Nov. 3, 1964 F. H. KAUFMANN 3,155,118

LOOM HARNESS

Filed April 9, 1963

FIG. 1

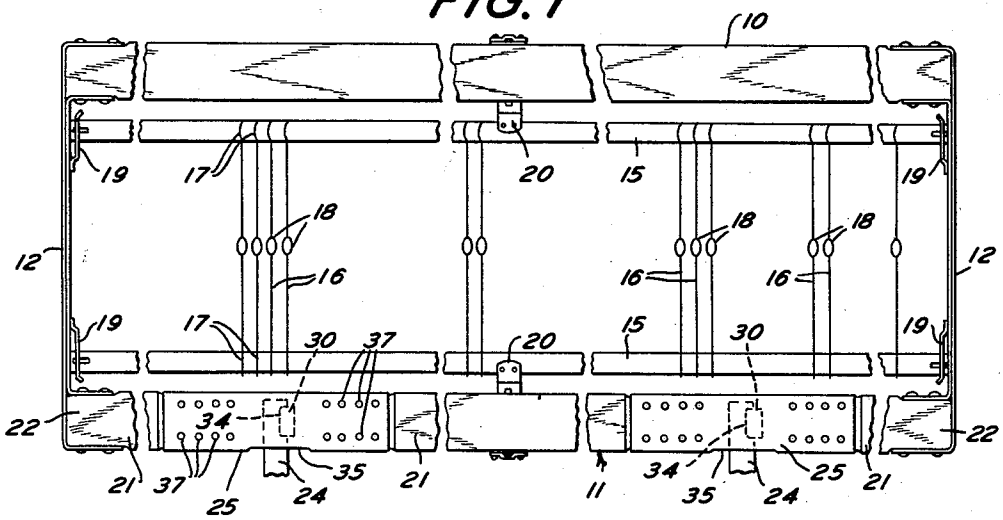


FIG. 2

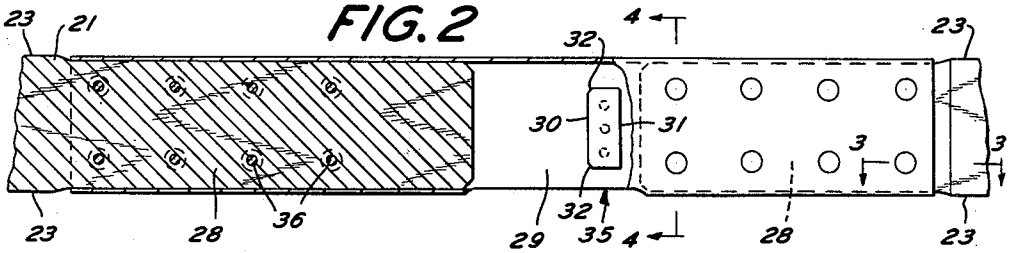
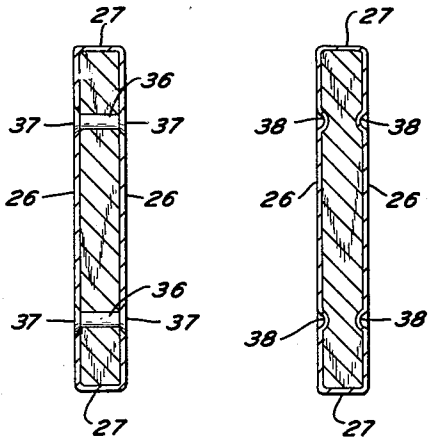


FIG. 4



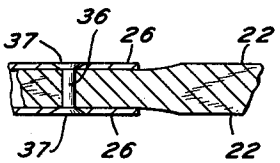


FIG. 3

FIG. 5

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LOOM HARNESS

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This invention relates to loom harness for weaving and more particularly to heddle frames for the mounting of heddles to separate the warp ends into successive sheds for the passage of the shuttle therebetween and in which the harness frames are actuated from below.

It has heretofore been conventional practice in other types of looms and particularly those in which the heddle frames are lifted by straps connected to the top rails, to make the top and bottom rails of wood. Such rails, in heddle frames have a number of advantageous characteristics, including relatively quiet operation, adequate strength, a limited degree of resilience and particularly relatively light weight. Difficulties have been encountered, however, in attaching the push rods or lifters since the openings required for the attachment of such push rods or lifters greatly weaken the rails and to an extent that wooden rails have not been satisfactory.

It has heretofore been proposed to make heddle frames, of the type actuated from below, of steel. Such frames are, of course, very heavy. Heddle rails of steel have not proven satisfactory at high speeds and with heavy warps. Failures occurred in the rails due to fatigue at the locations intermediate the ends where the heddle rods were supported.

It has also heretofore been proposed to make heddle frames having top and bottom rails of extruded shapes of light metal alloys of low specific weight, such as those of aluminum and magnesium. Such heddle frames, particularly in longer lengths, were of adequate strength but the weight was an undesirable characteristic adding to the power requirements and to the necessity for heavier and stronger designs to accommodate the weight.

It is the principal object of the present invention to provide an improved heddle frame in which the top and bottom rails can, if desired, be composed of wood but with provisions for the attachment of the push rods in a manner which does not sacrifice the strength of the rail.

It is a further object of the present invention to provide an improved heddle frame in which provisions are made for retaining to the greatest possible extent the advantages of wooden rails together with interior provisions for the attachment of the push rod.

It is a further object of the present invention to provide a heddle frame having an improved rail with wooden and metal components in which the advantages of the wooden rail are retained.

It is a further object of the present invention to provide a heddle frame having wooden rails with simple but effective attaching means for actuating push rods.

Other objects and advantageous features of the invention will be apparent from the description and claims.

The nature and characteristic features of the invention will be more readily understood from the following description taken in connection with the accompanying drawings forming part thereof, in which:

FIGURE 1 is a front elevational view of a heddle frame in accordance with the invention;

FIG. 2 is a fragmentary view enlarged, partly in elevation and partly in vertical section of one of the rails;

FIG. 3 is a fragmentary horizontal sectional view, enlarged, and taken approximately on the line 3—3 of FIG. 2;

FIG. 4 is a vertical sectional view, enlarged, taken approximately on the line 4—4 of FIG. 3; and

FIG. 5 is a view similar to FIG. 4 illustrating another

form of interconnection between the rail and one of the inserts.

It should, of course, be understood that the description and drawings herein are illustrative merely, and that various modifications and changes can be made in the structure disclosed without departing from the spirit of the invention.

Referring now more particularly to the drawings the top and bottom rails or shafts 10 and 11 of the harness frame are shown as connected at their ends by side struts 12 of any preferred construction.

The top rail 10 can be of any desired material and while preferably of wood can be made of a hollow extruded shape.

Spaced from the top and bottom rails 10 and 11 heddle rods 15 are provided having heddles 16 mounted thereon by means of end eyes 17. The heddles 16 at their central portions can have the usual warp eyes 18. The rods 15 can be supported at their ends by spring hooks 19, of any preferred type, and intermediate their ends by brackets 20, commonly called "hooks," of any preferred type.

Referring now more particularly to FIGS. 2, 3 and 4 of the drawings, the bottom rail 11, in accordance with the invention, preferably includes wooden rail sections 21, longitudinally axially aligned and with their opposite flat front and rear faces 22 disposed in spaced parallel vertical planes and with their opposite flat top and bottom faces 23 in spaced parallel horizontal planes. The rail sections 21 at their ends can have the side struts 12 secured thereto in the conventional manner.

Interposed between the aligned outer rail sections 21 and at each location where a vertically disposed operating member 24 is employed, and in overlapping relation to the ends of the sections 21, hollow rectangular connectors 25 are provided.

The connectors 25 are preferably formed of seamless tubing shaped to provide opposite spaced parallel vertical front and rear walls 26, the extensions of which are aligned with the faces 22 and opposite flat top and bottom walls 27, the extensions of which are aligned with the faces 23.

The wooden rail sections 21 in order to be overlapped or telescoped within the connectors 25 have their ends 28 reduced in size vertically and horizontally to an extent to permit of a force fit at these locations.

Between the ends 28 of the rail sections 21 a space 29 is provided within which an actuator block 30 is mounted. The block 30 is vertically elongated in shape and is secured to the opposite front and rear walls 26 in any desired manner such as by welding at 31. The block 30 can have chamfered corners 32 to facilitate the assembly thereto of the operating member 24 which has a complemental socket 34 for this purpose.

The space 29, along the lower margin, has an opening 35 which receives the upper end of the operating member 24.

The rail sections 21 and the connectors 25 can be retained in assembled relation in any suitable manner. One preferred construction for this purpose, shown in FIGS. 1 to 4, inclusive, includes a plurality of rivets 36 with their beveled heads 37 flush with the outer faces of the walls 26.

Another preferred form of retaining construction is shown in FIG. 5, in which a plurality of struck in portions 38 are provided oppositely located on the walls 26 to permanently deform both of the walls 26 and the rail sections 21 and to compress the material of the rail sections 21 at the places of application of the struck in portions 37.

I claim:

1. In a heddle frame having a top and a bottom rail

with front and rear faces of the rails in common spaced planes and end struts connecting said rails, said bottom rail comprising a plurality of aligned wooden sections with contiguous ends at locations intermediate the ends of said bottom rail separated to provide a space and connectors at said spaces between adjoining pairs of ends of said wooden sections, said connectors and said wooden sections being in overlapped relation, members for retaining said connectors and said wooden sections in secured relation, said connectors between said wooden section ends having an access opening along one margin thereof, and an actuator member in said space and secured to said connector to transmit motion to said frame.

2. A heddle frame as defined in claim 1 in which said connectors are rectangular continuous tubular members.

3. A heddle frame as defined in claim 1 in which said members for retaining said connectors and said wooden sections in secured relation comprise rivets extending through said wooden sections having their ends flush with planes along the front and rear faces of the wooden sections.

4. A heddle frame as defined in claim 1 in which said members for retaining said connectors and said wooden sections in secured relation comprise struck in portions of said connectors engaging said wooden sections.

5. A heddle frame as defined in claim 1 in which said conectors are continuous rectangular tubular members, and the actuator member comprises a block.

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