March 31, 1953 E. A. MASTRIANI ET AL 2,633,156

LUG STRAP

Filed April 21, 1950 2 SHEETS—SHEET 1

Fig. 1

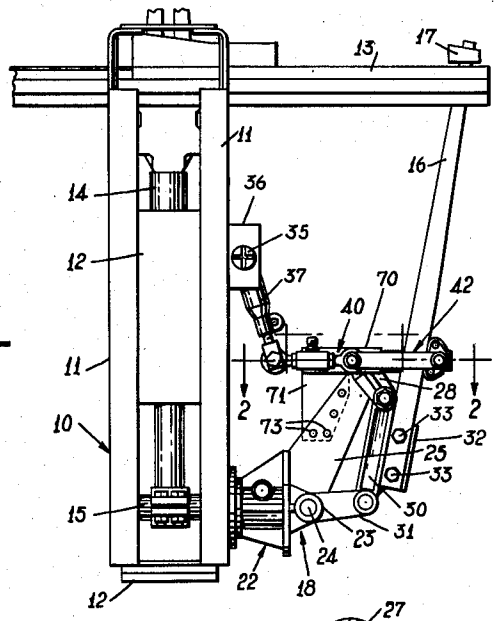



Fig. 2

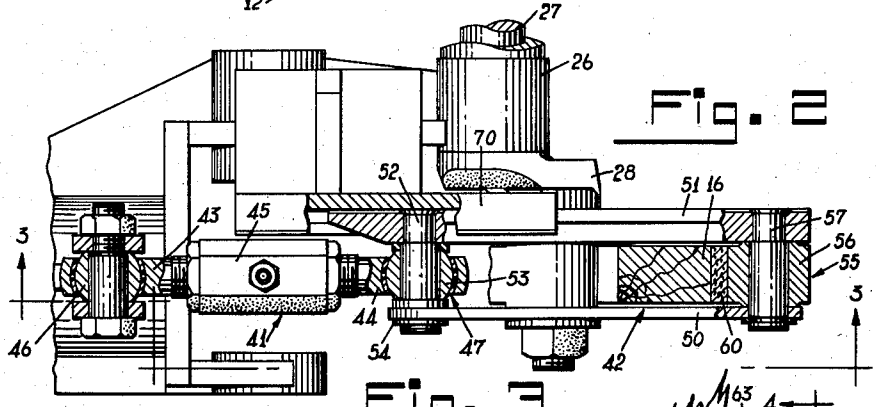



Fig. 3

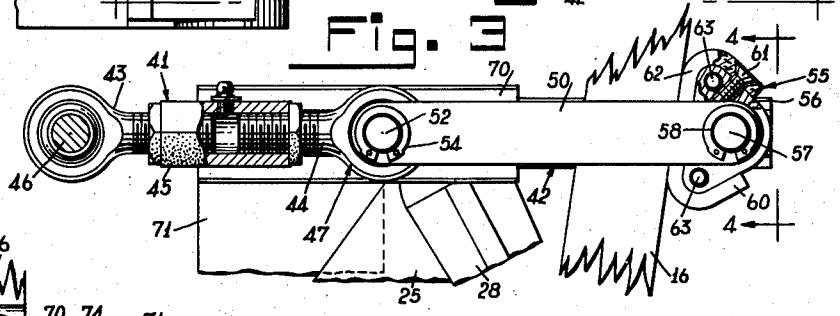
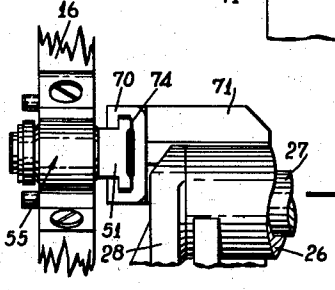



Fig. 4




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Fig. 5

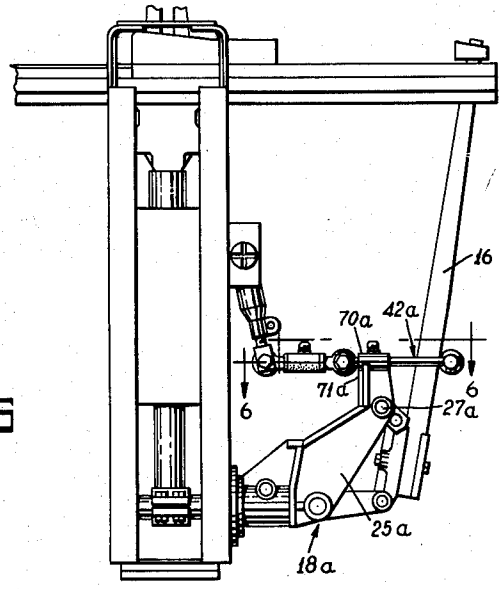
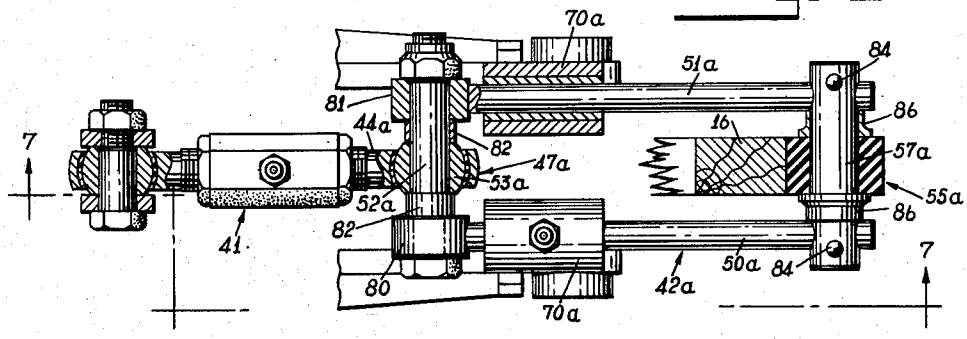



Fig. 6



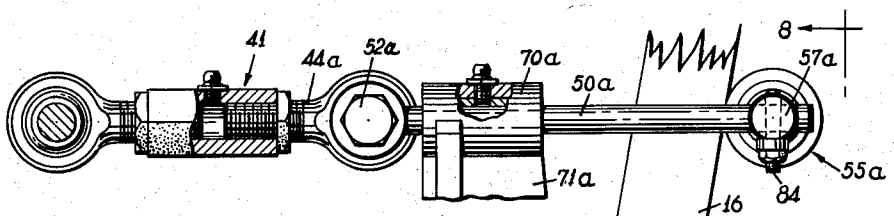




Fig. 7

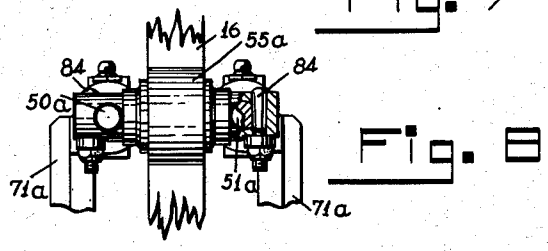



Fig. 8

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# UNITED STATES PATENT OFFICE

2,633,156

## LUG STRAP

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Application April 21, 1950, Serial No. 157,382

4 Claims. (Cl. 139—151)

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The present invention relates to pick motions for fly shuttle looms and more particularly to the means for transmitting movement from the pick shaft to the picker stick.

A conventional type of means for transmitting movement from the pick shaft to the picker stick comprises a pick shaft arm secured at one end to the pick shaft and connected at its other end to the picker stick by a lug connector comprising a lug stick attached to the pick shaft arm and a flexible lug strap looped around the picker stick and having its heel or bend engaging the outer edge of said stick directly or through a cushioning pad. Means secured to the picker stick either in the form of a rest or in the form of a sling strap for the lug strap supports or holds the outer end of the lug strap.

As the picker stick is drawn inwardly to hurl the shuttle across the loom, the angle of the lug strap with respect to the picker stick is changed, so that the angle of the heel surface of the lug strap bearing against the outer edge of the picker stick changes with respect to said edge. As a result, the picking force transmitted to the picker stick is concentrated on the stick over a small area. Consequently, considerable strain is brought to bear on the picker stick and on the lug strap, so that the picker stick frequently splits or breaks in operation and the lug strap or the stick engaging cushion pad carried by said lug strap wears out very quickly. Moreover, the attachments on the picker stick necessary to support the lug strap at the right pitch with respect to said stick adds to the complication of the pick motion, makes it that much harder to assemble or disassemble and adds to the inertia of the picker stick, especially when stopping.

Furthermore, the conventional lug strap must be adjusted along the picker stick until the force of the pick is just sufficient to run the loom without banging-off. This requires special adjusting devices making it possible for these devices to go out of adjustment and adding to the structural and inertial complications of the pick motion.

One object of the present invention is to provide a comparatively simple but effective means for transmitting movement from the pick shaft to the picker stick, in which the disadvantages of prior constructions described are either eliminated or at least materially minimized.

Various other objects of the present invention are apparent from the following particular description and from an inspection of the accompanying drawings, in which:

Fig. 1 is a front view of the right-hand side

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of a loom showing a pick motion constituting one embodiment of the present invention;

Fig. 2 is a section of the pick motion taken approximately along lines 2—2 of Fig. 1, but shown on a larger scale;

Fig. 3 is a section of the pick motion taken approximately along lines 3—3 of Fig. 2;

Fig. 4 is a fragmentary side view of the pick motion taken approximately along lines 4—4 of Fig. 3;

Fig. 5 is a front view of the right-hand side of a loom showing a pick motion constituting another embodiment of the present invention;

Fig. 6 is a section of the pick motion of Fig. 5 taken approximately along lines 6—6 of Fig. 5, but shown on a larger scale;

Fig. 7 is a section of the pick motion of Fig. 5 taken approximately along lines 7—7 of Fig. 6; and

Fig. 8 is a fragmentary side view of the pick motion shown in Fig. 5 taken approximately along lines 8—8 of Fig. 7.

Referring to Figs. 1–4 of the drawings, the pick motion on the right-hand side of the loom is shown, but it must be understood that the pick motion on the left-hand side of the loom is of similar construction.

The loom comprises loomsides 10, each including a pair of vertical opposed webs or plates 11 rigidly secured together by braces and crosspieces 12. A lay 13 is reciprocated along the loom by lay swords 14 secured thereto and oscillated from cranks (not shown) through connecting rods (not shown) in a manner well known in the art. Each of these lay swords is located between the plates 11 of the corresponding loomside 10 and is fastened at its lower end to a respective rocker shaft 15 journalled in suitable bearings (not shown) mounted on the plates 11.

A picker stick 16 is provided with a picker 17 at its upper end for hurling the shuttle (not shown) across the raceway of the lay 13. The picker stick 16 is connected at its lower end to a parallel motion 18 serving to move the picker 17 in a direction as nearly as possible parallel to the raceway.

The parallel motion 18 per se forms no part of the present invention, but forms the subject matter of a copending application Serial No. 157,381, filed April 21, 1950, now Patent No. 2,575,465. The parallel motion 18 is shown for purposes of illustration comprising a bracket 22 secured to a cantilever part of the rocker shaft 15 and having pivot supports 23 for pivot pin 24 transverse to said rocker shaft. Secured to or otherwise rigid

with the bracket 22 is a frame plate 25 mounting a bearing 26 for a crank shaft 27 parallel to said pivot pin. Secured to the crank shaft 27 is a crank 28 pivotally connected to one end of a link 30, the other end being pivotally connected to an arm 31 supported on the pivot pin 24. The link 30 has a side extension 32 for holding the lower end of the picker stick 16 and for mounting said stick through bolts 33.

With the parallel motion described, as the picker stick 16 is drawn inwardly sideways of the loom through the operation of the pick motion, to be described, from the position shown in Fig. 1 about the axis of the movable pivot connection at the lower end of the link 30, the crank 28 is swung clockwise about the axis of the crank shaft 27. This moves the link 30 not only angularly about the axis of its lower pivot connection with the arm 31 but also endwise downwardly, so that the picker 17 at the end of said stick moves during its inward shuttle hurling stroke substantially parallel to the lay raceway.

The pick motion for drawing the picker stick 16 inwardly for shuttle movement comprises a picking cam (not shown) mounted on a camshaft (not shown) and acting on a follower (not shown) carried at the end of an arm (not shown) rigid with and extending transversely of a picking shaft 35. The picking shaft 35 is supported in bearings 36 secured to the outer plate 11 of the loomside 10. Fastened to the picking shaft 35 is a picking-shaft arm 37.

The pick motion described so far, may be of conventional construction. The action of this part of the pick motion is as follows: As the projecting part or nose of the picking-cam on the cam-shaft strikes the follower, it rotates the picking shaft 35 and causes the picking-shaft arm 37 to swing inwardly about the axis of said picking shaft. A lug connection 40 between the outer end of the picking-shaft arm 37 and the picker stick 16 transmits the movement of the shaft arm to the picker stick 16 and draws the picker stick sideways inwardly towards the loom. The picker stick, by means of the force with which it is drawn in, hurls the shuttle across the loom and into the opposite box.

As a feature of the present invention, the lug connection 40 between the outer end of the picking-shaft arm 37 and the picker stick 16 comprises a rigid lug stick 41 and a rigid lug strap 42 connected to said stick and guided for endwise movement in a fixed direction. The lug stick 41 is adjustable in length and for that purpose is in the form of a turnbuckle comprising two eyebolts 43 and 44 connected together by a coupling sleeve 45 threaded onto said eyebolts. The eyebolt 43 is swiveled to the lower end of the picking-shaft arm 37 by a self-aligning bearing shown in the form of a ball and socket universal connection 46. The other eyebolt 44 is similarly swiveled to the end of the lug strap 42 by a self-aligning bearing 47 in a manner to be described.

The lug strap 42 comprises a pair of rigid bars 50 and 51 desirably of metal flanking the picker stick 16. A pivot pin 52 passes through the inner ends of the strap bars 50 and 51 and through the eye of the bolt 44, and a bearing ball 53 between said pin and said eye forms the self-aligning or universal connection 47. A snap ring 54 on the pivot pin 52 is desirably employed to prevent displacement of said pin axially.

The outer ends of the strap bars 50 and 51 project beyond the picker stick 16 and carry a catch 55 engaging the outer edge of said picker stick. The catch 55 on the heel of the lug strap 42 comprises a rigid block 56 which is substantially in the shape of an isosceles triangle and which is pivotally supported by a pivot pin 57 passing through the outer ends of the strap bars 50 and 51 and through said block near its apex. A snap ring 58 on the pivot pin 57 is desirably employed to prevent displacement of said pin axially.

The block 56 has one flat side facing the edge of the picker stick 16 and has this side covered with a pad 60 of suitable cushioning material such as leather. The ends of the cushioning pad 60 pass over the inclined sides of the block 56 and are attached thereto, as for example, by studs 61, permitting easy replacement of said pad when worn.

The catch 55 swivels freely about the pivot pin 57, as the picker stick 16 is drawn inwardly to maintain good surface contact between the bearing surface 62 of the catch 55 and the outer edge of the picker stick. To limit the swivel movement of the catch 55 and to assure thereby the facing of the bearing surface 62 towards the picker stick 16, even when said stick is away from said surface, the block 56 carries a pair of strap pins 63 on opposite sides of the strap bars 50 or 51 adapted in limiting position of said catch to engage either one or both of said strap bars.

The lug strap 42 is guided for endwise movement as it is operated. For that purpose, there is provided a guide 70 integral with or otherwise secured to the upper end of a frame plate 71 secured to the frame plate 25, as for example, by bolts 73. The guide 70 has a slot 74 which is T-shape in section as shown, but which may be of dovetail shape and the strap bar 51 is of corresponding formation to fit in said slot with a guide fit.

Since the guide 70 rocks with the parallel motion bracket 22, it moves with the picker stick 16 along the loom following the motion of the lay 13. The self-aligning bearing or connection 46 permits deviation between the lug connection 40 and the picking shaft arm 37 resulting from this movement of the picker stick and the self-aligning bearing or connection 47 between the lug stick 41 and the lug strap 42 permits the lug strap to be maintained in horizontal position, even though the length of said lug stick has been adjustably varied.

The guide 70 extends substantially horizontally and maintains the lug strap 42 substantially horizontally in its endwise picking operations. Since the support of the lug strap 42 is through the guide 70, the use of attachments on the picker stick 16 for strap supporting purposes is dispensed with and the inertia of the stick especially when stopping is consequently decreased. Moreover, the swiveling catch 55 maintains a constant bearing surface against the outer edge of the picker stick 16, thereby assuring the application of effective picking force on said picker stick through the lug connection 40 with minimum of wear or destructive action on the stick and on the cushion pad 60 of the catch 55. Also, the lug connector 40 is easy to assemble or disassemble.

Figs. 5–8 show an alternative form of construction in which the lug strap 42*a* comprises a pair of round rigid bars 50*a* and 51*a* desirably of metal flanking the picker stick 16 and rigidly carrying at one end, as for example by welding, axially aligned collars 80 and 81 respectively. A pivot bolt 52*a* passes through the collars 80 and 81 and through the eye of the bolt 44*a*, and the

bearing ball 53*a* between said pin and said eye forms the self-aligning or universal connection 47*a*. Sleeves 82 on the pivot bolt 52*a* retain the bearing ball 53*a* and the lug stick 41 against displacement along said pivot bolt.

The outer ends of the strap bars 50*a* and 51*a* pass through the ends of an axle pin 57*a* and are secured thereto by tapered bolts 84. A roller 55*a* of cushioning material such as rubber or leather is supported for free rotation on the axle pin 57*a*, is retained on said pin against axial displacement by spacers 86 and peripherally engages the outer edge of the picker stick 16.

For guiding the lug strap 42*a* for endwise movement, the frame plate 25*a* mounting the crank shaft 27*a* for the parallel motion 18*a* is of double web construction and has corresponding upward extensions 71*a* terminating at their upper ends in respective tubular guides 70*a* for the strap bars 50*a* and 51*a*.

The advantages of the construction of Figs. 5–8 are similar to those inherent in the construction of Figs. 1–4, except that better dynamic balance is afforded in the construction of Figs. 5–8 as a result of its symmetrical double strap guiding arrangement.

While the invention has been described with particular reference to specific embodiments, 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 pick motion for the picker stick of a loom, a lug connection comprising a lug stick and a lug strap connected end to end, and means independently of the picker stick for supporting and guiding said lug strap for endwise movement.

2. In a pick motion for the picker stick of a loom, a lug strap comprising a pair of rigid parallel lug bars connected together as a unit, and a guide rockable with said picker stick along the loom and having a guide slot, one of said bars



extending into said slot with a slide interlocking guide fit, to support said lug strap, independently of the picker stick and to guide it endwise in its picking movement.

3. In a pick motion for the picker stick of a loom, a lug strap comprising a pair of rigid parallel lug bars connected together as a unit, and guiding means engaging one of said lug bars and guiding said one lug bar in its endwise movement, the other of said lug bars being free from direct guidance but being constrained in its movement by its connection with said one of said lug bars.

4. In a pick motion for the picker stick of a loom, a rigid lug strap comprising a pair of parallel lug bars flanking said stick, a catch between said bars pivotally connected to the outer end of said strap, and means guiding and supporting said strap independently of said picker stick for endwise substantially horizontal movement.

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