Aug. 29, 1933. W. C. HOWE ET AL 1,924,208

WARP STOP MOTION

Filed Feb. 6, 1931

FIG. 1

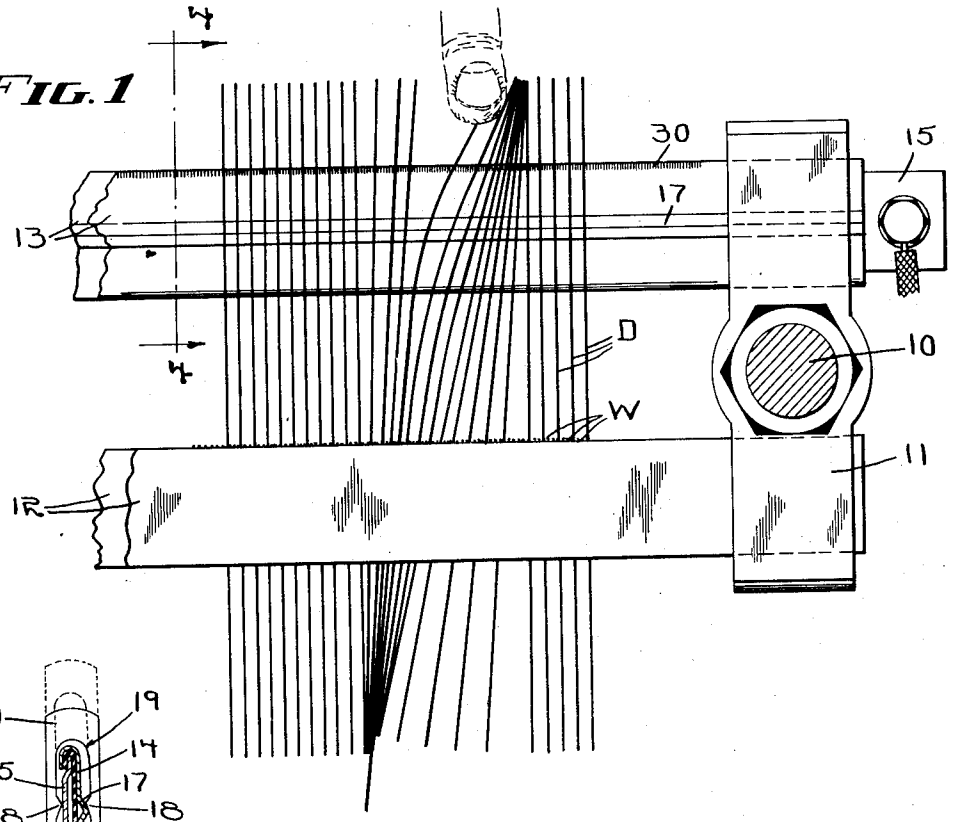
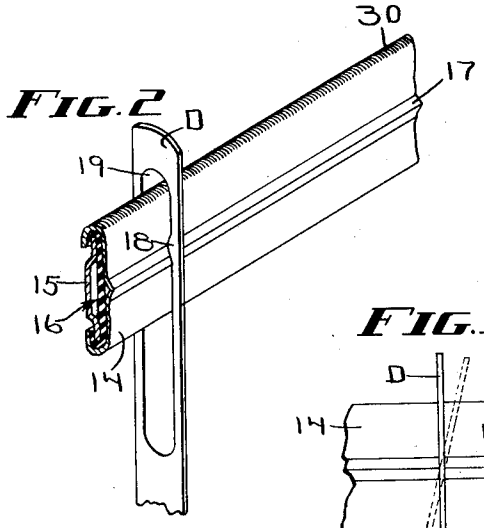


FIG. 4

FIG. 2



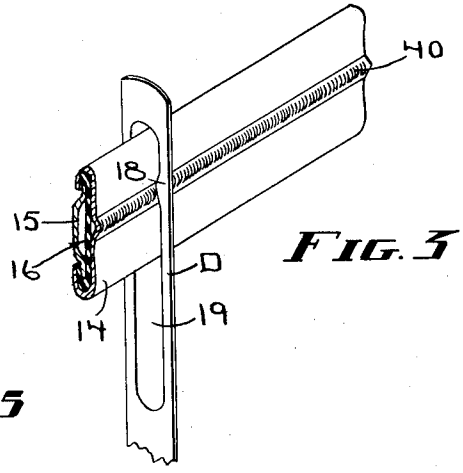
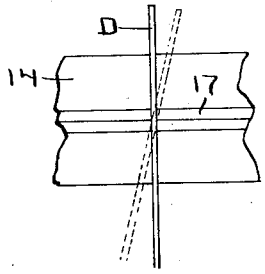


FIG. 3

FIG. 5



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WARP STOP MOTION

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13 Claims. (Cl. 139—351)

This invention relates to improvements in warp stop motions having bars which extend through slots in drop wires and it is the general object of the invention to facilitate the finding of a broken warp thread in such a motion.

In certain forms of warp stop motions the drop wires have longitudinal slots in their upper portions through which extend contact bars. In electrical motions there is ordinarily no relative movement of the parts of the bars nor are the bars themselves moved as a unit to indicate the location of the fallen drop. It is an important object of our invention to provide these bars with roughened or knurled parts which will contact with a drop wire in lowered position so as to arrest movement thereof longitudinally of the bar when such movement is induced by the weaver.

In one form of our invention we employ a contact bar having a longitudinal rib to coact with an inwardly projecting cam on the drop wire, and provide this rib with corrugations so that when the drop wire is in down position the projection will contact with the corrugated part of the rib and resist endwise movement, thereby indicating its location. In another form of our invention the corrugations are placed on the top of the bar where they will engage the upper end of the slot in the fallen drop wire and resist movement of the latter. Because of the fact that the drop wire must close a circuit when it falls there is necessarily a gap between the upper knurled edge of the bar and the top of the slot, but this space is very small and a slight tilting of the drop wire about the rib as a pivot will bring the top of the slot into engagement with the knurled edge to prevent sidewise movement.

Another feature of the invention relates to the rib on the bar and the corresponding projections on the drop wire. When a wire is held in normal raised position by its thread the latter becomes the pivot around which the wire swings when moved by the weaver's hand. The resulting large arc of movement tends to keep the raised wire from contacting with the top of the bar. When the wire falls, however, its projections and rib on the bar become the pivot and the radius of turning is greatly reduced, tending to cause engagement between the top of the bar and wire with relatively small movement on the part of the latter. This facilitates finding of the fallen drop wire.

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

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

Fig. 1 is a rear elevation of a portion of a warp stop motion having the preferred form of our invention and showing the manner of separating the drop wires, the support being shown in section,

Fig. 2 is a perspective view showing the preferred form of contact bar,

Fig. 3 is a view similar to Fig. 2 but showing a modified form of bar,

Fig. 4 is a cross section on line 4—4 and showing a drop wire in fallen position, and

Fig. 5 is a detailed view showing a portion of a contact bar and the manner in which the rib serves as a pivot for the fallen drop wire.

Referring to Fig. 1, we have shown a supporting bar 10 on which is mounted a holder 11 supporting a series of lower separator bars 12 which act to space the lower ends of the metallic drop wires D of different banks. The upper parts of the holders space the detector bars 13.

The bars are formed of an outer inclosing sheath member 14 grounded by contact with the support lever, and also an inner insulated electrode 15 which is held out of contact with the outer member by means of insulation designated at 16, in Fig. 4. The sheath is provided with a rib 17 adapted to coact with one of a pair of integral projections 18 extending into a slot 19 formed in the upper end of the drop wire D.

Under normal conditions the warp threads W support the drop wires in the raised position shown in dotted lines, in Fig. 4, with the projections 18 above the rib 17. When a warp thread breaks or becomes unduly slack the drop wire corresponding thereto will fall so that one of the projections 18 will engage the rib and act to move the drop wire laterally so that the opposite projection will have contact with the plate 15. When this latter condition exists the two bars will be connected through the metallic drop wire and a circuit not set forth herein will effect loom stoppage.

In carrying our present invention into effect we aim to provide means whereby the location of the fallen drop wire may be readily ascertained, and in the preferred form of our invention we provide the upper turned over part of the contact bar 14 with a knurled or roughened surface 30. The effect of the knurling is to provide a series of transverse grooves which will act to receive the top of the slot of a fallen drop wire and prevent

further movement thereof along the bar. When the loom has been stopped because of a warp fault the weaver will run his hand over the drop wires as indicated in Fig. 1, pressing the drop wires down so that they assume an inclined position. As indicated in Fig. 5 this action will result in moving a vertical drop wire from the position shown in full lines to that shown in dotted lines.

All of the wires corresponding to the unbroken warp threads will swing around their warp threads as pivots and these ends will therefore describe relatively large arcs. The drop wire which corresponds to the broken thread, however, is in fallen position as indicated in full lines in Fig. 4 and the projections 18 thereof will engage the rib and contact electrode 15, and these points becoming the pivot around which the top of the fallen drop wire moves. Because of the fact that the rib and electrode 15 are spaced considerably above the sheet of warp threads the radius around which the fallen drop wire moves is considerably reduced and it therefore more quickly comes into contact with the knurled surface 30. It is found in practice that the tendency of the fallen drop wire along the bar is arrested because of the fact that the top of the slot 19 is in engagement with one of the transverse grooves resulting from the knurling of the top of the bar. It is to be understood from an inspection of Fig. 4 that the top of said slot is in close proximity to the knurled surface when the drop wire is down.

In the modified form of the invention we place the knurled surface 40 on the rib where it will become engaged with one of the projections 18 and thereby resist movement along the bar. With this form of the invention the weaver will follow the same procedure as with the preferred form, and the upper part of the fallen drop wire will turn around the rib as a center so that the top of the slot will engage the rounded upper surface of the outer contact member 14 to resist further movement on the part of the weaver's hand.

From the foregoing it will be seen that we have provided a very simple means for assisting a weaver to determine the location of a fallen drop wire, this means including a rib formed on the contact bar so as to require the upper end of the drop wire to swing around a relatively short radius and thereby quickly bring the top of the slot into engagement with a resisting surface of the contact bar. In each form this action takes place but in the preferred form the roughened surface is placed at the top of the bar while in the modified form the roughened surface is placed on the rib. The procedure of finding the fallen drop is facilitated by the fact that the major part of the drop wires will swing around a relatively long radius whereas the fallen drop wire is caused to swing around the short radius.

Having thus described our invention it will be seen that changes and modifications may be made therein by those skilled in the art without departing from the spirit and scope of the invention and we do not wish to be limited to the details herein disclosed, but what we claim is:

1. In a warp stop motion, a bar extending transversely of the warp threads, a bank of drop wires, each wire having a slot therein through which the bar extends, and said bar having a roughened surface at its upper edge ineffective to restrain movement of a raised drop wire along the bar but positioned to engage a fallen drop wire and resist movement thereof along the bar.

2. In a warp stop motion, a bar extending transversely of the warp threads, a bank of drop wires, each wire having a slot therein and a projection extending into the slot, a rib on the bar normally below and out of contact with the projections, and a roughened surface on the bar out of contact with the drop wire when the bar is centrally disposed relatively to the slot of a drop wire in normal position, a fallen drop wire engaging the roughened surface and being resisted thereby in movement along the bar.

3. In a warp stop motion, a bar extending transversely of the warp threads and having an upper surface and a longitudinal projecting surface therebelow, a bank of drop wires, each wire having a slot the top of which is normally spaced from the upper surface and each drop wire having a projection extending into the slot below the top of the latter, one of said surfaces being roughened, the projection of a fallen drop wire engaging the projecting surface to cause the top of the slot to move into engagement with the upper bar surface when the fallen wire is inclined toward the bar, the roughened surface resisting movement of the drop wire along the bar when the wire is inclined and in engagement with both surfaces.

4. In a warp stop motion, a bar extending transversely of the warp threads and having an upper surface and a longitudinal projecting surface therebelow, a bank of drop wires, each wire having a slot the top of which is normally spaced from the upper surface and each drop wire having a projection extending into the slot below the top of the latter, the upper surface being roughened, the projection of a fallen drop wire engaging the projecting surface to cause the top of the slot to move into engagement with the upper bar surface when the fallen wire is inclined toward the bar, the roughened surface resisting movement of the drop wire along the bar when the wire is inclined and in engagement with both surfaces.

5. In a warp stop motion, a bar extending transversely of the warp threads and having an upper surface and a longitudinal projecting surface therebelow, a bank of drop wires, each wire having a slot the top of which is normally spaced from the upper surface and each drop wire having a projection extending into the slot below the top of the latter, the projecting surface being roughened, the projection of a fallen drop wire engaging the projecting surface to cause the top of the slot to move into engagement with the upper bar surface when the fallen wire is inclined toward the bar, the roughened surface resisting movement of the drop wire along the bar when the wire is inclined and in engagement with both surfaces.

6. In a warp stop motion, a bar extending transversely of the warp threads, a bank of drop wires each having a slot therein through which the bar extends, a rib extending along the bar below the upper surface of the latter, and a projection on the drop wire extending into the slot and adapted for engagement with the rib when the drop wire is fallen, the rib and projection of a fallen drop wire becoming the pivot around which the upper part of the drop wire swings when deflected laterally to cause the upper surface of the bar and resist further movement along the bar, the rib having a roughened surface to assist in resisting movement of the fallen drop wire along the bar.

7. In a warp stop motion, a bar extending

transversely of the warp threads, a bank of drop wires each having a slot therein through which the bar extends, a rib extending along the bar below the upper surface of the latter, and a projection on the drop wire extending into the slot and adapted for engagement with the rib when the drop wire is fallen, the rib and projection of a fallen drop wire becoming the pivot around which the upper part of the drop wire swings when deflected laterally to cause the upper part of the slot in the fallen drop wire to engage the upper surface of the bar and resist further movement along the bar, the upper surface of the bar being roughened to resist movement of the drop wire along the bar.

8. In a warp stop motion, a bar extending transversely of the warp threads, a bank of drop wires each having a slot therein through which the bar extends, a rib extending along the bar below the upper surface of the latter, and a projection on the drop wire extending into the slot and adapted for engagement with the rib when the drop wire is fallen, the rib and projection of a fallen drop wire becoming the pivot around which the upper part of the drop wire swings when deflected laterally to cause the upper part of the slot in the fallen drop wire to engage the upper surface of the bar and resist further movement along the bar, the bar having a roughened surface to engage a deflected fallen drop wire.

9. In a warp stop motion, a bar extending transversely of the warp threads, a bank of drop wires each having a slot therein through which the bar extends, a rib extending along the bar below the upper surface of the latter, and a projection on the drop wire extending into the slot and adapted for engagement with the rib when the drop wire is fallen, the rib and projection of a fallen drop wire becoming the pivot around which the upper part of the drop wire swings when deflected laterally to cause the upper part of the slot in the fallen drop wire to engage the upper surface of the bar and resist further movement along the bar, the bar having a roughened surface to engage a deflected fallen drop wire, the roughened portion of the bar including transverse grooves.

10. In a warp stop motion, a bar extending transversely of the warp threads, a bank of drop wires each having a slot therein through which the bar extends, a rib extending along the bar below the upper surface of the latter, and a projection on the drop wire extending into the slot and adapted for engagement with the rib when the drop wire is fallen, the drop wires corresponding to the unbroken threads turning about the warp threads as a center when the tops of all the drop wires are deflected in a direction along the length of the bar, and the upper part of the fallen drop wire turning around the rib as a pivot as said fallen drop wire is acted upon to move along the bar, the upper portion of the slot of the fallen drop wire thereby being brought into contact with the bar sooner than the corresponding portion of the slots of the drop wires on the unbroken threads.

11. A contact bar for a warp stop motion, said bar having an upwardly inclined cam surface at one side positioned to engage and deflect a fallen drop wire, having a slot and a side lug projecting into said slot and spaced from the upper end thereof, said surface being roughened to resist movement of the fallen wire along the bar.

12. A contact bar for a warp stop motion, said bar having an upwardly inclined cam surface at one side positioned to engage and deflect a fallen drop wire, having a slot and a side lug projecting into said slot and spaced from the upper end thereof, the bar having a roughened surface to engage a fallen drop wire and resist movement thereof along the bar.

13. In a warp stop motion, a fixed bar extending transversely across the warp threads, a set of drop wires having slots through which the bar extends, and means defining a series of closely adjacent notches extending along the bar and positioned for engagement with the upper transverse end portion of the slot of a fallen drop wire to resist movement of the drop wire along the bar.

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