Feb. 20, 1945. J. K. DUDLEY 2,370,022

WARP REGULATOR

Filed Dec. 31, 1943

Fig. 1

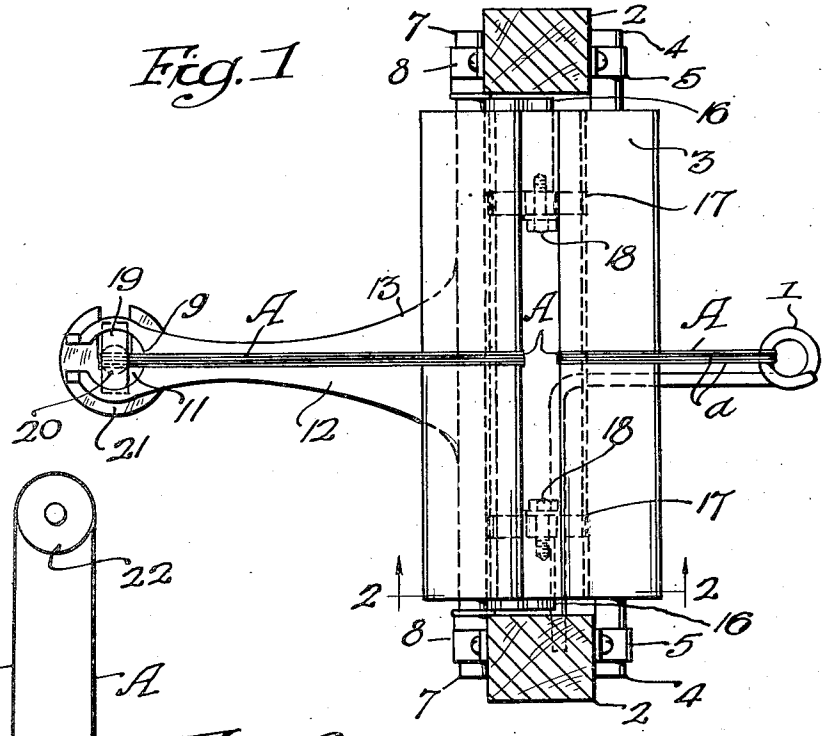
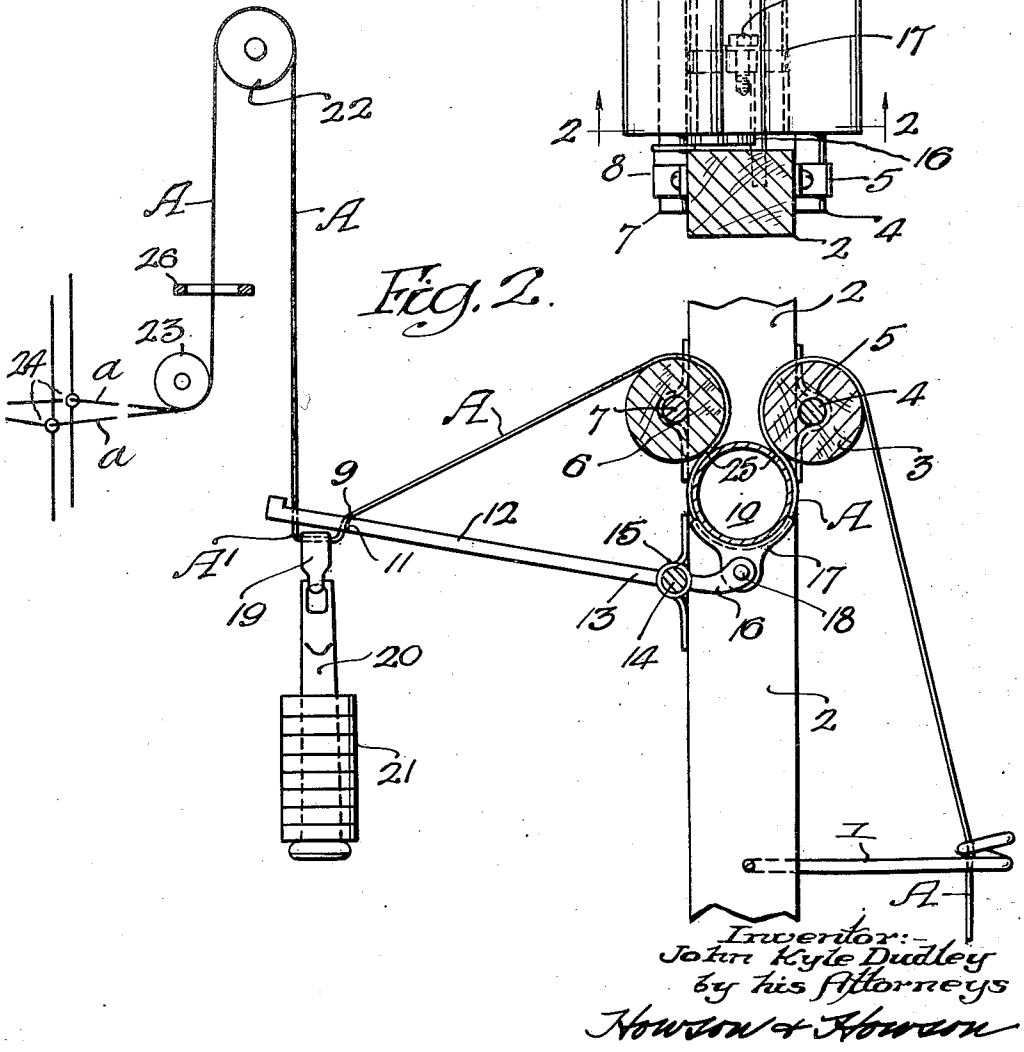


Fig. 2.



Patented Feb. 20, 1945 2,370,022

UNITED STATES PATENT OFFICE

2,370,022

WARP REGULATOR

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Application December 31, 1943, Serial No. 516,560

4 Claims. (Cl. 139—104)

This invention relates to warp regulating mechanisms, and particularly to an improved form for use in looms adapted to weave a plurality of strips of narrow fabric, such as tape, ribbon, webbing, etc., simultaneously. The present invention is also applicable to looms adapted for weaving single wide strips of fabric.

Prior to the present invention the warp threads for each individual strip in a multiple strip weaving loom have been wound on a separate spool and each time it became necessary to replenish the warp supply for any one strip it has been necessary to discontinue the weaving of the entire series while the operator tied the ends of the warp threads of a new spool onto the retiring ends of the warp threads from the depleted spool.

The warp threads are frequently delivered to the weaving establishment from the spinning mill in rope form, with the ropes baled or wound in balls, with or without wooden cores, or on cones, tubes, etc., and heretofore it has been necessary to backwind the threads onto the conventional warp spools for use in the loom.

One of the objects of the present invention is to provide a warp regulating mechanism which will make it possible to utilize the warp threads in the loom while the warp is still in the rope form, as received from the spinners, thus eliminating the expense involved in the back winding operation.

Another object of the invention is to provide a warp regulating mechanism by which it will be possible to use the warp rope direct from the original packages or from suitable receptacles at the back of the loom in which the ropes may be placed, whereby, while the loom is running and before a warp supply becomes completely exhausted, the operator may tie the ends of the warp threads of a substantially depleted supply to the ends of the warp threads of a fresh supply, thereby avoiding the necessity for shutting down the loom each time any one warp supply being used in the loom becomes practically used up.

In the accompanying drawing:

Fig. 1 is a sectional plan view of sufficient of a narrow fabrics loom to illustrate the principles of the present invention as applied thereto; and

Fig. 2 is a sectional elevational taken on the line 2—2, Fig. 1.

In the drawing, the warp for a single strip of fabric is shown at A, in rope form, as it comes from the spinners.

The warp rope A, as is well known in the industry, consists of a plurality of individual warp threads *a*, *a*, which are grouped together with no twist. The individual threads merely cling together and can be readily separated when desired.

For the purpose of the present invention the rope A is drawn from a supply located at the back of the loom, and is led therefrom vertically through a pig tail guide 1 secured to a rigid portion 2 of the frame of the loom.

From the eye of the pig tail guide 1, the rope A is led up and over a suitable traction roll 3 which is provided with a shaft or with trunnions 4,4 rotatably mounted in bearings 5,5 carried by the uprights 2,2 of the loom frame.

From the traction roll 3, the warp rope A is led down and under a floating roll 10, then up and over a second traction roll 6 having trunnions 7,7 rotatably mounted in bearings 8,8 secured to the uprights 2,2, with the axes of the trunnions 4,4 of the roll 3 and the trunnions 7,7, of the roll 6 in substantially the same horizontal plane, and with the peripheral faces of the rolls 3 and 6 in laterally spaced relation to each other and affording a rolling contact for the floating roll 10.

From the second traction roll 6, the warp rope A is led through an eye or recess 11 formed in the outer forked and of a long arm 12 of a brake lever 13. The brake lever 13 is provided with trunnions 14 pivotally mounted in bearings 15 secured to the uprights 2,2.

The brake lever 13 is provided with a pair of laterally spaced short arms 16, 16, to the outer end of each of which is pivotally attached a brake shoe 17, at 18. The brake shoes 17, 17 bear against the under side of the floating roll 10, at opposite sides respectively of the warp rope A, as clearly shown in Fig. 1.

The warp rope A passes downwardly through the eye or recess 11 in the outer end of the long arm 12 of the brake lever 13 to and through a ring or eye 19 formed on or connected to the upper end of a weight stem 20, on which is mounted a plurality of removable and replaceable weights 21,21.

The rope A is formed in a loop A1 depending from and passing through the recess or eye 11 formed in the outer forked end of the lever arm 12 of the brake lever 13, and, after passing through the weight hanger eye 19, is led upwardly and over the top side of the upper castle roll 22 of the loom.

After passing around the castle roll 22 the individual warp threads *a*,*a* are separated and

fanned out into side by side relation to each other by passing through dents or slots in a fixed back reed 26.

The laterally separated warp threads 2,2 then pass downwardly and around the under side of a lower whip or other roll 23 from which these individual threads pass to and through the heddle eyes 24,24 of the loom harness, and thence to the fell of the fabric and the usual take up rolls of the loom (not shown).

Normally, during the weaving operation, back tension is applied to the warp threads *a*, *a*, by the rope A being snubbed around the floating roll 10 and gripped between the outer surface of this snubbing roll and the two traction rolls 6 and 3, which latter are adapted to rotate by and under the weaving or take up pull of the rope A, which is in frictional engagement with the rolls 3, 10 and 6.

Rotation of the snubbing or floating roll 10 is retarded or actually prevented by the brake shoes 17, 17, under pressure applied by the weights 21 and hanger 20—19, through the loop *Al* of the rope A and the leverage of the long arm 12 of the brake lever 13 to the brake shoes 17, 17 bearing against the roll 10.

As the warp threads *a*, *a* are used up in the weaving operation and are drawn off by the fabric take up mechanism of the loom, the loop *Al* is shortened until the end 19 of the weight hanger 20 engages the underside of the outer forked end of the long arm 12 of the brake lever 13, whereupon, the brake lever 13 is rocked on its pivot 14 and causes the braking action of the brake shoes 17, 17 to be relieved from the snubbing roll 10.

The weights 21, 21 tend to draw out the loop *Al* thereby effecting rotation of the traction rolls 6 and 3 and the interposed floating roll 10 and effecting a paying out of the warp rope A until the loop *Al* becomes elongated to a predetermined extent, whereupon, the friction of the rope A running downwardly over the inner edge 9 of the recess 11 in the outer forked end of the lever arm 12, plus the difference in the lengths of the two lever arms 12 and 16, causes the brake shoes 17, 17 to be effectively applied to the floating roll 10 which causes a snubbing action of the roll 10 on the warp rope A, pinching said rope at the points 25, 25, between the peripheral faces of the roll 10 and rolls 3 and 6.

By the foregoing construction and mode of operation an even uniform tension is applied to the rope A at all times, thus producing a uniform texture in the fabric into which the individual warp threads *a*, *a* are woven.

By providing the floating roll 10, for pinching the warp rope A against the spaced traction rolls 3 and 6, and by pivotally mounting the brake shoes 17, 17 on the ends of the lever arms 16, 16, the whole of the regulating mechanism is free to find its own operating position without binding of any parts thereof which may tend to disturb the equal uniform paying out of the warp threads *a*, *a* as required.

A number of ropes A may be used to form the warp of a wide strip of fabric, in which case each rope would be under separate control of a warp regulating mechanism such as previously described herein. The threads making up the various ropes can be used in the warp of a wide fabric in any way desired, such as one rope for each of a number of sections of the fabric or the threads of the series of ropes may pass through successive dents respectively in a back reed similar to the reed 26, whereby the fabric would be made up of one thread from each rope in succession across the width of the fabric, without departing from the spirit of the present invention.

I claim:

1. A warp regulator comprising a pair of laterally spaced rolls freely rotatable about laterally spaced fixed axes and an interposed floating roll below said pair of rolls and engageable peripherally therewith and around and between which a warp is adapted to pass, means for bodily moving said interposed floating roll upwardly into the space between said pair of rolls to pinch said warp therebetween, and means for retarding rotation of one of said rolls.

2. A warp regulator comprising a pair of laterally spaced rolls freely rotatable about laterally spaced fixed axes and an interposed floating roll below said pair of rolls and engageable peripherally therewith and around and between which a warp is adapted to pass, means for bodily moving said interposed floating roll upwardly into the space between said pair of rolls to pinch said warp therebetween, and means for retarding rotation of said floating roll.

3. A warp regulator comprising a pair of laterally spaced rolls freely rotatable about laterally spaced fixed axes and an interposed floating roll below said pair of rolls and engageable peripherally therewith and around and between which a warp is adapted to pass, and means for bodily moving said interposed roll upwardly into the space between said pair of rolls to pinch said warp therebetween and for retarding rotation of said floating roll comprising a pivoted lever, a pair of brake shoes pivotally mounted on said lever and engageable with said floating roll at opposite sides respectively of said warp, and means for rocking said lever to effect engagement of said shoes with said floating roll and the pinching of said warp between said floating roll and said pair of rolls.

4. A warp regulator comprising a pair of laterally spaced freely rotatable rolls and an interposed floating roll around and between which a warp is adapted to pass, and means for retarding rotation of said floating roll comprising a pair of brake shoes engageable with said floating roll at opposite sides respectively of said warp, a brake lever to which said shoes are pivotally connected and through an opening in the outer end of which said warp passes in the form of a loop, and weight means for drawing said warp into said loop through said lever and for rocking said lever to apply said shoes to said floating roll.

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