occurs because of the relative rotation of the boss' surface within such bearing, eventually requiring replacement of the jack-back also.

An important object of the invention therefore is to enable a jack which has been rendered unusable through wear of the integral boss initially formed thereon to be repaired and continued in use, by removing the boss thereon.

Another object of the invention is to provide

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a replacement boss of simple and compact proportions which embodies few parts and yet is constructed so that wear through engagement with the jack-back is not concentrated on one portion of the outer rim to round off its edges or to diminish its working diameter, but is distributed uniformly around the boss.

Another object of the invention is to provide a boss capable of supporting a greater load than heretofore, and at the same time to increase the life of the jack.

A further object is to provide a boss which will largely eliminate or reduce to a negligible degree the wear of the center bearing of the jack-back incident to its pivotal mounting on the jack.

To these ends I have devised a novel replacement boss comprising a stud for attachment to the jack and a roll rotatably mounted on the stud, the roll supporting the jack-back and the interengaging surfaces on the stud and the roll being hardened, while the shank of the stud is made soft and malleable to be headed over after the shank has been located in a hole formed through the jack for its reception.

By use of such device the jack is restored to useful condition. Further, the wear is taken off of the jack-back and placed on the stud and roll, being distributed evenly around the entire inside surface of the roll. When the roll finally through long use wears down to an improper size and fit, it can easily be replaced by an identical boss without the necessity of discarding and replacing the jack, which in itself is a source of expense.

An illustrative embodiment of the device is shown in the accompanying drawings, in which

Fig. 1 is an elevation of a portion of a dobby jack showing the roll and mounting stud comprising the novel boss fixed thereon.

Fig. 2 is a section on line 2—2 of Fig. 1.

Figs. 3 and 4 show the stud in section, illustrating successive stages in the manufacture of the stud.

The improved replacement boss comprises a steel roll 1 having a central aperture 2 which fits rotatably about the cylindrical surface 14 of the head 4 of a stud 5 fixed in the jack lever 8. Roll 1 is retained in place on the head of the stud by reason of an inwardly extending annular flange 3 which fits about a neck portion 6 of the head 4 of the stud which is of reduced diameter intervening between the full diameter head 4 and the shank 7 of the stud. This boss is applied to the jack lever at the same location as that of the original integral boss formed thereon.

For this purpose, the center of the original boss is spotted and a hole 10 drilled through the jack concentric therewith, of the proper size to receive the shank 7 of stud 5, and countersunk at its extremity remote from the boss, and thereafter the remainder of the old boss is ground off flush with the adjacent surface of the jack.

The stud 5 is most securely fixed to the jack 8 by being riveted thereto, and for this purpose the shank 7 is made soft enough for heading over and also provided with a conical recess 12 facilitating the expansion of the end of the shank into the countersunk extremity of hole 10 as indicated in Fig. 2, while avoiding the formation of a protruding head at this surface of the jack lever. The roll 1 is made to fit closely within the hub or bearing provided at midlength of the jack-back (not shown) for its connection to the jack lever. But in accordance with the invention and contrary to the practice with the integral boss, this roll is not intended to have relative movement within the hub or bearing of the jack-back; instead, all or most of the relative motion is intended to occur at the bearing surfaces comprised by the interior surface of aperture 2 of the roll and the opposing cylindrical surface 14 of the stud 5.

To attain a long life of the boss, provision must be made for preparing these bearing surfaces to endure their mutual contact, and because the boss is in novel manner made in two parts, it becomes simple in accordance with the invention to prepare these surfaces to receive such wear, by the step of hardening them. Thus, the entire roll 1 is hardened as a unit wholly apart and away from the stud, by any suitable or desired known hardening process. The stud presents a different problem, since its shank 7 must be left soft and malleable to provide for being riveted in place in jack 8. However, by coating the entire surface of a stud made of low carbon steel with a layer 16 of "resist," as shown in Fig. 3, which for one example is effected simply by copper-plating the stud, and then grinding off such resist from the cylindrical surface of the head 4 of the stud to leave the underlying component steel of the surface 14 exposed, as indicated in Fig. 4, which is easily done in a centerless grinder, hardening of the surface 14 alone can be easily accomplished by a cyanide treatment in well known manner. Thus the bearing surfaces of the roll interior and the head of the stud are made capable of enduring long wear without rounding off or wearing obliquely, a suitable lubricant being occasionally supplied, and wear of the jack-back by the boss is eliminated entirely or largely reduced, while the replacement boss is capable of being applied to and fixed in the jack lever in a very strong and secure manner by riveting it thereto.

The location of the bearing surface provided on the stud for the support of roll 1 is important in reducing the work and cost of making the novel boss to practical levels. By making the retaining flange on the roll 1 instead of on the stud, and making the part of the stud which has the greatest diameter serve as the bearing surface, the stripping of this surface 14 in most economical manner by the precise and nearly automatic action of a centerless grinder is made possible.

The neck portion 6 of stud 5 which intervenes between the head and the shank serves as a spacer permitting the stud to be drawn down against the surface of jack 8 to seat the intervening radial shoulder 18 with the requisite tightness against the face of jack 8, while leaving the flange 3 of roll 1 loose and free. That is, portion 6 of the stud has greater axial extent than flange 3 of the roll.

By making the annular retaining flange 3 on the roll very narrow, a wide bearing surface 14 can be provided on the stud and thereby render the roll capable of supporting a heavier load through preventing the concentration of wear on the outer rim or any one portion of the roll.

While I have illustrated and described a certain form in which the invention may be embodied, I am aware that many modifications may be made therein by any person skilled in the art, without departing from the scope of the invention as expressed in the claims. Therefore, I do not wish to be limited to the particular form shown, or to the details of construction thereof, but what I do claim is:

1. A replacement boss for a part of the dobby motion of a loom comprising in combination a relatively hard metallic roll having an annular flange at one end, and a metallic stud for rotatably supporting the roll on the dobby part and retaining the roll by means of the roll's annular flange, the stud having a relatively soft metallic shank for riveting to the said part of the dobby motion.

2. A replacement boss for a dobby jack comprising in combination a headed metallic stud having a relatively soft metallic shank integral therewith for attaching the stud to the jack and a relatively hard bearing surface, and a relatively hard metallic roll rotatably mounted on the stud having an annular flange integral therewith retaining the roll on the stud by engagement under the latter's head.

3. A replacement boss for a dobby jack having in combination a metallic roll having an annular flange at one end integral therewith, and a metallic stud provided with a head and a neck, the latter acting as a spacer spacing the head from the jack, such stud rotatably supporting the roll and retaining the latter by means of the annular flange.

4. A replacement boss for a dobby jack, having in combination, a relatively hard metallic roll having an annular flange integral therewith, and a metallic stud having an enlarged head and a reduced portion fitting within the flange and seating against a surface on the dobby jack, such stud rotatably supporting the roll and retaining the latter by means of the roll's annular flange, and having a relatively soft metallic shank for attaching the stud to the jack.

5. A replacement boss for a dobby jack, having in combination, a relatively hard metallic roll having an annular flange integral therewith, a metallic stud having an enlarged head relatively hard at its periphery and a reduced portion fitting within the flange and seating against a surface on the dobby jack, such stud rotatably supporting the roll and retaining the latter by means of the roll's annular flange, and having a relatively soft metallic shank for attaching the stud to the jack.

6. A replacement boss for a dobby jack, having in combination, a relatively hard metallic roll having an annular flange integral therewith, a metallic stud having an enlarged head relatively hard at its periphery and engaged by the roll, and having a reduced portion fitting within the flange and seating against a surface on the dobby jack, such stud rotatably supporting the

roll and retaining the latter by means of the roll's annular flange, and having a relatively soft metallic shank for attaching the stud to the jack.

7. A replacement boss for a dobby jack, having in combination, a relatively hard metallic roll having an annular flange at one end of the roll integral therewith, and a metallic stud having an enlarged head and a reduced portion fitting within the flange and seating against a surface on the dobby jack, the head of such stud having a relatively hard peripheral surface rotatably supporting the roll and retaining the latter by means of the roll's annular flange, and having a relatively soft metallic shank for attaching the stud to the jack.

8. A replacement boss for a dobby jack, having in combination, a relatively hard metallic roll having an annular flange integral therewith, and a metallic stud having an enlarged head with a hardened peripheral surface rotatably supporting the roll and retaining the latter by means of the roll's annular flange, the stud having a soft metallic shank for attaching the stud to the jack.

9. A replacement boss for a dobby jack, having in combination, a relatively hard metallic roll having an annular flange integral therewith, and a metallic stud having an enlarged head and a reduced portion fitting within the flange and extending therethrough seating against a surface on the dobby jack, the head of such stud having a relatively hard peripheral surface in rotational engagement with the roll and retaining the latter by means of the roll's annular flange, and having a relatively soft metallic shank with a conical recess in its extremity for attaching the stud to the jack.

EMIL C. JOHNSON.

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