May 6, 1930. H. A. DAVIS 1,757,940

WARP STOP MECHANISM

Filed Aug. 2, 1928

Fig. 1

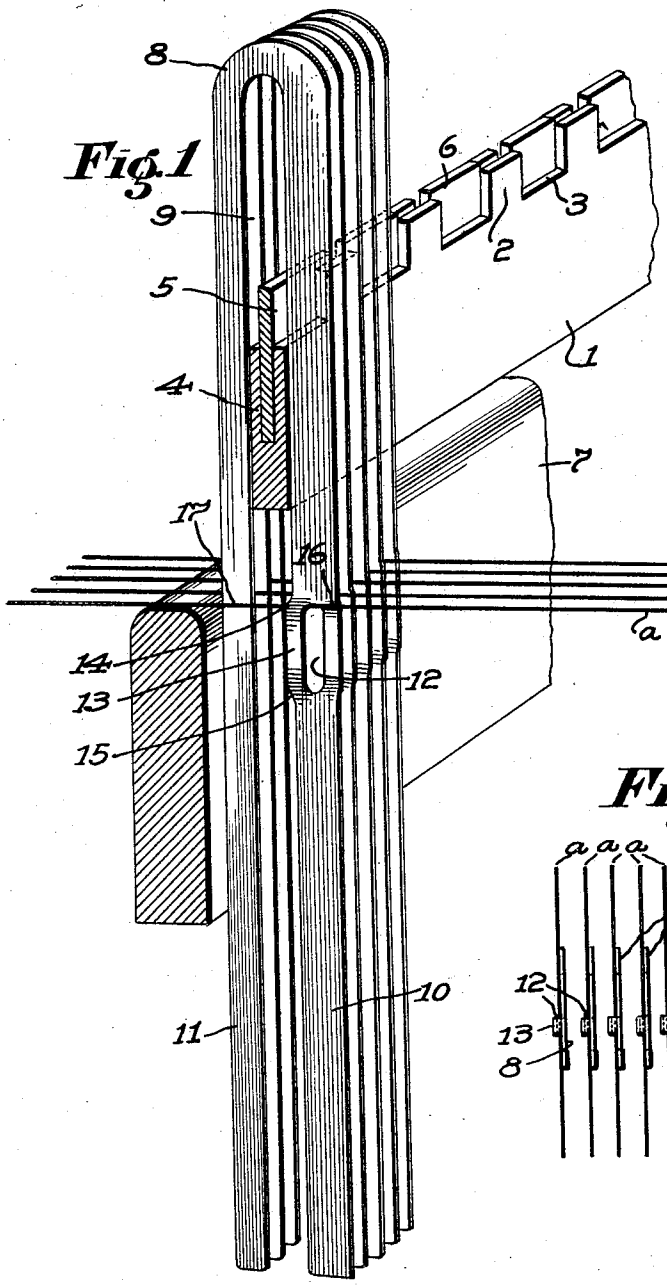


Fig. 2

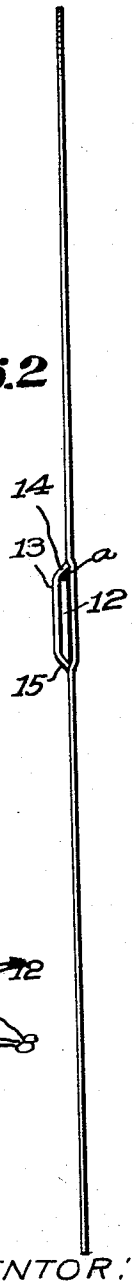


Fig. 3

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WARP STOP MECHANISM

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This invention relates to warp stop mechanisms for looms or warpers, and more particularly to the drop wires of such mechanisms which are normally supported by the warp threads and serve to effect machine stoppage on the occurrence of a warp fault.

It is now the ordinary practice to provide drop wires of warp stop motions with a passageway or hole through which a warp thread may be passed to thereby support the drop wires upon the intact warp threads and permit a drop wire to fall should the supporting warp thread break or become too slack. The drop wires are usually constructed of light metal strips, each having a passageway for a warp thread formed by an opening through the metal strip from side to side, and since the warp threads are under lengthwise tension, either in the loom or warper, the drop wires are themselves twisted or turned about their vertical longitudinal axis at an angle to the line of travel of the warp threads. This angular position of the drop wires is objectionable because they are arranged in banks or rows in close relation and the edges of the drop wires chafe against the adjacent warp threads with injurious effect and, when released on the occurrence of a warp fault, the fallen drop wire may not properly cooperate with the detector mechanism.

One of the objects of the present invention is to overcome those and other objections, and enable the drop wires to be supported upon the warp threads with the sides of the drop wires in parallel relation with the warp threads on which they are associated. In accordance with one feature of the present invention the drop wires are each provided with an opening or passageway off-set to one side of the drop wire for the passage of the associated warp thread, with the result that the warp thread does not pass from one side to the other of the drop wire but remains only on one side thereof with no tendency to twist or turn the drop wire angularly about its vertical axis, so that the sides of the drop wire remain parallel to the line of travel of the warp threads, chafing of the warp threads against the edges of adjacent drop wires is avoided, and the drop wire remains in proper relative position with the detector mechanism when released by the occurrence of a warp fault.

The drop wires in the present instance of the invention are associated with warp stop mechanism of any usual type, and each may be provided with a guide bar slot through which a guide may be passed to direct the movements of the drop wires, and, as a good practical form, the drop wires are shown as of the hair pin type having two legs, in one of which is formed the offset opening or passageway for the warp threads.

In this character of drop wire it is preferable to form one leg of the drop wire wider than the other to accommodate the off-set opening or passageway for the warp threads while the narrower leg may be positioned between adjacent warp threads and assist in maintaining the drop wires in parallel relation with the line of travel of the warp.

The invention will best be made clear from the following description and the accompanying drawings of one good practical form thereof.

In the drawings:

Fig. 1 is a perspective view of parts of a warp stop mechanism and drop wires containing the present invention, some of the parts being shown in section;

Fig. 2 is an edge view of one of the drop wires;

Fig. 3 is a diagrammatic view in plan showing the drop wires and warp threads on an enlarged scale in their associated relation.

Warp stop mechanisms may be generally classified as of two types, one in which a detector has an oscillating movement in the direction of the line of travel of the warp threads, and the other in which the detector is given a reciprocating movement in a direction transversely of the loom.

In the illustrated form of the invention as shown by the drawings herewith, the warp stop mechanism is illustrated as of the second type and only such parts thereof are indicated as appear necessary for a proper understanding of the present invention, which relates

more particularly to the drop wires used in such mechanisms.

As shown by Fig. 1, the guide bar 1 is mounted on the loom frame, as usual, and extends transversely thereof, such guide bar in the present instance of the invention being provided with a series of teeth 2 and depressions 3 between the teeth. The guide bar 1 is likewise provided, as shown, with a longitudinal groove or recess 4 in which is mounted the movable detector bar 5 which also extends transversely of the machine and is provided with a series of teeth 6, the construction being such that should a drop wire be released by its supporting warp thread it will drop and engage between the teeth of the bars and arrest movement of the movable bar to thereby effect machine stoppage, and such parts may all be of usual construction.

It is usual in warp stop mechanisms to provide a warp rest on which the warp threads may be supported as they travel through the openings in the drop wires, and one of such warp rests 7 is herein indicated, it being understood that any suitable number may be employed.

The drop wire 8 of the present invention is illustrated as of the hair pin type which lends itself advantageously for employment in a warp stop mechanism of the general character described. The drop wire 8 is provided with a guide opening 9 which may extend the full length of the drop wire or be otherwise formed, its purpose being to provide an opening through which the guide bar 1 extends for the purpose of guiding the drop wires in their movements.

At each side of the opening 9 of the drop wire is a leg portion, one of which, as 10, is preferably somewhat wider than the other leg portion 11. The leg portion 10 is provided with an opening or passageway 12 through which a warp thread *a* may be passed and by which the drop wire itself may be supported on the warp thread. The opening 12 in the drop wire is off-set to one side thereof, as shown, the result being that when a warp thread *a* is passed through the opening or passageway thus off-set to one side of the drop wire, the warp thread itself does not pass from one side to the opposite side of the drop wire but remains on one side thereof, as indicated in Figs. 2 and 3, and consequently exerts no twisting tendency to deflect the drop wire about its longitudinal axis into an angular relation with the path of travel of the warp threads.

The off-set opening or passageway 12 may be variously formed, and in the present instance of the invention it is provided by punching or removing a portion of the drop wire and bending one of the walls at the front or back of the opening laterally of the side of the drop wire, as indicated at 13, Fig. 2. Under the conditions stated, the deflected portion 13 of the drop wire affords a supporting seat 14 for the warp thread *a* when it has passed through the opening at one side of the drop wire, and the opening 12 thus formed is closed at its lower portion, as indicated at 15, thereby insuring that during the weaving operation any jumping action imparted to the drop wire by the warp threads in forming the shed will not disengage the drop wire from its supporting warp thread.

Where the drop wire is of the hair pin type, as shown, the narrow leg 11 of the drop wire takes position between the adjacent warp threads, as indicated in Fig. 1, but with no tendency to chafe the warp threads between which it extends, by reason of the fact that the drop wire itself has its side faces parallel to the line of travel of the warp threads, and this disposition of the narrow leg of the drop wire further insures the continuing parallelism of the drop wire with the line of travel of the warp threads, so that in conjunction with the off-set opening or passageway 12 the drop wire is maintained in proper relation to cooperate with the warp stop detector mechanism.

During the weaving operation the warp threads are under longitudinal tension and bear on only one side of the drop wires, as indicated at 16, where the warp thread passes through the off-set opening 12, and also on the same side of the leg portion 11, as indicated at 17, with the result that the tension of the warp thread has no tendency to deflect or turn the drop wire into an angular relation with the path of travel of the warp threads, but, on the contrary, the warp threads *a* and the drop wires 8 as a whole assume the parallel relation as indicated in Fig. 3 and avoid chafing of the warp threads against the edges of the drop wire, while the drop wire itself is maintained in proper relation with the detector mechanism to cooperate therewith when a drop wire is released by its supporting warp thread.

While the invention has been described more particularly with respect to a hair pin type of drop wire, it is to be understood, of course, that it may be advantageously employed in other types of drop wires, the essential in this respect being that the opening or passageway for the warp thread shall be off-set to one side of the drop wire to permit the warp thread to pass through the opening and maintain position at only one side of the drop wire.

The invention has been herein shown and described in connection with a warp stop mechanism for looms, but is not limited to such use, as it may be advantageously employed in other machines, such, for instance, as the warper, wherein a series of warp threads are taken from a source of supply and wound in parallel relation on a warp beam, so that the term "warp stop motions"

as employed in the specification and claims is to be construed as the warp stop motion of the loom, warper, or any other machine wherein warp threads are arranged in parallel relation and wound upon a receiver.

What is claimed is:

1. A drop wire for warp stop motions having a wide and a narrow leg portion arranged in parallel relation in the same vertical plane, and a warp opening formed in the wide leg portion and having a laterally offset wall at one side of the vertical plane passed through both leg portions that a warp thread passed through said opening shall bear upon the same side face of each leg portion while said offset wall engages the opposite side of the thread.

2. A drop wire for warp stop motions having a wide leg portion and a separated narrower leg portion, the side faces of which are in the same vertical plane, and a warp opening formed in the wide leg portion and having a laterally offset wall at one side of the vertical plane passed through the corresponding side faces of the two leg portions that both leg portions shall rest upon the same side of a warp thread passed through said opening while said offset wall engages the opposite side of the thread.

3. A drop wire for warp stop motions having two separated leg portions the side faces of which are in the same vertical plane, and one of said leg portions being provided with a warp opening having an offset wall at one side of the vertical plane passing through the corresponding side faces of the two leg portions that both leg portions shall bear upon the same side of a warp thread passed through said opening while the offset wall engages the opposite side of the thread.

4. In a warp stop motion, the combination of a transversely movable toothed detector bar, a drop wire having two separated leg portions forming a detector bar receiving slot, one of said leg portions having a warp opening provided with an offset wall adjacent said slot and disposed at one side of a vertical plane passed through the corresponding side faces of the leg portions that the leg portions at each side of the toothed detector bar shall bear upon the same side of a warp thread passed through said opening while the offset wall engages the opposite side of the thread.

In testimony whereof, I have signed my name to this specification.

HARRY A. DAVIS.