No. 789,522. PATENTED MAY 9, 1905.

H. B. BECKMAN.

AUTOMATIC TENSION DEVICE FOR YARN WINDING MACHINES.

APPLICATION FILED SEPT. 17, 1903.

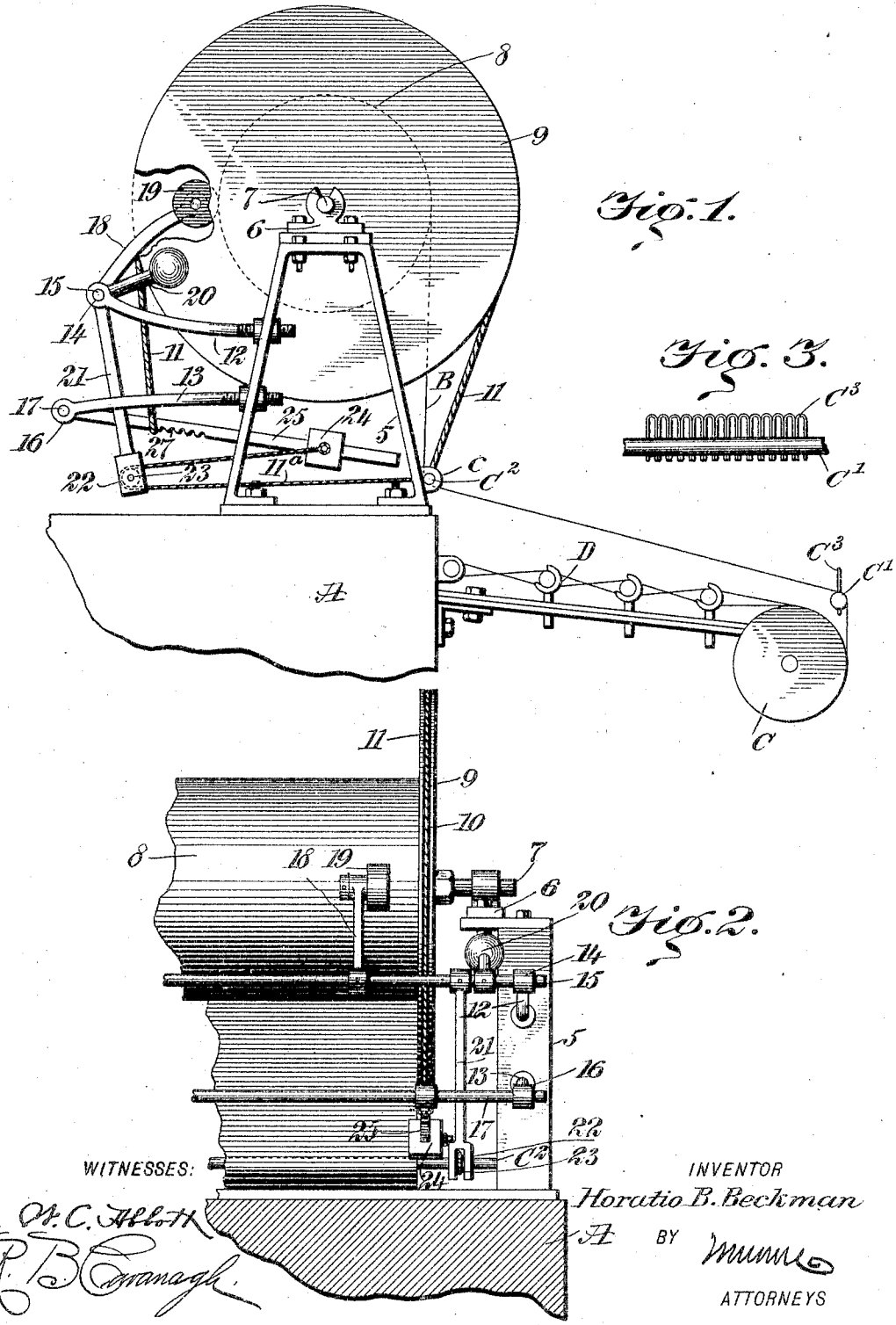


Fig. 1.

Fig. 3.

Fig. 2.

WITNESSES:

O. C. Elliott

R. B. Cranagh.

INVENTOR

Horatio B. Beckman

BY

ATTORNEYS

PHOTO LITHOGRAPHED BY SACKETT & WILHELMS LITHO. & PTG. CO. NEW YORK

No. 789,522. Patented May 9, 1905.

UNITED STATES PATENT OFFICE.

HORATIO B. BECKMAN, OF NEWBURGH, NEW YORK.

AUTOMATIC TENSION DEVICE FOR YARN-WINDING MACHINES.

SPECIFICATION forming part of Letters Patent No. 789,522, dated May 9, 1905.

Application filed September 17, 1903. Serial No. 173,538.

To all whom it may concern:

Be it known that I, HORATIO B. BECKMAN, a citizen of the United States, and a resident of Newburgh, in the county of Orange and State of New York, have invented a new and Improved Apparatus for Beaming Yarn with Cord, of which the following is a full, clear, and exact description.

My invention relates to means whereby cord may be wound simultaneously with coarse or fine yarn on a warp-beam which is to be used subsequently in a loom for weaving corded fabrics, whereby a single beam wound as contemplated by this invention may be used with the same effect in weaving corded fabrics as when the yarn and cord are beamed upon separate beams.

The prime object of this invention is to provide means entirely automatic in its action for winding cord-strands uniformly with yarn of either coarse or fine nature on warp-beams.

A further object is to provide a self-adjusting tension device which holds the cord-beam under restraint in such a way as to compensate for the increase in tension due to the decrease in the diameter of the beam on the unreeling of the cord therefrom, thereby holding the cord-strands under the required tension and insuring the uniform beaming of the cord with the yarn on the warp-beam, so that the yarn and the cord will be unreeled from the warp-beam in due proportions in the subsequent use of the materials in weaving a corded fabric.

A further object of the invention is to provide a device which is simple in construction, positive in operation, and capable of ready application to any yarn or cord winding machine.

Further objects and advantages of the invention will appear in the course of the subjoined description, and the actual scope thereof will be defined by the annexed claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a view in side elevation of a machine having my improvements applied thereto. Fig. 2 is a rear elevation of a portion of the machine, illustrating my improvements in operative position thereon; and Fig. 3 is a detail view of a comb through which the cord-strands are adapted to pass on the way from the cord-beam to the warp-beam.

In the drawings I have illustrated so much of an ordinary slasher as is necessary to an understanding of my invention. In said drawings, A designates a portion of the drying-box of an ordinary slasher, the same forming a table on which the cord-beam and the tension device of my invention are adapted to be mounted. A warp-beam is indicated at C, and between this warp-beam and the slasher is a plurality of lease-rods D, which are arranged to separate the yarn as it passes from the slasher to the beam C. As these devices form no part of the present invention, they need not be described in detail.

As a means for supporting the cord-beam 8 I employ a suitable number of brackets or supports 5, which are mounted on the drying-box of the slasher, as shown by the drawings. Each support or bracket 5 is provided at the upper portion thereof with a bearing 6, adapted to receive an end portion of the shaft 7, which carries the cord-beam 8. On this beam is wound a proper quantity of cord B, which is adapted to be drawn from the beam and wound on the warp-beam C simultaneously with the winding of yarn on said beam C; but to uniformly wind the cord with the yarn on said beam I find it necessary to provide a tension mechanism which will control the rotation of the cord-beam 8, said tension mechanism being self-adjusting to compensate for the increase in the tension of the cord due to the change in diameter of the beam 8 on the unwinding of the cord therefrom. I prefer to employ a tension device adjacent to each end of the cord-beam 8; but as the arrangement of the parts about to be described is the same at both ends of said cord-beam a description of the parts at one end of said beam will answer for both.

Each end of the cord-beam is provided with a head 9, in which is formed a circumferential groove or channel 10. (See Fig. 2.) A brake band or cable 11 fits snugly in the chan-

neled head, said band or cable having one end anchored in a suitable way to a part of the framework—as, for example, to the lug *c*, which is provided on the bracket or support 5. The other end of this brake band or cable is provided with a loop or eye having adjustable engagement with a lever 25, as will hereinafter appear.

15 designates a rock-shaft which is journaled in a suitable bearing 14, provided in the end portion of a fixed arm 12, the latter being shown as fastened to a part of the bracket or support 5 in a suitable way. This rock-shaft is provided with an upwardly-extending arm 18, which is equipped at its free end with a shoe or roller 19, that is loosely mounted on a bolt or pin fastened to said arm 18. The rock-shaft is furthermore provided with a weighted arm 20 and with a depending arm 21, the latter being forked or bifurcated at its lower portion, as at 22, for the reception of a guide sheave or roller 23, the latter being loosely mounted on a pin or arbor secured in the bifurcated portion 22 of said depending arm 21. Around the sheave or roller 23 passes a cord 11^a, one end of which is hitched or anchored to the framework—as, for example, to the bracket or support 5—while the other end of said cord is attached to a shiftable weight 24, that is mounted on the lever 25 for slidable movement thereon. I do not desire to confine myself to the employment of a doubled cord having one end hitched to the framework, because I am aware that the lever 21 may be connected by a cord directly with the shiftable weight; but the described construction and arrangement of parts is advantageous, because they are arranged in a very compact manner, and the sweep or arc of movement of the arm 21 is correspondingly reduced.

17 designates a rock-shaft which is arranged below and parallel to the rock-shaft 15, said shaft 17 having one end journaled in a suitable bearing 16, provided in a supporting-arm 13, which is shown by the drawings as being fastened to the bracket or support 5. It is evident, however, that the rock-shafts 15 and 17 may be supported in any suitable way preferred by the skilled constructor. This shaft 17 has one end of the lever 25 secured firmly thereto, so that the shaft will serve as the axis of movement of the lever-arm. Said lever is provided at a point intermediate of its length with a plurality of notches 27, in either of which may be fitted the loop or bight at the otherwise unconfined end of the brake band or cord 11, the latter being thus connected adjustably with the lever 25.

The cord B passes from the cord-beam 8 below a rod or roller C^2, which is mounted at a point above the lease-rods D and preferably below the cord-beam. From the guide formed by this rod or roller C^2 the cord passes between the teeth C^3 of a comb C', the latter being supported in a horizontal position above and to the rear of the warp-beam C, as shown by Fig. 1.

In the operation of my invention the yarn passes from the slasher to the lease-rods and then to the warp-beam C, while the strands of cord B are drawn from the cord-beam 8, so as to pass below the guide C^2, through the teeth of the comb C', and to the warp-beam C, the latter being rotated or driven in any suitable way, so as to wind the yarn and the cord simultaneously on said beam. The tension on the cord is secured by retarding the rotation of the cord-beam by the operation of the brake mechanism, which in this invention is embodied in the form of the strap or cable 11, having one end anchored at a fixed point, while its other end is attached to a weighted lever 25. The lever is depressed by the weight 24, which causes the lever 25 to pull on the brake band or cable 11, the latter having frictional engagement with a head 9 of the cord-beam, so as to retard the rotation thereof.

At the beginning of the operation of beaming the cord along with the yarn on the beam C the weight 24 is at or near the free end of the lever 25, so as to make the brake band or cable 11 exert the required friction on the cord-beam, the contents of which are adapted to be drawn quite easily and freely from the beam when it is fully wound. The roller or shoe 19 is held in contact with the cord of the beam 8 by the weighted arm 20, which actuates the rock-shaft 15, so as to hold the arms 18 and 21 in the required positions. When the cord-beam is fully wound, the operation of the warp-beam C has a tendency to easily turn the cord-beam, and it is necessary to make the tension device exert considerable friction on said cord-beam in order to restrain the cord from winding too freely and loosely on the warp-beam; but as the diameter of the cord-beam decreases, due to the unreeling of the cord therefrom, I find it important to decrease the tension on said beam 8, because the cord on a beam of small diameter cannot be drawn as freely by the warp-beam as when the cord-beam is fully wound and is of large diameter. This decrease in the tension is secured automatically in the present invention by the employment of the roller or shoe, the arm 21, and the cord 11, which is operatively connected with the weight 24.

It is evident that a decrease in the diameter of the body of cord wound on the beam will allow the roller or shoe 19 to be moved inwardly by the action of the weighted arm 20, as shown by Fig. 1, (which represents the cord-beam materially reduced in diameter by unwinding of cord therefrom.) This inward movement of the roller or shoe turns the rock-shaft 15, so as to swing the pendent arm 21 in an outward direction, and this movement

of the arm draws on the anchored cord 11ª, so as to shift the weight 24 lengthwise on the lever-arm 25, and thereby decrease the leverage of said arm 25 proportionately to the decrease in the diameter of the cord-beam, whereby the friction exerted by the lever 25 and the friction band or strap 11 is gradually decreased on the cord-beam, such decrease in the friction being proportionate to the decrease in the diameter of the cord-beam.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. An apparatus for preparing warp for weaving corded fabrics, having a warp-beam, means for supplying yarn to said beam, a cord-beam, means for guiding cord from said cord-beam to the warp-beam, and means for controlling the rotation of the cord-beam to secure uniformity of tension of the cord unreeled therefrom, the yarn and cord being wound simultaneonsly on one and the same warp-beam in equivalent lengths.

2. An apparatus for preparing warp for weaving corded fabrics, having a warp-beam, means for supplying the yarn thereto, a tension-controlled cord-beam operable to supply cord under regulated tension to said warp-beam, and means for directing cord from the cord-beam to paths adjacent to the yarn for winding the yarn and cord simultaneously on the warp-beam.

3. An apparatus for preparing warp for weaving corded fabrics, having a warp-beam, means for supplying yarn thereto, a tension-controlled cord-beam, and a comb in operative relation to the warp-beam and disposed to direct cord from said cord-beam in paths adjacent to the individual strands of yarn for simultaneously winding the yarn and the cord on the warp-beam.

4. In an apparatus for preparing a warp-beam for weaving corded fabrics, the combination of a warp-beam, means for directing yarn thereto, a cord-beam, a comb mounted adjacent to the warp-beam and arranged to direct cord from the cord-beam in paths parallel to and alongside of the yarn, for simultaneously winding the yarn and cord in parallel strands on the warp-beam, and an automatic brake mechanism for retarding the rotation of the cord-beam proportionately to the changing diameter of the cord thereon.

5. In an apparatus for preparing a warp-beam for weaving corded fabrics, the combination with a cord-beam, of a brake-lever having coöperative relation to the cord-beam, a shiftable weight connected to said lever, a counterbalanced arm having means held normally by said arm in engagement with the cord-beam, and an intermediate connection between the counterbalanced arm and the shiftable weight, said counterbalanced arm constituting means for adjusting said connection.

6. In an apparatus for preparing a warp-beam for weaving corded fabrics, the combination with a cord-beam, of a brake-lever having coöperative relation to said cord-beam, a weight shiftably mounted on the lever, a pivoted arm having means for riding against said cord-beam, a counterbalance tending to normally press the arm toward the cord-beam, and a direct connection between the arm and the weight.

7. An apparatus of the class described, having a warp-beam, a cord-beam mounted to supply cord to said warp-beam, a friction-brake in operative relation to said cord-beam, a lever connected with said brake and having a shiftable weight, a rock-shaft provided with a weighted arm and with a depending arm, another arm fast with the rock-shaft and provided with means arranged to ride against the cord-beam, and a cord anchored at one end, connected loosely with the depending arm and attached to the shiftable weight.

8. An apparatus for simultaneously winding yarn and cord on the same beam, comprising a cord-beam, and means for regulating the tension of the cord proportionately to the diameter of the body of cord on the cord-beam, comprising a brake for the cord-beam, a pivoted lever having a shoe arranged to ride against the cord on the cord-beam, and a depending arm having means for controlling said brake.

9. An apparatus for preparing warp for weaving corded fabrics, comprising a warp-beam, means for supplying yarn thereto, and means for simultaneously supplying cord to said beam at an equivalent rate to that at which the yarn is supplied thereto.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HORATIO B. BECKMAN.

Witnesses:
L. DICKERSON,
W. T. CASSEDY.