Jan. 6, 1953 W. A. BLANCHARD 2,624,371

LOOM PICKING MECHANISM

Filed Feb. 28, 1951

FIG. 1

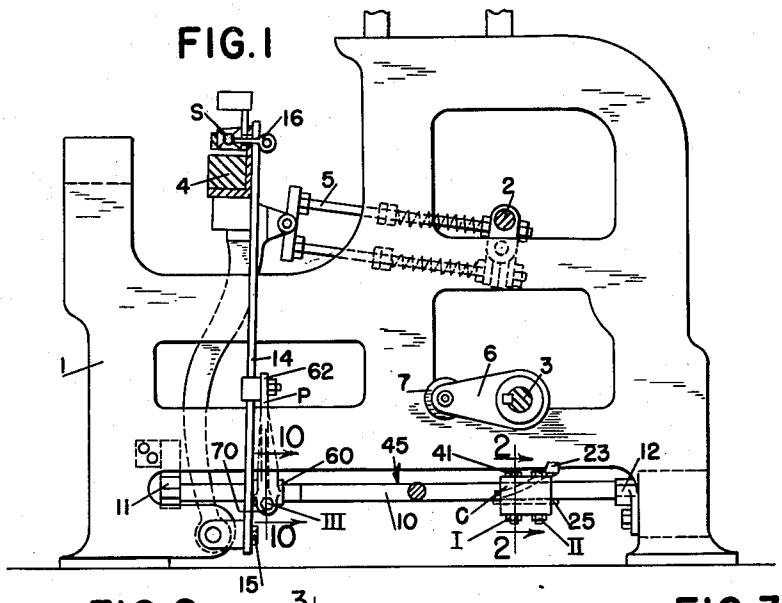


FIG. 2

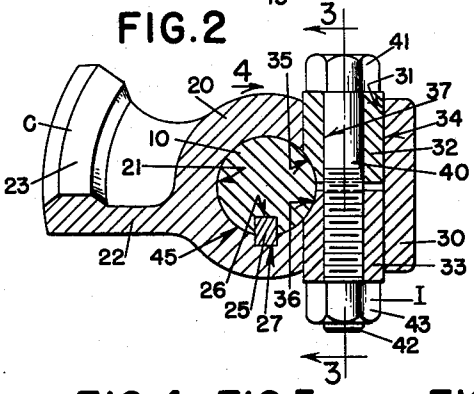


FIG. 3

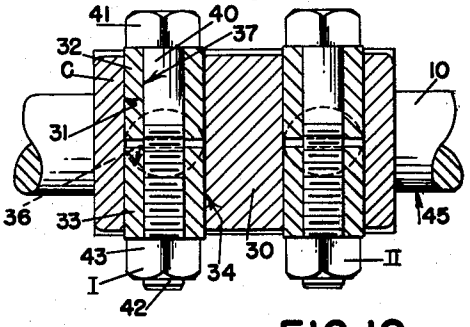


FIG. 4 FIG. 5

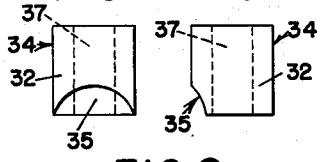


FIG. 6 FIG. 7

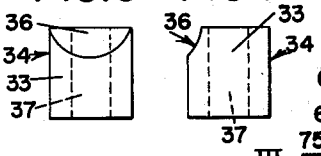


FIG. 10

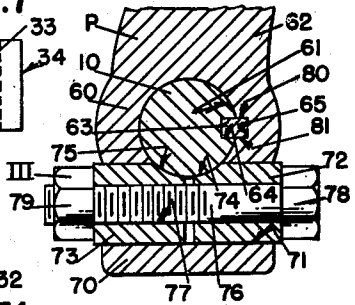


FIG. 8

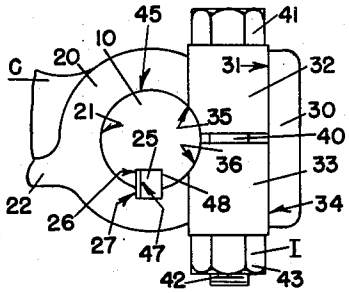
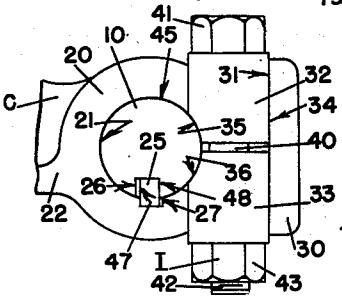


FIG. 9



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LOOM PICKING MECHANISM

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This invention relates to improvements in shuttle picking mechanisms for looms and it is the general object of the invention to provide improved means for holding a picking member, such as a picking cam or power arm, on the picking shaft.

Certain types of picking mechanisms utilize a rockable shaft extending backwardly and forwardly in the loom and having a power arm member secured to it near the forward end and a picking cam member secured to it near the rear end. The power arm member is connected to the sweep stick which in turn is connected to the picker stick which propels the shuttle. A picking arm on the loom bottom shaft rotates during loom operation and engages the picking cam member periodically to rock the shaft.

In the past it has been customary to secure the power arm and picking cam members to the picking shaft by means of set screws which however are likely to slip so that the members lose their setting on the picking shaft. Slippage of the set screws also causes looseness between the picking shaft and the members and increases the likelihood of breakage when the cam member is struck by the picking arm.

It is an important object of the present invention to provide a picking shaft member with clamping means including tubular or sleeve elements which can be drawn tightly into wedging relation with respect to the shaft to hold the member in fixed position on the shaft.

It is customary when employing round picking shafts to provide keys to hold the members in fixed angular position on the shaft, but there is always likely to be some looseness between the key and slots cut for it in both the shaft and the picking members. It is a further object of the invention to locate the aforesaid clamp means on the picking member in such a position as to draw surfaces of the key tightly against member and shaft surfaces through which the picking force is transmitted.

With these and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts hereinafter described and set forth.

In the accompanying drawings, wherein a convenient embodiment of the invention is set forth,

Fig. 1 is a side elevation of a loom partly in section showing a picking shaft with the picking cam and power arm members thereon made according to the present invention,

Fig. 2 is an enlarged vertical section on line 2—2, Fig. 1,

Fig. 3 is a vertical section on line 3—3, Fig. 2,

Fig. 4 is a side elevation of an upper clamping member looking in the direction of arrow 4, Fig. 2,

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Fig. 5 is a front elevation of the clamping member shown in Fig. 4,

Fig. 6 is a view similar to Fig. 4 but shows a lower clamping member,

Fig. 7 is a front elevation of the clamping member shown in Fig. 6,

Fig. 8 is an enlarged diagrammatic view showing the relation between the picking cam member, the picking shaft, the key, and the clamping elements prior to the tightening of the latter,

Fig. 9 is a view similar to Fig. 8 showing the parts after the clamping elements have been tightened and showing the manner in which tightening of the elements takes up lost motion between the picking cam member, the key, and the shaft in the direction in which force is transmitted from the cam member to the shaft, and

Fig. 10 is an enlarged vertical section on line 10—10, Fig. 1, similar to Fig. 2 but showing the invention applied to the power arm member on the picking shaft.

Referring particularly to Fig. 1, the loom frame 1 is provided with top and bottom shafts 2 and 3 and has a lay 4 which is reciprocated backwardly and forwardly by connectors one of which is shown at 5. The loom is ordinarily provided with gearing not shown herein connecting the top and bottom shafts which drive the latter at half the angular speed of the top shaft.

Secured to the bottom shaft 3 is a picking arm 6 having mounted thereon a rotatable roller 7 for engaging a picking shoe or cam member designated generally at C. The cam member is mounted as will be set forth more particularly hereinafter on a horizontal picking shaft 10 preferably circular in cross section and mounted for rocking in front and back bearings 11 and 12 respectively fixed to the loom frame. Secured to the shaft member 10 near the front end thereof in a manner to be described hereinafter is a power member P operatively connected to a picker stick 14 pivoted as at 15 with respect to the lay structure and actuating a picker 16 to propel the shuttle S. There will be a picking shaft at each end of the loom, but since it and the parts connected thereto are similar to the shaft 10 shown in Fig. 1 the latter only will be described in detail.

When applying the present invention to the picking shoe or cam member C the latter will be provided with a hub 20 extending along the shaft 10 and having a primary bore 21 which receives the shaft. Extending laterally from the hub 20, to the left in Fig. 2, is an arm member 22 forming part of the picking mechanism of the loom and having thereon an upwardly facing cam 23 for depression by the roll 7. A key 25 below the axis of shaft 10 extends lengthwise of the latter and fits into a slot 26 cut in the shaft 10 and also into a slot 27 cut in the hub 20. The

cam member C is provided in the present instance with two clamping units I and II. These units are both alike and only one of them, unit I, will be described in detail.

The side of hub 20 opposite to arm 22 has a lateral extension 30 through which extends a vertical transverse or secondary bore 31 cutting across part of and communicating with the primary bore 21. Top and bottom tubular or sleeve wedge elements 32 and 33, respectively, have outer peripheries 34 which fit snugly into the secondary bore 31. The upper tubular element 32 is provided with a downwardly facing wedging surface 35 which may be cut to be concentric with the shaft 10 when the clamping unit is in place, and similarly the tubular element 33 is provided with an upwardly facing wedging surface 36. Surface 35 engages an upper part of the shaft 10 above the axis of the latter, while surface 36 engages a lower part of the shaft below the axis.

The tubular clamping elements 32 and 33 are provided with aligned holes 37 which receive a draw bolt 40 having a head 41 on its upper end and having the lower end thereof screw threaded as at 42 to receive a nut 43. The nut 43 when tightened draws the wedge surfaces 35 and 36 tightly against the periphery 45 of the shaft 10.

After the parts have been made as described the cam member C is fitted over the shaft 10 and the key 25 inserted as suggested in Fig. 2. The tubular elements 32 and 33 are then placed in the bore 31 and the bolt 40 passed through the holes 37. The parts will then be loosely fitted together and may assume positions such as shown in Fig. 8. The nut 43 is then tightened to effect a very close wedging contact between the surfaces 35 and 36 and the shaft. During this tightening operation the tubular clamping elements will exert a force to the right, Fig. 2, against the extension 30 relative to shaft 10 the effect of which will be to draw that part of the hub 20 adjacent to the lower left side 47 of the key against the latter, Fig. 9. At the same time the wedging surfaces 35 and 36 will exert a force on the shaft 10 to the left with respect to the cam member hub tending to move part of the shaft against the right upper side 48 of the key.

When the clamping units are finally tightened the key will assume the relation shown in Fig. 9 with respect to the hub 20 and shaft 10 and the picking force exerted by the cam in a counter-clockwise direction as viewed in Fig. 9 will be transmitted through surface 47 at the lower left hand part of the key, and then through surface 48 on the upper right hand part of the key. The clamp elements hold these surfaces 47 and 48 in close engagement with adjacent parts of the hub and shaft, respectively, and enable these surfaces to transmit the picking force without lost motion. The clamp elements also prevent endwise movement of the cam member along the shaft when roll 7 moves up along cam 23.

When making the present invention available for the power arm member P the latter will be made as shown more particularly in Fig. 10. The power arm member P has a hub 60 made with a primary bore 61 to receive the shaft 10 and has extending from one side thereof an upright arm member 62 forming part of the picking mechanism of the loom. A key 63 at the right of the axis of shaft 10 fits into a slot 64 in the shaft and also into a slot 65 in hub 60.

Hub 60 has an extension 70 on the side thereof opposite the arm 62 through which extends a vertical transverse secondary bore 71 similar to bore 31. This bore communicates with one side of bore 61 and has located in it a clamping unit III similar to units I and II and comprising right and left clamping elements 72 and 73, respectively, having wedge surfaces 74 and 75, respectively, similar to surfaces 35 and 36. A draw bolt 76 extends through aligned holes 77 in the clamping elements 72 and 73 and has a head 78 at one end and a nut 79 at the other end thereof.

The construction of the power arm member is similar to that of the picking arm member so far as the clamping elements are concerned, but the relation between the key and the shaft 10 and hub 60 is different because of the fact that the shaft will supply the picking force to act on the arm 62. The key 63 is located to the right of the shaft 10 and the clamping elements 72 and 73 have the effect of drawing a part of the hub 60 against the right hand upper surface or side 80 of the key when the clamping elements are tightened. During this latter operation part of the shaft is forced against the lower left hand surface or side 81 of the key. When the shaft is turned by the cam it exerts a counter-clockwise force which will pass from the shaft through the surface 81 and from the key through surface 80 to the hub 60. The surfaces 80 and 81 of the key which transmit this force are held tightly against their associated surfaces of the hub and shaft, respectively, by the clamping elements 72 and 73 in a manner similar to that already described in connection with the picking cam member.

From the foregoing it will be seen that the invention provides simple means by which the picking shoe and power arm members may be clamped tightly to a circular picking shaft and be held against endwise shifting therealong. The clamping units include clamp sleeves or elements having wedging or inclined surfaces, such as 35, 36, 74 and 75, which are drawn tightly against the periphery of the shaft. Furthermore, it will be seen that the clamp elements 32 and 33, or 72 and 73, when tightened take up any lost motion which may exist between the associated key and the hub and the shaft in the angular direction in which the picking force is exerted or transmitted. The key 25 is so related with respect to the upwardly facing cam 23 that force derived from the latter passes from hub 20 to the shaft through surfaces of the hub and key and then through surfaces between the key and shaft which are drawn together by the clamping units. A similar transmission of force exists for the power arm member except that in the latter instance the shaft is the source of power. The clamping elements, whether on the cam or power arm member, exert forces which tend to separate the shaft and the part of the hub adjacent to the elements in a direction transverse of the key surfaces through which the forces are transmitted.

Having thus described the invention it will be seen that changes and modifications of the foregoing specific disclosure may be made without departing from the spirit and scope of the invention.

What is claimed as new is:

1. In loom picking mechanism for a loom having a picking arm, a horizontal rockable picking shaft circular in cross section, a picking cam member having a primary bore receiving the picking shaft and having a secondary bore transverse of the primary bore communicating with

the latter, an upwardly facing cam on said member to be depressed by the picking arm and located at one side of the axis of the shaft, clamp means including two aligned clamping elements in the secondary bore of the cam member having wedge surfaces held against the shaft on the side thereof opposite to said cam to prevent endwise movement of the cam member relative to the shaft, and a key connecting the shaft and member intermediate the cam and clamp means.

2. In picking mechanism for a loom having a picking arm, a horizontal rockable picking shaft circular in cross section, a picking cam member having a hub provided with a primary bore receiving said shaft, a picking cam on said member to be depressed by the picking arm located on one side of the axis of said bore, said cam member having a secondary bore transverse of the primary bore communicating with the latter, clamping elements in said transverse bore having wedge surfaces engaging the shaft on the side of said axis opposite to said cam, means drawing said clamping elements into tight holding relation with respect to the shaft and exerting a force in a direction to draw the part of the hub adjacent to the cam toward the clamping elements and urge the shaft away from said elements, and a key connecting the shaft and hub having a side engaging the shaft and having another side engaging the hub, said sides of the key being transverse of said direction of said force.

3. In loom picking mechanism, a horizontal rockable shaft circular in cross section, a picking cam member having a hub fitting said shaft, a cam fixed with respect to said hub located on one side of the axis of the shaft, two vertically aligned clamping elements in the member having wedging edges held against the shaft on the side thereof opposite to the cam, one of said elements engaging the shaft above the axis of the latter and the other element engaging the shaft below said axis to prevent endwise movement of the cam member relative to the shaft, and a key intermediate the cam and clamping elements partly in the cam member and partly in the shaft preventing angular movement of the cam member relative to the shaft.

4. In loom picking mechanism, a rockable shaft circular in cross section, a picking cam member having a hub provided with a primary bore receiving said shaft, a cam fixed with respect to the hub located at one side of the axis of the shaft, said cam member having a secondary bore extending therethrough transverse of and communicating with the primary bore on the side of said axis opposite to the cam, top and bottom clamping sleeve elements in said secondary bore, the top element having a wedge surface to engage the shaft above said axis and the bottom element having another wedge surface to engage the shaft below said axis, and bolt means extending through said sleeve element to draw the latter toward each other and establish tight holding relation between said wedge surfaces and that side of the shaft opposite to the cam.

5. The picking mechanism set forth in claim 4 wherein a key connects the shaft and hub and has surfaces engaging the hub and shaft substantially parallel to said secondary bore.

6. In picking mechanism for a loom having a horizontal rockable cylindrical picking shaft and a picking member thereon, a hub forming part of the picking member provided with a primary bore receiving the shaft, an arm extending from the hub in a direction away from one side of the axis of the shaft forming part of the picking member, said picking member having a secondary bore extending therethrough transverse of and communicating with the primary bore, aligned clamping sleeve elements in said secondary bore each having a wedge surface engaging said shaft on the side of said axis opposite to said arm, one of said wedge surfaces engaging an upper part of the shaft above said axis and the other wedge surface engaging a lower part of the shaft below said axis, and a draw bolt extending through said sleeve elements establishing tight holding relation between said wedging surfaces and the shaft on the side of the latter opposite to said arm.

7. The structure set forth in claim 6 wherein said wedging surfaces exert a force in a direction tending to separate that part of the picking member containing said secondary bore from the shaft, and a key connecting the shaft and the hub having shaft and hub engaging surface transverse of the direction in which said force is exerted.

8. In picking mechanism for a loom, a cylindrical picking shaft member, an arm member forming part of the loom picking mechanism, one of said members exerting the picking force and the other member having said picking force exerted thereon, a hub connected at one side thereof with the arm member and having a primary bore therethrough receiving the shaft member, the hub having a secondary bore therethrough transverse of and communicating with the primary bore and located at the side of the hub opposite to said arm member, tubular clamping elements in the secondary bore each having a wedge surface engaging the shaft on the side of the latter opposite to said arm member, a draw bolt extending through the clamping elements forcing said wedge surfaces against said shaft and tending to cause said wedge surfaces to move that part of the hub in which the secondary bore is located in a direction away from the shaft, and a key partly in the shaft and partly in said hub having a surface on one side thereof transverse of said direction against which part of the hub is drawn by said force and having another surface transverse of said direction on the opposite side thereof against which part of the shaft is urged by said force.

9. In picking mechanism for a loom, a cylindrical picking shaft member, an arm member forming part of the loom picking mechanism, one of said members exerting a picking force in a given angular direction around the axis of said shaft member during a picking operation and the other member having said force exerted thereon, a hub connected to said arm member and having a primary bore therethrough receiving said shaft member, the hub having a secondary bore therethrough transverse of and communicating with the primary bore, aligned tubular clamping elements in said secondary bore having wedge surfaces held in tight holding relation with said shaft member, and a key partly in the shaft member and partly in the hub having a surface on one side thereof engaging the shaft member and another surface on the opposite side thereof engaging the hub, said surfaces being beyond said clamping elements with reference to the direction in which said picking force is exerted.

10. In picking mechanism for a loom, a cylindrical picking shaft member, an arm member forming part of the loom picking mechanism,

one of said members exerting a picking force in a given angular direction around the axis of said shaft member during a picking operation and the other member having said force exerted theron, a hub connected at one side of said axis to said arm member and having a primary bore therethrough receiving said shaft member, the hub having a secondary bore therethrough transverse of and communicating with the primary bore and on the side of the latter opposite to said arm member, aligned tubular clamping elements in said secondary bore having wedge surfaces held in tight holding relation with said shaft member, and a key partly in the shaft member and partly in the hub having a surface on one side thereof engaging the shaft member and another surface on the opposite side thereof engaging the hub, said surfaces being beyond said clamping elements with reference to the direction in which said picking force is exerted.

11. In picking mechanism for a loom, a cylindrical picking shaft, a power member on the shaft including an arm, a hub connected at one side thereof with said arm and having a primary bore therethrough receiving the shaft, the hub having a secondary bore therethrough transverse of and communicating with the primary bore and located at the side of the hub opposite to said

arm, tubular clamping elements in the secondary bore each having a wedge surface engaging the shaft on the side of the latter opposite to said arm, a draw bolt extending through the clamping elements forcing said wedge surfaces against said shaft and causing said wedge surfaces to exert a force in a direction to move that part of the hub in which the secondary bore is located away from the shaft, and a key partly in the shaft and partly in said hub having a surface on one side thereof transverse of said direction against which part of the hub is drawn by said force and having another surface transverse of said direction on the opposite side thereof against which part of the shaft is urged by said force.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,447,795	Brouwer et al.	Aug. 24, 1948
2,491,916	Blanchard	Dec. 20, 1949
2,564,747	Blanchard	Aug. 21, 1951
2,564,748	Blanchard	Aug. 21, 1951
2,575,456	Mastriani et al.	Nov. 20, 1951