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2,110,105

PICK MOTION

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Fig. 1.

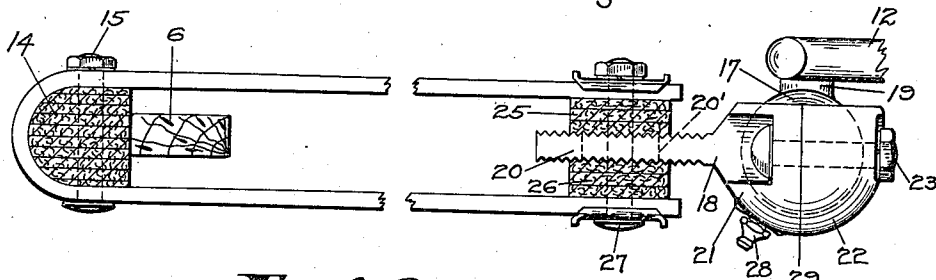
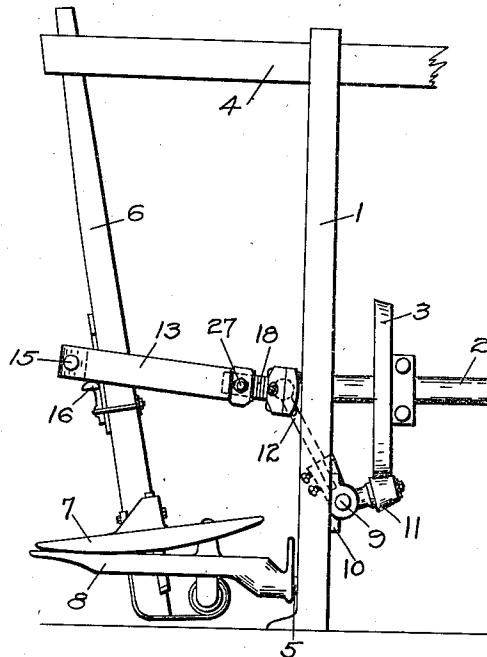


Fig. 2.

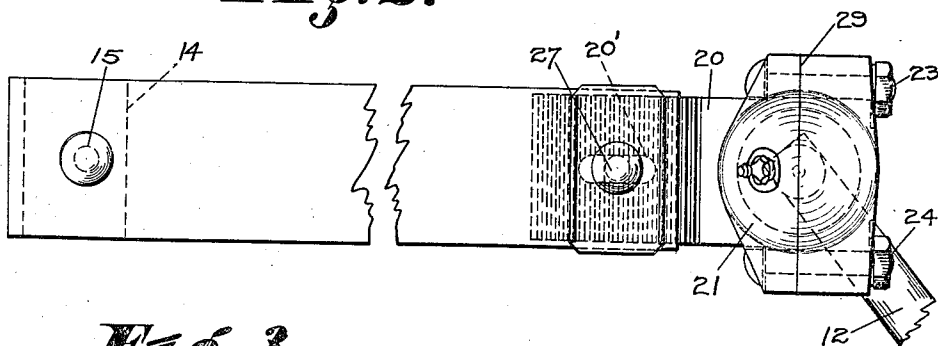


Fig. 3.

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PICK MOTION

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The present invention pertains to pick motions for fly shuttle looms and has more particular reference to the construction and arrangement of means for transmitting movement from a pick shaft to a lay-carried picker stick.

Prior to the present invention, fly shuttle looms were commonly provided with a pick shaft having a pick arm oscillating in a vertical plane, and a lug strap connecting the pick arm with a lay-carried picker stick. The picker stick is moved inwardly, i. e., widthwise of the loom, by the pick arm and lug strap and also moves forwardly and rearwardly with the lay. The outer or picker stick end of the lug strap moves forwardly and rearwardly with the picker stick, thus requiring a universal connection between the inner end of the lug strap and the pick arm. Such universal connection has heretofore consisted of a finger formed on or attached to the pick arm and passing very loosely through the lug strap. Prior attempts to improve on this construction by providing a ball and socket type of universal have not been successful and the proposed constructions are not used commercially, in spite of the many disadvantages of the construction which has been so used.

I propose to provide a pick motion including a pick shaft having an arm oscillating in a vertical plane, a substantially horizontal lug strap, and a ball and socket connection between the inner end of said lug strap and the free end of the pick arm, which pick arm, lug strap and connection shall be of a simple, substantial, and otherwise commercially practicable construction.

The foregoing and other objects of the invention are accomplished in the construction illustrated on the accompanying drawing, of which:

Fig. 1 is a view in front elevation of a loom having the preferred embodiment of my invention applied thereto;

Fig. 2 is a plan view, to a larger scale, of part of the pick motion of Fig. 1; and

Fig. 3 is a view of the same in front elevation.

The drawing shows only the preferred form of my improved pick motion and some of the conventional loom parts directly associated therewith or related thereto, other parts and mechanisms of the loom which are not shown being of any suitable usual construction and forming no part of the present invention. Of the conventional parts, Fig. 1 shows part of the loom frame comprising the left hand loom side 1, a cam shaft 2 carried by the loom frame and having a pick cam 3, a lay beam 4 which is suitably supported on a rocker shaft 5 for reciprocation toward and from the front of the loom,

and a picker stick 6 having a parallel shoe 7 which rocks on a parallel 8 carried by the rocker shaft 5.

A pick shaft 9 is supported in suitable bearings 10 carried by the loom frame. The axis of the pick shaft shown is horizontal and extends forwardly and rearwardly of the loom. The pick shaft has a cam follower arm 11 which engages the pick cam 3, whereby the shaft is oscillated by the cam. The pick shaft also has a pick arm 12 which in the present instance extends upwardly. The pick arm 12 oscillates in a vertical plane and the upper end thereof moves in a direction outwardly and inwardly of the loom.

The parallel 8 rocks with the rocker shaft 5 and the top of the picker stick 6 is carried forwardly and rearwardly by the lay beam 4. The picker stick is thus lay-carried in that it oscillates forwardly and rearwardly with the lay. The picker stick also has an operative or picking movement inwardly of the loom. Such picking movement is imparted by a lug strap 13 which is connected to and operated by the pick arm 12 in a manner to be hereinafter described. The lug strap 13 is formed from a single flat strip of vulcanized fiber or the like which is bent between its ends to provide parallel inwardly extending side runs. A suitable cushion such as a stack of leather pieces 14 is fixed in the outer end of the lug strap by a bolt 15. The picker stick 6 extends upwardly through the lug strap in position to be engaged by the cushion 14. A conventional supporting means 16, clamped to the picker stick, supports or holds the outer end of the lug strap so that the lug strap extends approximately horizontally.

The outer end of the lug strap 13 moves forwardly and rearwardly with the picker stick simultaneously with its inward and outward movement. The lug strap being rigid, a universal connection between the inner end of the lug strap and the pick arm is required. In accordance with the present invention, such connection comprises a novel construction and arrangement of a ball and socket joint and the preferred embodiment thereof includes a ball 17 and a connector member 18.

The ball 17 is fixed to the upper or free end of the pick arm 12 preferably by being formed integrally therewith. This ball is offset to one side of the vertical plane in which the pick arm 12 oscillates, but the center of the ball is in alignment with the longitudinal axis of the lug strap 13. One side of the ball may be joined to the

pick arm 12 by an integral neck portion 19. A pick arm thus constructed may be cast or forged at little or no added expense, as compared to the conventional prior pick arms having a cylindrical or rounded finger as above mentioned.

The connector member 18 consists of two parts bolted together or, more specifically, of a plate 20 having a two part head. One part 21 of such head is formed integrally with the plate 20 and the other part 22 is bolted thereto by bolts 23 and 24. The plate 20 is centrally located between the inner ends of the side runs of the lug strap and is fixed thereto. In the embodiment shown, leather cushions 25 and 26 are positioned on opposite sides of the plate 20 and a bolt 27 passes through the lug strap, cushions and a slot 20¹ in the plate and clamps the parts together. The slot 20¹ permits adjustment of the plate longitudinally of the lug strap.

The head 21, 22 of the connector member 18 is provided with a hollow spherical socket within which the ball 17 is received. The diameter of the socket is such that the head may turn freely on the ball, without appreciable lost motion. The socket is open on the side toward the pick arm 12 (see Fig. 2) to provide clearance for the neck 19. A suitable grease fitting 23 may be provided, for convenience in lubricating the ball and socket.

It will be noted that the part 21 of the head contains the outer half of the ball-receiving socket and the part 22 contains the other half of the socket. From another point of view, the line 29 marking the joining or juncture of the parts 21 and 22 is contained in a plane which is normal to the axis of the lug strap. Thus, the half-socket in the part 21 comprises a continuous surface engaging the outer side, or substantially the outer half, of the ball 17. Similarly, the half-socket in the part 22 comprises a continuous surface engaging the inner side of the ball 17. Inasmuch as any working stresses in the ball and socket are necessarily transmitted longitudinally of the lug strap, none of such stresses can be transmitted in a direction to force the ball 17 against the joining line 29. In other words, the force exerted by the ball 17 on the connector member is always against one or the other of the continuous surfaces in the parts 21 and 22. The center of the ball and socket being in alignment with the longitudinal axis of lug strap, all of the parts except the neck 19 are subjected to a direct pull.

The particular embodiment of the invention which is above described is simple, substantial, dependable in operation, and inexpensive to manufacture. For these and other reasons, it is being used commercially with remarkable success, particularly on wide looms using heavy shuttles and on high speed looms.

Having fully disclosed the preferred embodiment of my invention, I claim:

1. In a pick motion for fly shuttle looms, the combination of a pick shaft having a pick arm oscillating in a vertical plane, a ball formed integrally with the free end of said arm and offset to one side of the plane thereof, a substantially horizontal lug strap in longitudinal alignment with said ball, and a connector member fixed

to the inner end of said lug strap and having a hollow spherical socket within which said ball is received, said connector member and the center of said ball and socket being in alignment with the longitudinal axis of the lug strap.

2. In a pick motion for fly shuttle looms, the combination of a pick shaft having a pick arm oscillating in a vertical plane, a ball formed integrally with the free end of said arm and offset to one side of the plane thereof, a substantially horizontal lug strap having parallel inwardly extending side runs, a connector member comprising a plate centrally located between said side runs and a head on the inner end of said plate, said head having a hollow spherical socket within which said ball is received, said socket being open on the side toward said arm, and means for clamping said side runs to said plate.

3. In a pick motion for fly shuttle looms, the combination of a pick shaft having a pick arm oscillating widthwise of the loom in a vertical plane, a ball fixed to the free end of said arm and projecting laterally therefrom, a substantially horizontal lug strap longitudinally aligned with the center of said ball, a connector member comprising a plate having a two part head provided with a hollow spherical socket for receiving said ball, said parts of said head each containing half of said socket and said parts being joined in a plane normal to the axis of said lug strap, and means for fixing said plate to the inner end of said lug strap.

4. In a pick motion for fly shuttle looms, the combination of a pick shaft having a pick arm oscillating widthwise of the loom in a vertical plane, a substantially horizontal lug strap positioned to one side of said plane, and a ball and socket connection between the inner end of said lug strap and the free end of said arm, said connection including a ball fixed to the free end of said arm in alignment with the longitudinal axis of said lug strap, and a connector member fixed to the inner end of said lug strap and having a hollow spherical socket within which said ball is received, said connector member consisting of two parts one of which contains the outer half of said socket and the other of which contains the inner half of the socket.

5. In a pick motion for fly shuttle looms, the combination of a pick shaft having an upwardly extending pick arm oscillating widthwise of the loom in a vertical plane, a substantially horizontal lug strap extending widthwise of the loom, said lug strap having parallel inwardly extending side runs, and a ball and socket connection between the inner end of said lug strap and the upper end of said arm, said connection including a ball integrally joined to the upper end of said arm in alignment with the longitudinal axis of said lug strap and a connector member having a plate clamped between the inner ends of said side runs, said connector member having a two part head each part of which contains half of said socket, one of said parts being formed integrally with said plate and comprising the outer half of said socket, and the other part being bolted to the first part and comprising the inner half of the socket.

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