March 4, 1941. W. F. PENLAND 2,233,552

WARP STOP MOTION

Filed May 10, 1940 2 Sheets-Sheet 1

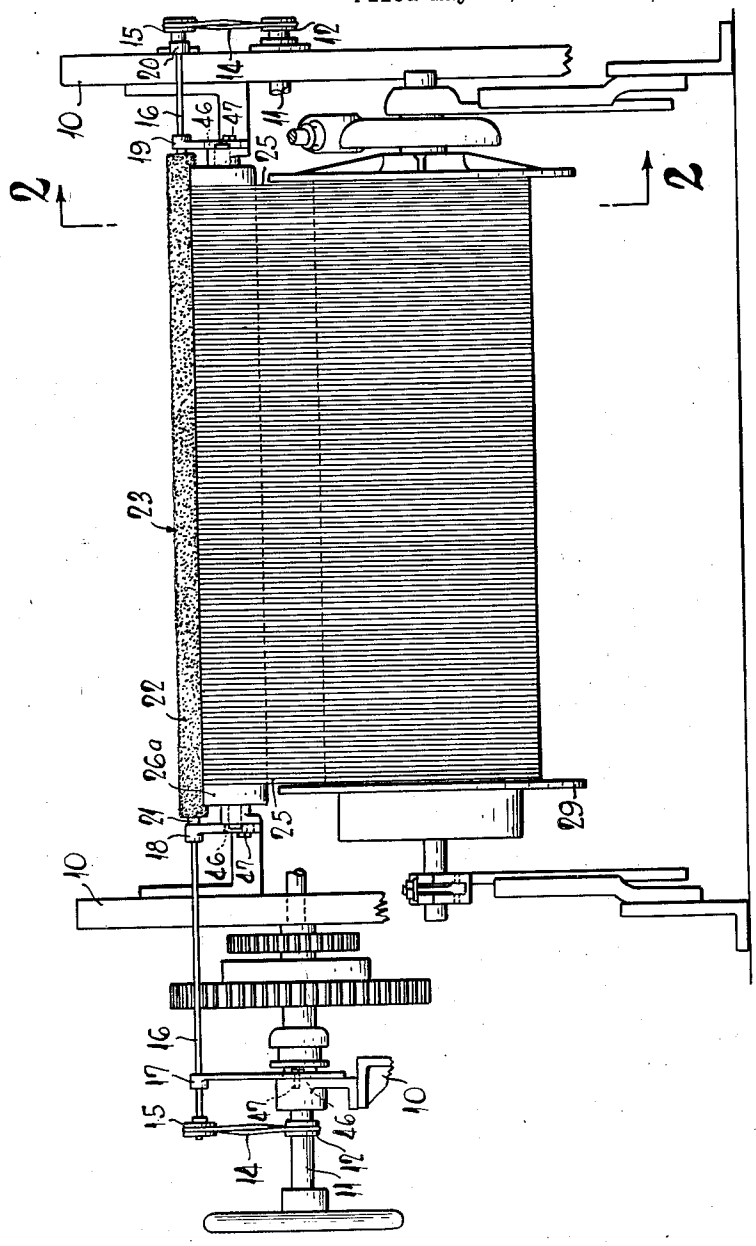

Fig. 1

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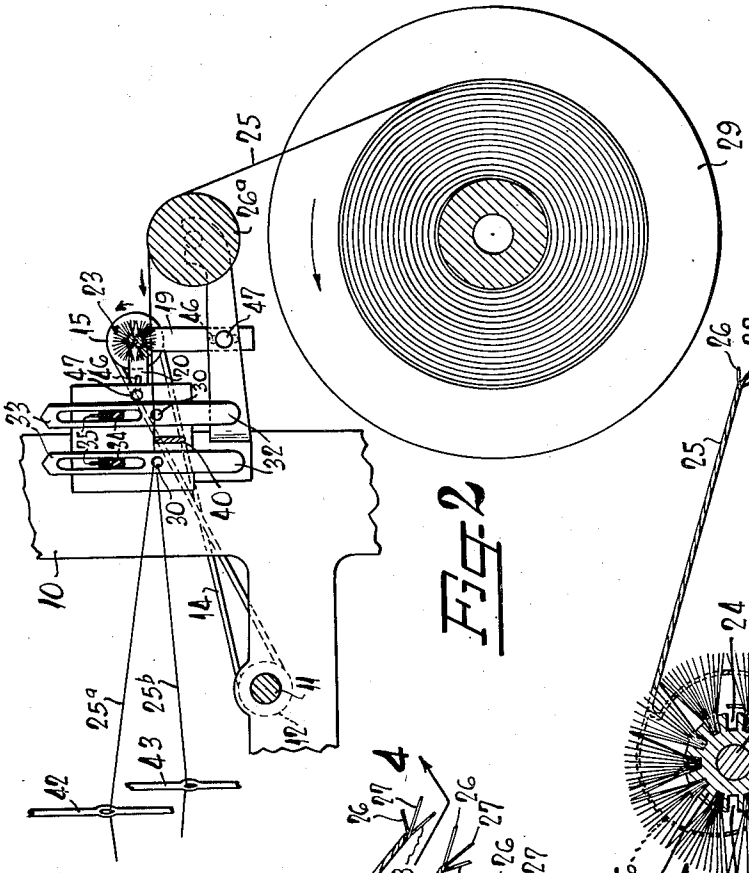

Fig. 2

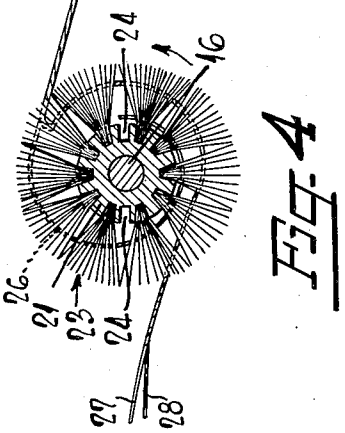

Fig. 4

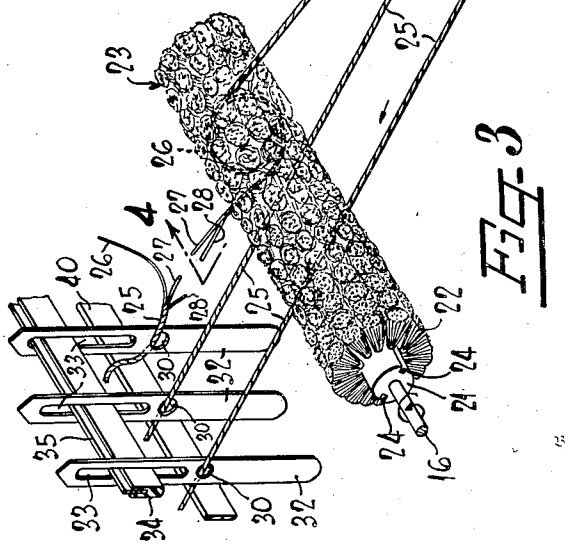

Fig. 3

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UNITED STATES PATENT OFFICE

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WARP STOP MOTION

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Application May 10, 1940, Serial No. 334,376

3 Claims. (Cl. 139—349)

This invention relates to a warp stop motion for looms and more especially to a stop motion which is adapted to operate upon the warp when weaving clothing having plied yarn warp threads.

Where a warp of plied yarn ends is used for weaving purposes, much difficulty is encountered when only one of the plies of an end becomes broken, leaving the unbroken ply or plies for supporting its associated drop wire. Since all the plies of an end must be broken before the drop wire will fall to stop the loom, much inferior cloth has been produced as a result of these partially broken plied ends being woven into the cloth.

It is therefore an object of this invention to provide a simple and efficient stop motion which is adapted to contact the warp ends and completely break any partially broken strands so that the corresponding drop wire can fall to stop the loom.

Specifically the invention comprises a rotary brush passing through the warp ends in a direction opposite to the direction of travel of the warp. This brush will become entangled with any broken plies of a strand or end and cause the same to be wrapped therearound as it rotates. The rotation of the brush will produce an excess strain in the unbroken ply or plies, resulting in all of the plies becoming broken to allow the associated drop wire to fall and stop the loom.

Some of the objects of the invention having been stated, other objects will appear as the description proceeds, when taken in connection with the accompanying drawings, in which—

Figure 1 is an end elevation of a loom showing my improved stop motion associated therewith;

Figure 2 is a vertical, longitudinal sectional view taken along the line 2—2 in Figure 1;

Figure 3 is an isometric view showing the manner in which the brush engages the warp ends and entangles the broken ply or plies of an end to completely break the same;

Figure 4 is a sectional view taken along the line 4—4 in Figure 3, showing a broken ply of a strand entangled in the brush as it is rotated.

Referring more specifically to the drawings, the numeral 10 designates a loom frame having conventional crank shaft 11, upon which pulleys 12 are secured, said pulleys having belts 14 thereon which belts are also mounted upon a second set of pulleys 15 on a brush shaft 16. The brush shaft 16 is rotatably mounted in bearings 17, 18, 19 and 20, which, in turn, are supported by the loom frame 10.

Between the bearings 18 and 19, a cylindrical member 21 is fixedly mounted on the shaft 16, said member 21 being adapted to have radially disposed bristles 22 extending from its periphery to form a suitable brush. The members 21 and 22 are broadly designated by the reference character 23. The cylindrical member 21 has suitable longitudinally disposed grooves 24 in its periphery which may be used to guide the point of a knife when it is desired to sever and remove any plies or strands of yarn which have been wrapped around the brush.

The lower portion of the brush is adapted to rotate through a plurality of warp ends 25, each warp end being of plied yarn and comprising two or more plies such as 26, 27 and 28. The warp ends 25 are adapted to pass from a suitable roller 26a as it approaches the brush 23. Warp beam 29 is adapted to have the warp ends 25 wrapped therearound, from whence the warp ends pass upwardly over roller 26a and then through the lower portion of the rotating brush 23. After passing through the brush 23 the warp ends 25 pass through holes 30 in a conventional drop wire 32, said drop wires also having slots 33 in the upper portions thereof which encircle an insulation bar 34. Disposed in the upper portion of the insulation bar 34 is a conductor bar 35, which, when contacted by a drop wire 32 will operate a circuit to stop the loom in a well known manner, since the lower ends of the drop wires will contact another metallic member (not shown) to close the stop motion circuit.

In Figure 3 it is seen that the two drop wires nearest the observer are in raised position by unbroken strands 25, so that the upper ends of slots 33 in drop wire 32 cannot contact the conductor bar 32. The other strand, however, is shown broken between the brush 23 and the drop wires thereby allowing its associated drop wire to fall and cause contact to be made between the upper portion of slot 33 and the contact bar 35.

A supporting bar 40 is provided between the two rows of drop wires 32 (see Figure 2) for supporting the yarn ends 25.

The direction of rotation of the brush 23 is such that when one of the plies 26 or 27 is broken and the other ply remains unbroken, that the bristles will entangle the broken end or ends and rotate the same away from the drop wires. This will create an excess tension in the unbroken strand and ultimately the unbroken ply or plies will be broken to allow its associated drop wire to fall

and to make the necessary electrical contact for stopping the loom.

After passing through the drop wires, warp ends 25 are divided into two sheds, namely 25*a* and 25*b*, the shed 25*a* being supported by one set of heddles 42 and the shed 25*b* being adapted to be supported by another set of heddles 43. These heddles are actuated in a conventional manner in order to produce the desired sheds during a weaving operation. During the weaving operation, the warp ends travel from the warp beam 29 over the roller 26*a*, through the bristles 22 through drop wires 32, heddles 42, and 43 and then to other conventional arts of the loom.

If it is desired to raise or lower the brush 23 so that the bristles will penetrate the warp a varying amount, it is only necessary to adjust brackets 17, 18, 19 and 20 vertically. These brackets are all provided with slots 46 which slots are penetrated by a securing bolt 47.

In the drawings and specification there has been set forth a preferred embodiment of the invention, and although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation, the scope of the invention being set forth in the appended claims.

I claim:

1. In a loom having a warp beam for receiving plied ends, a contact bar and drop wires, the warp ends from said beam normally holding said wires out of engagement with the bar, a rotary brush disposed above the warp ends and between the drop wires and the warp beam and passing between said warp ends and engaging said ends, and means for rotating said brush in a direction away from the drop wires whereby a broken ply will be entangled therewith to thereby cause the unbroken ply or plies of a warp end to be broken and allow the associated drop wire to fall and engage said contact bar to stop the loom.

2. In a loom structure having stop motion drop wires and a warp beam with a warp of plied yarn ends emanating therefrom, the tension in said plied yarn ends being adapted to hold the stop motion in an inoperative position, a rotary brush disposed above the yarn ends between the stop motion drop wires and the warp beam for contacting said ends, and being adapted to engage any broken ply or plies, and means for rotating said brush in a direction away from the drop wires to thereby cause the engaged ply or plies to be entangled therewith and to break the unbroken ply or plies and allow the stop motion to be actuated for stopping the loom.

3. In a loom structure having stop motion drop wires and a warp beam with a warp of plied yarns emanating therefrom, the tension in said plied yarns being adapted to hold the stop motion in an inoperative position, a horizontally disposed rotary brush disposed above the warp ends and between the stop motion drop wires and the warp beam for contacting all of said warp ends to engage any broken plies, and means for rotating said brush and the engaged broken ply away from the stop motion to thereby break the unbroken ply to relieve the tension in the strand and allow the stop motion to move to operative position.

WILLIAM F. PENLAND.