

UNITED STATES PATENT OFFICE.

WILLIAM H. RYDER, OF PROVIDENCE, RHODE ISLAND.

MEANS FOR REGULATING THE TENSION UPON WARP-THREADS OF LOOMS.

No. 813,833.

Specification of Letters Patent.

Patented Feb. 27, 1906.

Application filed March 23, 1905. Serial No. 251,671.

To all whom it may concern:

Be it known that I, WILLIAM H. RYDER, a citizen of the United States, residing at the city of Providence, in the county of Providence and State of Rhode Island, have invented a certain new and useful Improvement in Means for Regulating the Tension Upon Warp-Threads of Looms, of which the following is a specification.

My invention relates to certain new and useful improvements in looms, of which the following is a full, clear, and exact description.

The object hereof is to provide means whereby a reduction in the tension of the warp-threads between the whip-roll and the cloth may be effected just prior to the lay striking the cloth, thus preventing the usual breakage of the yarn-threads at the said point.

Reference will be had to the accompanying drawings, wherein like characters of reference will be employed to designate corresponding parts throughout the several views, in which—

Figure 1 is a longitudinal section taken on line X X of Fig. 2, showing the positions of the parts when the tension of the warp-threads is "off" or reduced. Fig. 2 is a rear elevation showing the improved mounting for each end of the whip-rolls. Fig. 3 is a similar view to Fig. 1, showing the positions of the parts when the tension of the warp-threads is "on" or at its highest degree; and Figs. 4, 5, and 6 are detail views in elevation illustrating the time movement of parts in obtaining the desired on or off tension upon the warp-threads, Fig. 4 being a detail of position of parts in Fig. 1 and Fig. 6 a detail of position of parts in Fig. 3.

Reference-numeral 1 designates the end frame of a loom; 2, the lay thereof; 3, the whip-roll, and 4 the warp-threads between said whip-roll and lay. Extending across the loom is a crank-shaft 5, by means of which the lay is operated, and mounted on this crank-shaft at one side of the loom is an eccentric 6.

The whip-roll 3 is mounted at each end in an apertured arm 7, being secured therein in any suitable manner, as by a set-screw 8, Figs. 1 and 3. Secured in the lower end of this arm, as by a set-screw 9, is an angle-rod 18, the outer end of which forms the pivotal center of the whip-roll, said outer end being pivotally mounted in the bifurcated upper end, Fig. 6, of a bearing or support 10, having its lower end inserted and secured by a set-

screw or other suitable means 11 to the end of a bracket 12, rigidly attached to the loom-frame. One of these arms 7 is formed with an extension 14, to which is connected the arm 15 of an eccentric-strap 16, within which latter works the said eccentric 6, the strap being of greater diameter interiorly than the exterior of the eccentric to provide a clearance X therebetween. A plurality of apertures are provided in the arm 15 and a slot in the extension 14 to receive an adjusting-stud 17. The stroke of the eccentric is represented by $\langle -S- \rangle$; Fig. 4, and the bounds of the movements of the whip-roll by a , b , and c .

In operation, upon the rearward movement of the lay—*i. e.*, away from the cloth—as indicated by the arrow in Fig. 1, the tension upon the warp-threads is reduced, while in Fig. 3 upon forward movement of the lay—*i. e.*, toward the cloth—the tension is increased. Assuming the parts to be in position shown in Fig. 4, (detail Fig. 1,) wherein the tension is off the warp-threads, upon the eccentric making one-half a revolution to position shown in Fig. 5, the stroke of the eccentric, as aforementioned, being designated by $\langle -S- \rangle$, the whip-roll will be caused to move from point a to point b , placing the warp-threads under tension, owing to the rearward movement of the whip-roll. The warp-threads, however, are not under their highest tension until the parts come to position shown in Fig. 6, wherein the whip-roll has moved from point b (last assumed in Fig. 5) to point c , this latter movement being obtained by the downward tension or pull of the warp-threads and permitted by the aforementioned clearance X between the eccentric and strap. Thus it will be seen that the primary movement of the whip-roll from point a to point b is effected solely by the eccentric and the secondary or final movement is effected by the downward tension or pull of the warp-threads.

By providing the angle-rod 18 the whip-roll may be adjusted so as to swing either vertically or horizontally to throw the tension on or off of the warp-threads, and by providing the eccentric with a clearance for the movement of its strap connection takes off or reduces the sudden tension upon the warp-threads at the proper time when the weft or filling has been beaten in and prior to the lay striking the cloth. By this improved arrangement of parts more "picks" can be put in, for the reason that by taking off the tension at the proper time it allows the weft or

filling to ride one over the other. Hence whatever the counts of the yarns are in the warp or weft the tension can be adjusted to correspond in taking up what is required by the intersecting of the weave to take off or put on a proper tension, thus regulating a proper tension and reducing the breakage of threads.

I do not wish to limit myself to the exact details, as changes may be made wholly within the scope of my invention.

Having fully described my invention, what I claim as new and useful, and desire to secure by Letters Patent, is—

1. In a loom, angle-rods pivoted therein; arms secured on said angle-rods; a whip-roll secured on said arms; a crank-shaft; an eccentric actuated thereby; a strap having a connection between said eccentric and one of said arms, and said eccentric and strap having a clearance therebetween.

2. In a loom, in combination with the lay having an operating crank-shaft, of pivotal angle-rods properly supported on the loom-frame; arms secured on said angle-rods, beneath their pivot centers; a whip-roll secured in the upper part of said arms; an eccentric secured upon the crank-shaft; a strap on said eccentric having a connection with the lower part of one of said arms, arranged to partially operate the whip-roll by the crank-shaft, and said eccentric and strap having a clearance therebetween to permit the tension of the warp-threads to complete the operation, substantially as set forth.

3. In a loom, in combination with the lay having an operating crank-shaft, of fixed brackets; supports mounted in said brackets and having bifurcated upper ends; arms; a

whip-roll secured on said arms; angle-rods having one portion secured in said arms and the other portion mounted in the bifurcated ends of said supports; an eccentric secured upon the crank-shaft; a strap having a connection from said eccentric to an extension integral with one of said arms, and said strap being of greater diameter interiorly than the exterior of the eccentric to provide a clearance therebetween, substantially as set forth.

4. In a loom, a shaft, an eccentric actuated thereby, a movable whip-roll, and a connection between said whip-roll and eccentric, said connection and eccentric having a clearance therebetween.

5. In a loom, a lay, a whip-roll mounted on movable bearings, a lay-operating shaft, and connection between said whip-roll and lay-operating shaft for operating the whip-roll, comprising an eccentric and an eccentric-strap having a clearance between them.

6. In a loom, a whip-roll mounted on arms, pivotal connections between the arms and the frame of the loom, and means to operate said whip-roll comprising an eccentric and connection between the whip-roll and the eccentric having a clearance therebetween.

7. In a loom, the combination with the lay and the lay-operating means, of a swinging whip-roll, and connection between the lay-operating means and the whip-roll comprising an eccentric and an eccentric-strap having a clearance therebetween.

In testimony whereof I affix my signature in the presence of two witnesses.

WILLIAM H. RYDER.

Witnesses:

JOSEPH DERMODY,
CHARLES F. BLACK.