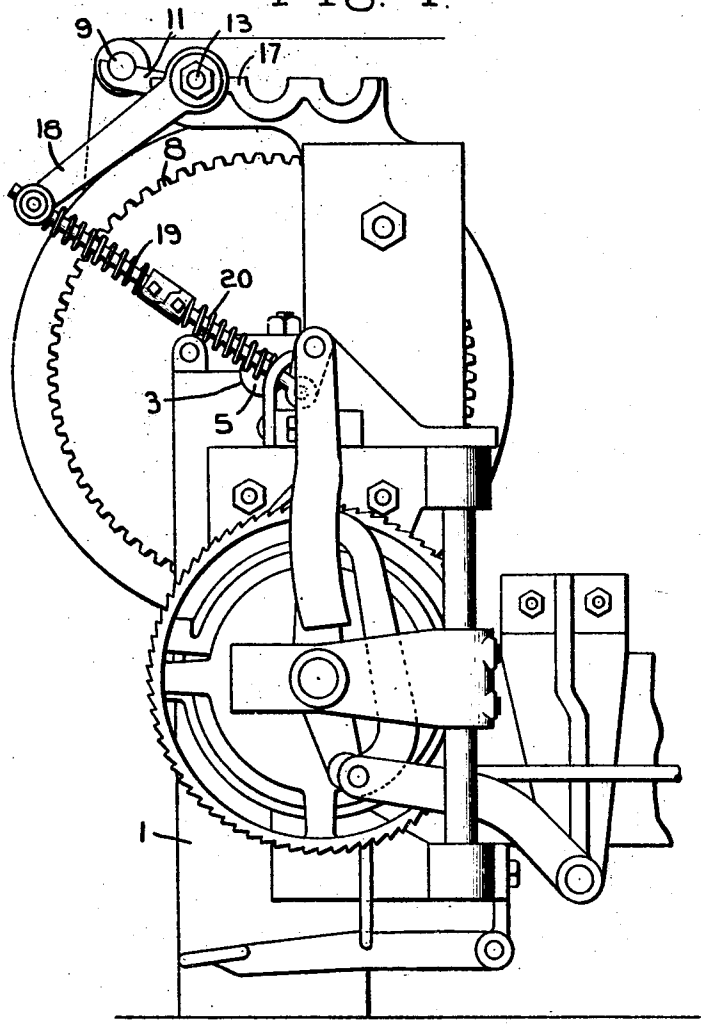
Jan. 27, 1931. H. A. DAVIS 1,790,201

WHIP ROLL CONSTRUCTION FOR LOOMS

Filed Sept. 13, 1928 2 Sheets-Sheet 1

Fig. 1.



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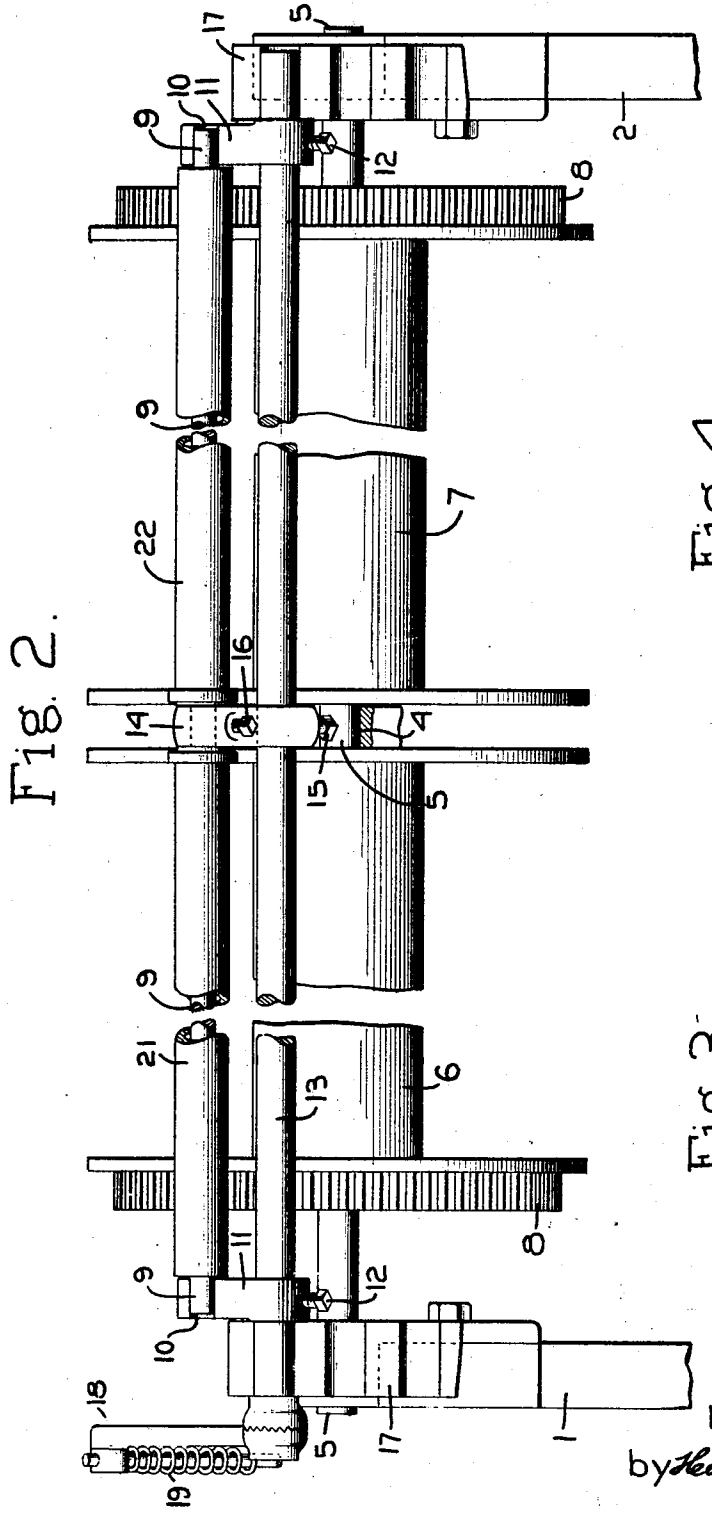


Fig. 2.

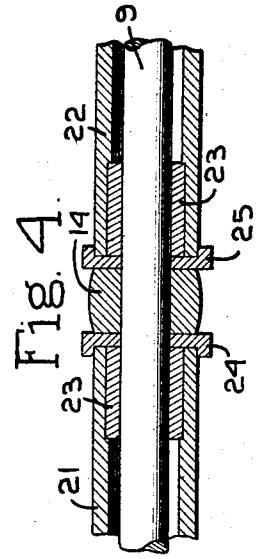


Fig. 4.

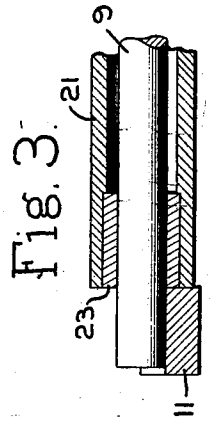


Fig. 3.

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UNITED STATES PATENT OFFICE

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WHIP-ROLL CONSTRUCTION FOR LOOMS

Application filed September 13, 1928. Serial No. 305,768.

This invention relates to a whip roll construction for a loom of that type in which the warp beam is in two or more sections. In such a type of loom, it is necessary to equalize the tension on the warps extending from the different sections of the warp beams and various means have been provided for that purpose. Such looms, in common with other types of looms, are usually provided with a whip roll over which the warps pass from the various beam sections and this whip roll is usually bodily movable by and against the entire warp sheet to control the tension and effect the required let-off. But it is found in practice that the whip roll acts unequally upon and produces an unequal drag upon the warps extending from the different beam sections.

It is the object of the present invention to provide a whip roll for cooperating with a sectional warp beam and in which the sections of the whip roll cooperating with the warp beam sections shall act independently.

It is a further object of the invention to provide a whip roll having a plurality of warp-engaging sleeves independently rotatable and corresponding to the warp beam sections.

It is a further object of the invention to provide a whip roll having a plurality of independently rotatable warp-engaging sleeves, together with means for preventing the warps running over the sleeves from sliding over the ends thereof.

These and other objects and features of the invention will appear more fully from the accompanying description and drawings and will be particularly pointed out in the claims.

The drawings illustrate only so much of an ordinary type of loom embodying a sectional warp beam as is necessary to a disclosure of a preferred form of the present invention.

In the drawings:

Fig. 1 is a side elevation of a portion of the loom.

Fig. 2 is a top plan view partially broken away of the construction shown in Fig. 1.

Fig. 3 is a detail in longitudinal cross section of one end of the whip roll.

Fig. 4 is a detail in longitudinal cross section of the central portion of the whip roll.

The side frames 1 and 2 of the loom are provided in their rear portions with suitable bearings 3 in which, together with an intermediate bearing 4, are supported the gudgeons 5 of two axially aligned warp beam sections 6 and 7. These warp beam sections are shown as of a usual construction provided at their ends with gears 8 rigidly secured thereto and by means of which the rotation of the beam sections is controlled to secure the required tension on the warps and the desired let-off. A suitable means for thus controlling the warp beam sections through the gears 8 is illustrated and described in my application, Serial No. 178,528, filed March 26, 1927, and the mechanism there illustrated serves to equalize the tension on the warps extending from the beam sections.

The tension on the warps and the let-off is, as shown in said application and as usual, controlled by a whip roll and it is with this feature of the loom that the present invention is concerned. In the preferred construction illustrated, the whip roll comprises a shaft 9 mounted for bodily movement normal to its longitudinal axis and toward and from the warp beam and with its longitudinal axis at all times parallel to that of the warp beam. This result is secured in the construction illustrated by mounting the ends of the shaft 9 in open bearings 10 in the ends of arms 11 extending radially from and rigidly secured as by means of the set screws 12 to a rock shaft 13. The shaft 9 is further mounted in an arm 14 extending radially from and secured to the shaft 13 as by the set screw 15 between adjacent ends of the warp beam sections. Preferably the whip roll shaft 9 is locked against rotation and endwise movement by a set screw 16 in an intermediate radial arm 14. The bodily movement of the whip roll shaft normal to its longitudinal axis and toward and from the warp beam and parallel with the warp beam is thus secured by the rocking movement of the rock shaft 13 which is mounted in bearing arms or

brackets 17 secured to the loom side frames. An arm 18 secured to the rock shaft 13 extends radially rearward and downward and is shown as forming a part of a familiar type of let-off mechanism such as shown in the Draper and Roper Patent, No. 647,815, granted April 17, 1900, the tension of the warps acting to swing the whip roll shaft downward and the springs 19 and 20 acting to swing the whip roll shaft upward. But as this let-off mechanism and the mechanism for equalizing the tension on the warps running from the warp beam sections form no part of the present invention and are fully disclosed in the Draper and Roper patent and in my aforesaid application, no further description thereof is here necessary.

In the present invention, the whip roll, in addition to the whip roll shaft 9, comprises, in the preferred form illustrated, a plurality of warp engaging sleeves 21 and 22, one corresponding to each warp beam section and each independently rotatable on the whip roll shaft. Consequently if there is any variation in the movement of the warps let off from one warp beam section as compared with those let off from another warp beam section, these whip roll sections rotate independently and thus prevent any drag on the warps or any tendency to prevent absolute equalization of warp tension.

The warp engaging sleeves 21 and 22 are suitably journalled on the whip roll shaft preferably by means of bearing collars 23 mounted between the ends of the sleeves and the whip roll shaft and preferably constructed of oil-impregnated wood. These collars are shown as set in shouldered recesses formed in the sleeve ends. Such a construction permits perfect freedom of rotation of the sleeves on the whip roll shaft and secures the desired lubrication.

Since the warp sheet is continuous throughout the width of the loom where it passes through the loom harnesses and reed, but since the sheet is separated into sections by the warp beam sections, it follows that the warps leading from the warp beam sections converge toward the front of the loom and therefore the warps would tend to run off adjacent ends of the whip roll sections. In order to prevent this, the invention further comprises, in the preferred form illustrated, cupped end thrust washers fitted over those ends of the sleeves which are subject to end thrust, these cupped washers acting to prevent the warps from sliding off these ends of the sleeves. Such washers are shown in Figs. 2 and 4 at 24 and 25, the cupped washer 24 fitting over the inner end of the sleeve 21 and the cupped washer 25 fitting over the inner end of the adjacent sleeve 22. It will be noted that, for the reasons stated, the whip roll sections 21 and 22 tend to have end thrust against the radial arm 14 so that these washers 24 and 25 act both to take up end thrust and also to prevent the warps from working off the ends of the sleeves. These washers are preferably made of fibre or similar material of an anti-frictional nature.

There is thus presented a simple and efficient construction of whip roll in which the whip roll presents a plurality of independently rotatable sections corresponding to the warp beam sections, thus insuring that the whip roll shall act equally upon the entire warp sheet and that there shall be no unequal drag upon the sections of warps extending from the different warp beam sections.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is:

1. In a loom operating with a sectional warp beam, a sectional whip roll mounted to move bodily toward and from the warp beam with its longitudinal axis at all times parallel to that of the warp beam, and with the sections of the whip roll independently rotatable.

2. A loom comprising a whip roll composed of independently rotatable sections, and means for moving the entire whip roll bodily in a direction normal to its longitudinal axis.

3. In a loom, a whip roll comprising a shaft mounted for bodily movement normal to its longitudinal axis, and a plurality of warp-engaging sleeves independently rotatable on said shaft.

4. In a loom, a whip roll comprising a shaft mounted for bodily movement normal to its longitudinal axis, a plurality of warp-engaging sleeves independently rotatable on said shaft, and cupped end thrust washers fitted over those ends of the sleeves which are subject to end thrust and acting to prevent warps sliding off such sleeve ends.

5. In a loom, a whip roll comprising a shaft mounted for bodily movement normal to its longitudinal axis, a plurality of warp-engaging sleeves independently rotatable on said shaft, and bearing collars between the ends of the sleeves and the shaft.

6. In a loom, a whip roll comprising a shaft mounted for bodily movement normal to its longitudinal axis, a plurality of warp-engaging sleeves independently rotatable on said shaft, bearing collars between the ends of the sleeves and the shaft, and cupped end thrust washers fitted over those ends of the sleeves which are subject to end thrust and acting to prevent warps sliding off such sleeve ends.

7. A loom comprising a sectional warp beam, a rock shaft journalled parallel to the warp beam, radial arms rigid with the rock shaft and extending therefrom adjacent the ends of the warp beam sections, and a whip roll supported by said arms and presenting independently rotatable sections between the

arms and opposite the respective warp beam sections.

8. A loom comprising a sectional warp beam, a rock shaft journalled parallel to the warp beam, radial arms rigid with the rock shaft and extending therefrom adjacent the ends of the warp beam sections, a whip roll shaft mounted in said arms, and a plurality of warp-engaging sleeves journalled and independently rotatable on said shaft between said arms.

9. A loom comprising the construction defined in claim 8 together with cupped washers fitted over the ends of said sleeves adjacent an intermediate arm and acting to prevent warps sliding off said sleeve ends.

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

HARRY A. DAVIS.