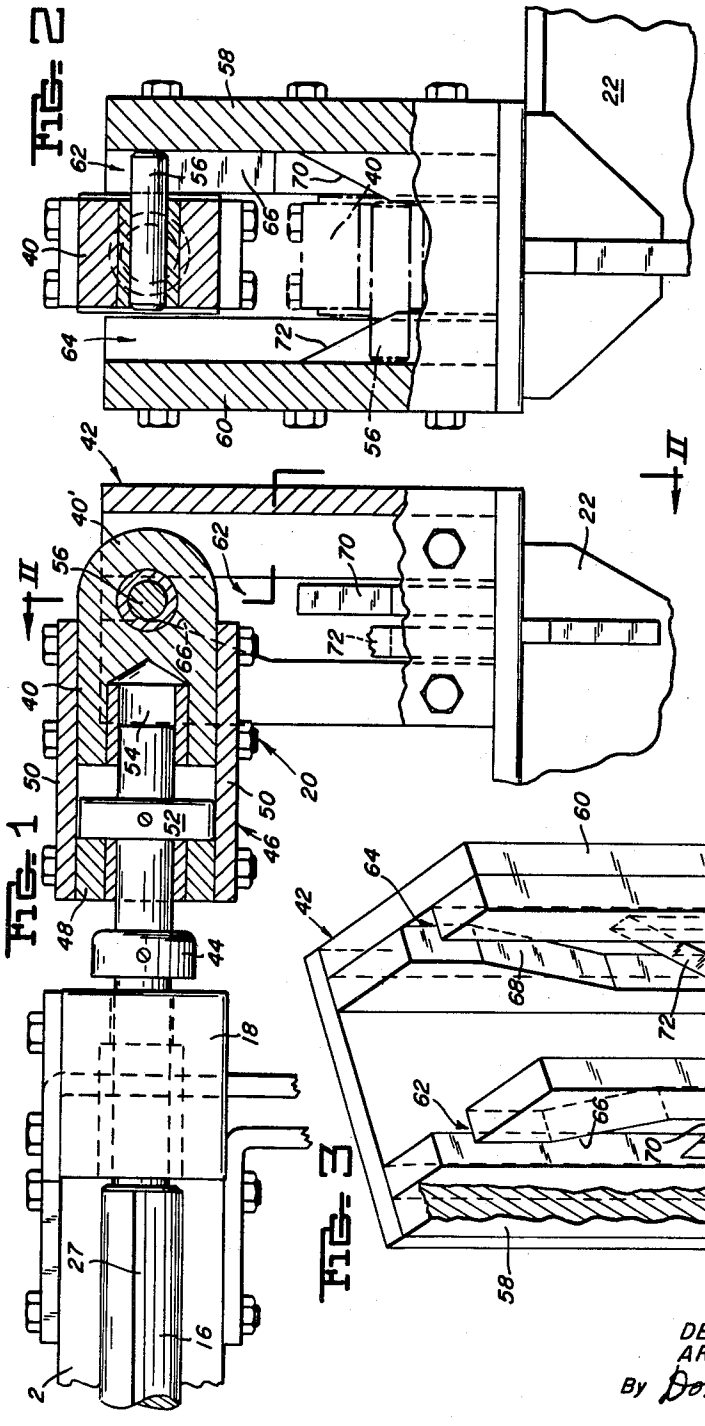
Oct. 15, 1963 D. W. BREWER ETAL 3,106,848

MOTION TRANSLATING DEVICE

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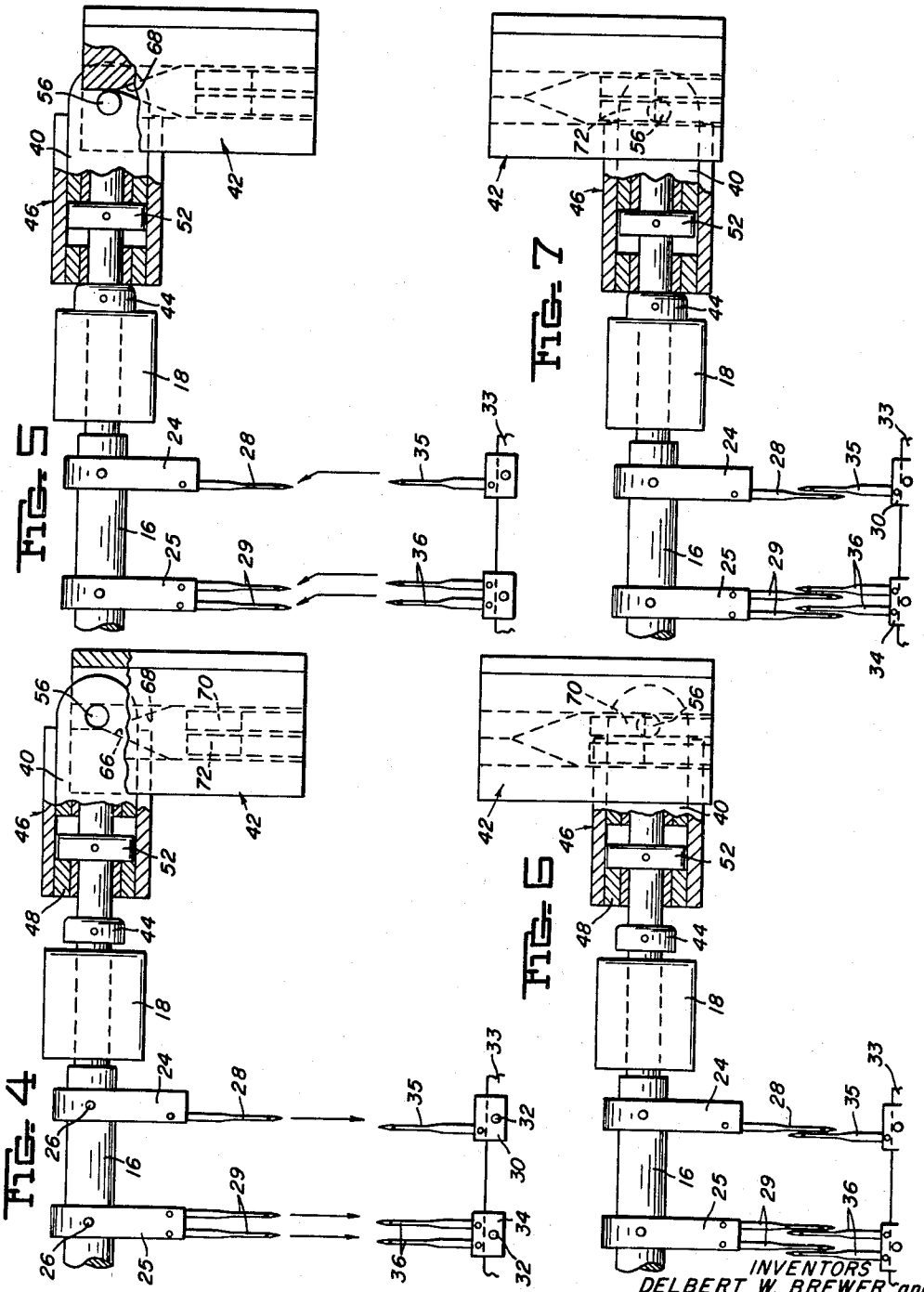


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MOTION TRANSLATING DEVICE

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The present invention relates generally to the art of translating motion and more particularly has as its primary object the provision of an improved motion translating device whereby a vertically reciprocating shaft can be made to oscillate axially in a horizontal plane.

Although not restricted thereto, the device of our invention is especially suitable for use in conjunction with wire screen cloth weaving looms of the general type shown in Harter Patent No. 2,421,261 provided with an oscillating heddle-needle shaft for forming selvages as described hereinafter.

In the operation of a loom of the type disclosed by Harter Patent No. 2,421,261 to produce wire screen cloth, warp or line wires are introduced to the loom in substantial parallelism from a supply source by feed rolls and passed alternately through vertically disposed heddle wires mounted in a pair of vertically reciprocable front and rear heddle frames which effect a warp shed to provide for the admission of weft or picket wires. The weft wires are introduced into the bite of the warp wires by pinch rolls and are guided and positioned in the fabric by a beater frame and reed assembly. The cloth thus woven is subsequently processed on the loom to provide outer selvages thereon.

For economic reasons it is desirable to form the selvages in wire screen cloth during weaving. Also, for many purposes it is desirable to form intermediate as well as outer selvages in the cloth during weaving so that the cloth can later be slit into narrower widths each having finished edges that will not unravel.

The invention will be fully apparent from the following detailed disclosure and the appended claims when read in connection with the accompanying drawings in which:

FIGURE 1 is an elevational view partly in section of the motion translating device of the invention shown in conjunction with an oscillatable shaft of a wire cloth weaving loom;

FIGURE 2 is a vertical sectional view taken along the line II—II of FIGURE 1;

FIGURE 3 is a perspective view showing the camming surfaces of the motion translating device; and

FIGURES 4, 5, 6 and 7 are schematic views showing the sequence of operation of the apparatus of the invention.

Before proceeding with a detailed description of the apparatus of our invention it will be understood that a typical wire screen cloth weaving loom suitable for installation of the apparatus of our invention thereon is shown and described in detail by the above-mentioned Harter Patent No. 2,421,261 and, therefore, the apparatus of our invention will be hereinafter described in conjunction with such a loom.

Referring more particularly to the drawings, the motion translating device of the invention, designated generally by reference numeral 20, is shown in use for oscillating a shaft mounted on the front heddle frame of a "Harter" type wire screen cloth weaving loom. It is to be understood the motion translating device of the invention is not restricted to such use but may be used effectively in other application where motion translating is desired.

Details of the loom itself will be shown and described

hereinafter only to the extent necessary for a clear understanding of the device of the invention.

Reference numeral 2 designates a front heddle frame mounted for vertically reciprocating movement in the wire screen cloth weaving loom. A shaft 16 is mounted for axially oscillating movement on the upper part of the front heddle frame 2 in spaced bearings 18, one of which is shown at one end of the frame 2. The shaft 16 is connected with and oscillated by the motion translating device 20 of the invention which is mounted on a bracket 22 attached to one side of the loom.

An outer heddle-needle holder 24 is adjustably mounted on the shaft 16 adjacent one end thereof by means of a set screw 26 and an intermediate heddle-needle holder 25 is similarly adjustably mounted on the shaft 16 intermediate the ends thereof. An axial groove 27 extends along the shaft 16 for receiving the ends of the set screws 26 and thus prevent rotation of the needle holders 24 and 25 relative to the shaft. Needle holder 24 carries a single heddle needle 28 while needle holder 25 carries a pair of spaced heddle needles 29. Heddle needles 28 and 29 extend downwardly and normal to the shaft 16 and each carries a warp wire (not shown).

An outer heddle-needle holder 30 is adjustably mounted by a set screw 32 on a longitudinally extending angle bar 33 rigidly affixed of the bottom of the rear heddle frame (not shown) of the loom. An intermediate heddle-needle holder 34 is similarly adjustably mounted on the angle bar 33 intermediate the ends thereof. Holder 30 carries a single heddle needle 35 and holder 34 carries a pair of spaced heddle needles 36. Needles 35 and 36 extend upwardly from their respective holders. The heddle needles each carry a warp wire (not shown) which form selvages in the fabric woven on the loom. During operation of the loom, as the front and rear heddle frames reciprocate vertically, the shaft 16 is oscillated axially by the motion translating device 20 of the invention which will now be described in detail.

The motion translating device 20 includes a drive block 40 slidably mounted on the end of the shaft 16 and fitted for generally vertical movement in a box 42 mounted on the bracket 22. A collar 44 is rigidly mounted on the end of shaft 16 spaced outwardly of the bearing 18 to limit axial movement of the shaft. A sleeve 46 encloses the major portion of the drive block 40 and the adjacent end portion of the shaft 16. The sleeve 46 includes a forward wall 48 spaced from the collar 44 and top and bottom plates 50 which connect the forward wall 48 in spaced relation with the drive block 40. A rectangular slide block 52 rigidly attached to the shaft 16 is slidably mounted for axial movement in the space between the drive block 40 and the forward wall 48. The end of shaft 16 is slidably received in an opening 54 in the inner end of the drive block 40, as best shown in FIGURE 1. The end 40' of the drive block 40 remote from the shaft 16 projects outwardly from the top and bottom plates 50 and carries a transversely disposed pin 56 slidable therein. The length of the pin 56 is greater than the width of the drive block 40 so that one end thereof always projects from one side or the other of the drive block. The projecting end portion 40' of the drive block 40 and the adjacent end of the sleeve 46 are disposed between opposite side walls 58 and 60 of the box 42.

The inner faces of the side walls 58 and 60 are provided with vertical slots 62 and 64, respectively, which are adapted to be traversed by the ends of the pin 56. The upper portion of slot 62 is inclined to the right, as viewed in FIGURE 1, on one side 66 and is straight on its other side. As best shown in FIGURE 3, the upper portion of slot 64 on one side 68 is inclined in the direction opposite to the direction of inclination of the side

66 of slot 62, and is straight on its other side. Slot 62 is provided with an inclined or wedge surface 70 in its bottom portion adjacent to the straight side thereof. Slot 64 is provided with a similar inclined or wedge surface 72 in its bottom portion adjacent its straight side. It will be noted that the wedge surfaces 70 and 72 are narrower than the width of the bottom portions of the slots 62 and 64, respectively. It will also be noted that the wedge surface 70 is not directly opposite wedge surface 72. Wedge surface 70 is disposed opposite the open bottom portion of slot 64 and wedge surface 72 is disposed opposite the open bottom portion of slot 62, for a purpose which will become apparent.

The sequence of operation in forming twisted selvages during the weaving of the wire screen cloth is shown diagrammatically by FIGURES 4, 5, 6 and 7. In order to form the twisted selvages it is necessary to laterally move heddle frames 28 and 29 alternately from one side to the other of heddle needles 35 and 36 as the front and rear heddle frames are reciprocated vertically. Lateral shifting of the heddle needles 28 and 29 is achieved by axially oscillating the shaft 16 as the front heddle frame is moved upwardly in the weaving operation of the loom. Shaft 16 is oscillated by operation of the motion translating device of the invention as described hereinafter.

When the heddle needles are in the relative positions shown in FIGURE 4, the projecting portion 40' of the driving block 40 and the adjacent end of the sheave 46 are disposed in the top of the box 42 with the end of pin 56 projecting into the top portion of the slot 62. Then, as the heddle needles are vertically shifted to the relative positions shown in FIGURE 5 during the next step in the sequence of operation, the driving block 40 and sleeve 46 travel downwardly toward the bottom of the box 42. As the block 40 thus travels downwardly, the end of the pin 56 engages the wedge surface 70 and is shifted transversely so that its end is projected into the bottom portion of slot 64. During the next step in the sequence of operation to the position shown by FIGURE 6, the driving block 40 and sleeve 46 travel upwardly in the box 42 with the end of pin 56 traversing the slot 64. As the end of pin 56 travels upwardly in slot 64, it engages the inclined side 68 of the upper portion of slot 64. As the end of pin 56 travels upwardly along the inclined side 68, the driving block 40 and sleeve 46 are shifted to the left causing the slide block 52 to be engaged by the inner end of the drive block 40 to thus cause axial shifting of the shaft 16 and heddle needles 28 and 29 to the left.

During the next stage of operation to the position shown in FIGURE 7, the drive block 40 and sleeve 46 travel downwardly toward the bottom of box 42 with the end of pin 56 traversing the slot 64. As pin 56 travels downwardly in slot 64 its projecting end engages the wedge surface 72 and the pin is shifted transversely and its opposite end is projected into slot 62.

As the heddle frames are next reciprocated to the position represented by FIGURE 4, the drive block 40 and sleeve 46 travel upwardly in the box 42 with the projecting end of pin 56 traversing slot 62. As the upper portion of slot 62 is approached, the projecting end of pin 56 engages the inclined surface 66 and the drive block 40 and sleeve 46 are shifted to the right. As the sleeve

46 shifts to the right, the slide block 52 is engaged by the forward wall 48 of sleeve 46 and is moved to the right. Movement of slide block 52 to the right causes the shaft 16, to which the block 52 is pinned, to move axially to the right and the heddle needles 28 and 29 carried by shaft 16 to shift laterally to the right.

Thus, the shaft 16 is axially shifted alternately to the right or left by the motion translating device of the invention each time the front heddle frame 2 is raised in the cloth weaving operation of the loom. Such shifting of the shaft 16 causes the heddle needles 28 and 29 to shift laterally to the right or left relative to the non-shifting heddle needles 35 and 36 and achieves twisting of the warp wires carried by the heddle needles 28 and 29 about the warp wires carried by heddle needles 35 and 36 to form outer and intermediate selvages in the cloth as it is woven.

While one embodiment of our invention has been shown and described it will be apparent that other adaptations and modifications may be made without departing from the scope of the following claims.

We claim:

1. The combination with a reciprocable frame, and a shaft mounted for axial movement on said frame, of spaced walls between which one end of said shaft projects and a pin having a length greater than the diameter of the shaft slidable transversely through said end, said walls having slots therein extending in the direction of movement of said reciprocable frame, said slots being adapted to be traversed by the ends of said pin, one slot having an inclined portion in one side adjacent one end tending to move said pin and shaft in one direction, the other slot having an inclined portion in the other side adjacent the same end as the said one slot, the inclined portion in said other slot tending to move said pin and shaft in the other direction, and wedges in the bottoms of said slots adjacent their other ends effective alternately to shift said pin back and forth through said shaft as said frame reciprocates.

2. A motion translating device comprising a pair of spaced parallel plates, the opposing faces of said plates each having a slot therein, one end of one of said slots being inclined forwardly on one side and substantially straight on the other side and the corresponding end of the opposite slot being inclined rearwardly on one side and substantially straight on the other side, an inclined surface in the bottom portion of each of said slots adjacent to the straight side thereof, a shaft having one end disposed for movement longitudinally between said plates, a transversely extending pin slidably mounted in said one end of said shaft, the length of said pin being greater than the width of said shaft, said pin being adapted to project alternately from one side or the other of said shaft and travel along the inclined portion of one of said slots when said shaft is moved toward said one end of said slots, and along said straight side of said one of said slots and then along said inclined surface in said one of said slots when the shaft is moved in the opposite direction whereby said pin is moved laterally relative to said shaft and its end projected into the other one of said slots.

No references cited.