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2,725,613

BEAMING DEVICE

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2 Sheets-Sheet 1

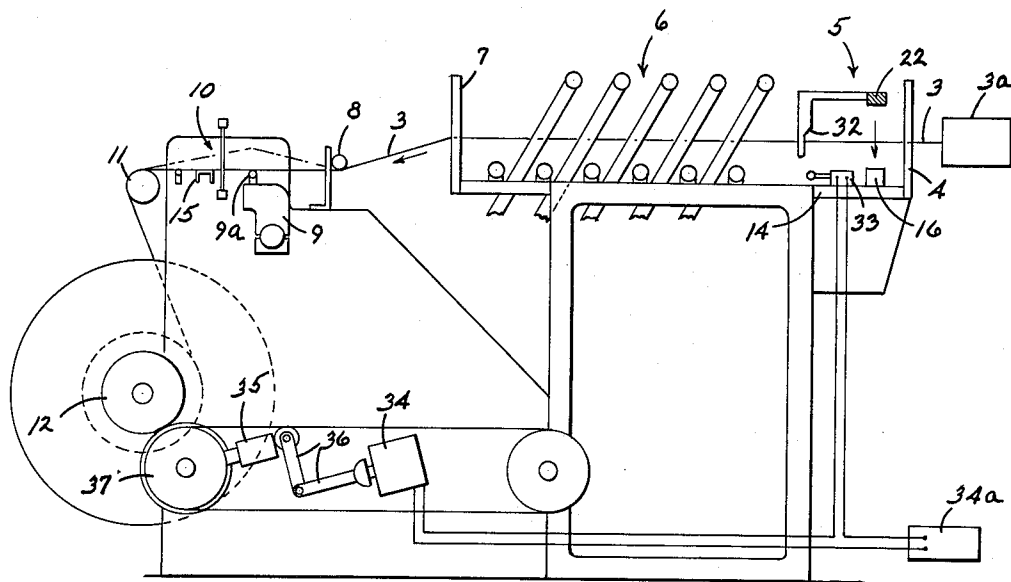


Fig. 1

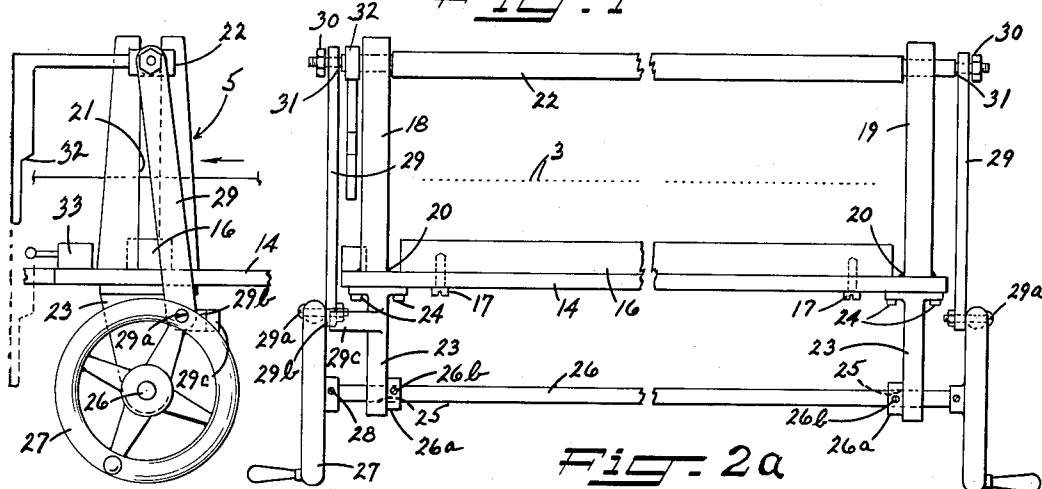


Fig. 2a

Fig. 2

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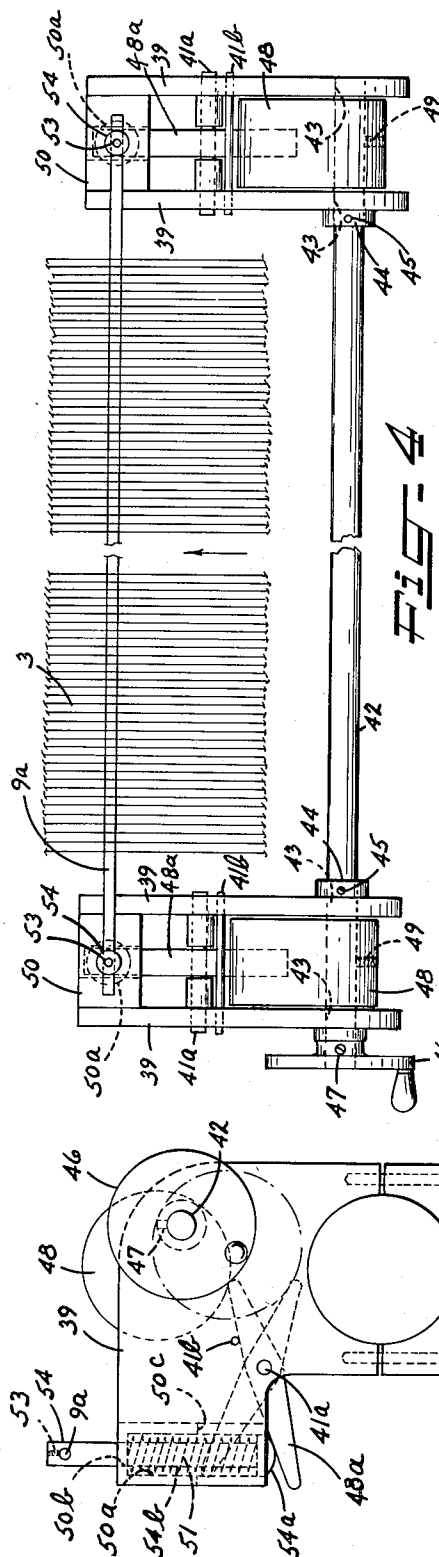


FIG. 3

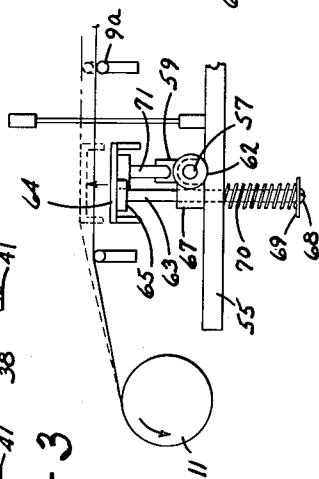


FIG. 5

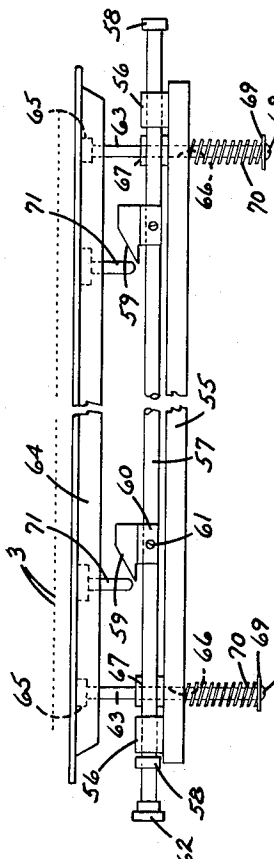


FIG. 6

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BEAMING DEVICE

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3 Claims. (Cl. 28—32)

This invention relates to warp beaming apparatus and more particularly to devices which are adapted to clamp and tension a warp of yarn and to thereby facilitate the taping of its ends preliminary to the doffing of a full beam.

Upon completion of the winding operation in the preparation of a beam of yarn it is necessary to provide a means for retaining the adjacent ends or yarns of the warp in their proper positional relationship when the threads are severed and packaged for shipment. The common practice is to maintain the strands of the warp in their proper relative position by applying a pair of adhesive strips to opposite sides of the warp and across the width thereof. In this way, when the warp is unwound from the beam at the customers' mill, there is no difficulty in finding each of the numerous warp strands. This taping operation, however has been in the past a relatively tedious manual operation wherein considerable difficulty has been experienced in properly and accurately applying the tape to the warp to thereby preserve its strand pattern.

It is a principal object of the present invention to provide novel and improved apparatus which facilitates the application of tape across the width of the warp.

Other objects and advantages of the present invention will be apparent from the following description.

In general the present invention comprises a clamping device which extends across the full width of the warp, means for braking the beamer, means for tensioning the warp between the clamping means and the beamer braking means, and a taping device which is adapted to be moved upwardly toward the tensioned portion of the warp to apply a strip of adhesive material thereto. It has been found that with such apparatus the tape-up operation may be more readily and accurately performed.

In the drawing which is illustrative of the invention, Figure 1 is a diagrammatic side view of a beamer in accordance with the present invention;

Figure 2 is an enlarged fragmentary view of the clamping device shown in Figure 1;

Figure 2a is a side view of the clamping device shown in Figure 2;

Figure 3 is an enlarged detail showing a preferred embodiment of the warp tensioning device of Figure 1;

Figure 4 is a top view of the tensioning device of Figure 3;

Figure 5 is an enlarged detail showing a preferred embodiment of the taping device of Figure 1; and

Figure 6 is a side view of the taping device of Figure 5.

As illustrated in Figure 1 of the drawing, the warp or yarn 3 proceeds from a source such as a plurality of packages on a creel 3a shown diagrammatically on the drawing, through the eyeboard 4, between the normally open jaws of the clamping device 5, between the rollers of back-winding yarn-storage device 6 (when such a device is used) through the eyeboard 7, under the guide roller 8, over the elongated rod 9a of the tensioning device 9, through the comb 10, above the tape-applying

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device 15, around the measuring roller 11, and finally about the beamer 12.

The clamping device 5 is shown in greater detail in Figures 2 and 2a of the drawing. As illustrated therein the elongated transverse supporting plate 14 extends beneath and transverse to the path of the strands of warp 3 and may be mounted on the frame of the machine in any convenient manner. The elongated stationary clamp bar 16 is secured by the cap screws 17 to the upper surface of plate 14. The guide members 18 and 19 are also secured, preferably by welding as shown at 20 in the drawing, to the upper surface of plate 14, and extend upwardly from opposite end portions thereof. Each guide member includes an elongated slot 21 which extends downwardly substantially the full length thereof and is thereby adapted to slidably accommodate the movable clamp bar 22 as will be more fully described hereinafter. Journal members 23 are secured to the underside of the supporting plate 14 preferably by the cap screws 24 and extend downwardly therefrom. Apertures 25 which pass through the lower extremities of the journal members 23 are adapted to rotatably receive the operating shaft 26. Collar members 26a are affixed to the shaft by means of the set screws 26b and are positioned thereon adjacent each of the journal members 23 to restrict longitudinal movement of the shaft. A hand wheel 27 is secured to one or both extremities of the shaft by the set screw 28 and thereby provides a convenient means for rotating the shaft. Connector links 29 are pivotally secured at one end to the periphery of the hand wheels 27 by the pins 29a and at the other end to the extremity of the movable clamp bar 22. The nuts 30 threadedly engage complementarily threaded end portions of the movable clamp bar to confine the links between the nuts and the shoulders 31 on the movable clamp. In this way, when either hand wheel is operated, the links 29 cause the movable clamp to move in the guide member slots toward or away from the stationary clamp bar thereby permitting the strands of the warp to be clamped therebetween.

As shown in Figure 2 of the drawing the clamping device is preferably designed such that when the device is in its normally open position the pivot pins 29a whereby the links 29 are fastened to the periphery of their associated hand wheels 27 are located beyond the vertical center line between the axes of the shaft 26 and the movable clamp 22. In this way the protrusion 29b of link 29 rests against the stop 29c to conveniently maintain the device in its open position until the handwheel is rotated in a counterclockwise direction.

Cam 32 is suitably secured to the movable clamp bar 22 and extends outwardly and downwardly therefrom so that when the clamp bar is moved to its lowermost position the cam member contacts and closes the limit switch 33.

As shown in Figure 1 the limit switch 33 is inserted in series with the beamer brake-operating solenoid 34 and an electrical energy source 34a shown diagrammatically on the drawing such, that when the switch is actuated, the circuit for energizing the solenoid is closed and the brake shoe 35 is operated through the linkage 36 to frictionally contact the driving mechanism 37 for the beamer. Thus, when the clamping device is actuated so as to clampingly engage the strands of the warp, the beaming device is simultaneously braked.

The back-winding storage device 6 shown diagrammatically in Figure 1 of the drawing may take a variety of different forms or may be omitted if desired. Therefore, a full description thereof is omitted for the sake of simplicity as it forms no part of the present invention. For further details of suitable apparatus for this purpose, reference may be had to the Bauer et al. U. S. Patent No. 2,558,033.

The warp tensioning device 9 is shown in detail in Figures 3 and 4 of the drawing. As illustrated therein the support means for the tensioning device which includes an elongated shaft 38 and which extends beneath and transverse to the path of the warp strands may be affixed to the frame of the machine in any suitable manner. A pair of L-shaped side plates 39 are adapted to be secured adjacent each end of the elongated shaft in any convenient manner such as by the clamp members 40 shown in Figure 3 wherein the extremity of the vertical leg of each of the L-shaped side plates 39 and the clamp members 40 frictionally contact the shaft 38 when the associated cap screws 41 are tightened.

The operating shaft 42 of the tensioning device extends through an aperture 43 adjacent the apex of each of the L-shaped plates. Collar members 44 are affixed to the shaft 42 by means of the set screws 45 and are positioned thereon adjacent the inner surface of each pair of side plates so as to restrict the longitudinal movement of the shaft 42. Hand wheel 46 may be secured to either extremity of the shaft 42 by any convenient means such as by the set screw 47 shown in Figure 4 of the drawing. Between each pair of side plates 39 a cam member 48 is eccentrically mounted on the shaft by the set screws 49. A pivot pin 41a extends between each pair of side plates 39 and rotatably supports the actuating lever 48a which is actuated when the hand wheel 46 and the cam member 48 are rotated. The pins 41b which also extend between each pair of side plates provide means for limiting the counterclockwise movement of the associated lever 48a.

The plunger housing member 50 is positioned and affixed between the upper portions of each pair of side plates and provides greater rigidity to the structure. A bore 50a and an aperture 50b in each housing 50 are disposed generally parallel to and equidistant from the abutting surfaces of the adjacent associated side plates. Each plunger member 54 includes a head portion 54a which slides freely in the corresponding bore 50a and a shank portion 54b which extends through the corresponding aperture 50b. Each of the plungers 54 is provided with a biasing coil spring 51 which is positioned about the shank of the plunger between the head portion thereof and the base of the bore 50a.

The outer portion of the shank 54b includes an aperture which extends generally transversely to the axis thereof and is adapted to receive the tensioning bar 9a. The set screws 53 provide a means for fixedly securing each plunger to the bar 9a. The head portion 54a of the plunger is adapted to be contacted by the lever 41 when the hand wheel 46 is rotated as will be more fully described hereinafter.

Thus it is seen that, when the hand wheel 46 and the operating shaft 42 are rotated, the cam members 48 are likewise rotated, the levers 48a are pivoted about their respective pivot pins 40, the plunger 54 is actuated against the bias of the coil spring 51 and the tensioning bar 9a is moved upwardly to engage and tension the various strands of the warp.

The tape-applying device is shown in detail in Figures 5 and 6 of the drawing. As illustrated therein the plate 55 extends beneath and transverse to the path of the warp strands and may be mounted on the frame of the machine in any convenient manner. The bearing members 56 are secured to the upper surface of the plate 55 and are adapted to slidably receive the elongated operating shaft 57. The collar members 58 are secured to the shaft adjacent its extremities to limit the longitudinal movement thereof. Cam members 59 are also affixed to the shaft in any convenient manner such as by the sleeves 60 and the set screws 61. The knob 62 may be secured to either end of the shaft 57 as shown to facilitate the movement thereof. The elongated tape supporting channel 64 is positioned generally parallel to the major axis of the plate 55 between the same and the strands of the warp. Tape channel guide pins 63 are suitably secured as by welding to

the underside of the channel 64 and extend downwardly therefrom. The pins are preferably enlarged as at 65 adjacent their juncture with the channel 64 to provide added rigidity thereto. The pins 63 extend through the apertures 66 and the bosses 67 on the plate 55 and are internally threaded at their extremities to receive the machine screws 68 and the associated washer 69. Coil springs 70 surround the pins 63 between the bottom surface of the plate 55 and the associated washer 69 to normally bias the channel member toward its lowermost position. The pin members 71 are also secured as by welding to the underside of the channel member 64 and extend downwardly therefrom. These pins are also preferably enlarged adjacent the juncture of the channel member to provide added rigidity thereto. The pin member 71 and the cams 59 are suitably positioned so that they cooperate when the operating shaft 57 is actuated to lift the tape channel 64 against the biasing springs 70. In this way a strip of adhesive material which has been placed on the channel member with its adhesive side up may be conveniently applied to the underside of the strands of the warp.

In describing the operation of the tape-up machine in greater detail it will be assumed that the beamer 12 has been fully wound. The operator, first, rotates the hand wheel 27 of the clamping device 9 and thereby causes the movable clamp bar 22 to move downwardly toward the stationary clamp bar 16 to firmly engage the strands of the warp therebetween. Simultaneously the cam 32 actuates the limit switch 33 and the solenoid 34 is energized to hold the beam 12. Thus, the strands of the warp are firmly anchored on either side of the tensioning and taping devices. Next, the operator rotates the hand wheel 46 of the tensioning device thereby causing the cam member 48 to actuate the lever 41 and the plunger 54 and to move the tensioning bar 9a upwardly against the strands of the warp. In this way slack in any of the warp strands between the clamping device and the beamer is eliminated and the spacing between individual strands which is determined by the eyeboards 4 and 7 and the comb 10 is accurately maintained. Next, the operator pulls the knob 62 of the taping device 15 thereby causing the cam members 59 to contact the pins 71, the taping channel 64 to move upwardly and the strip of adhesive to be applied to the underside of the warp strands. Next, a second strip of tape with its adhesive face down is manually applied to the upper surface of the warp strands adjacent the previously applied strip of tape by means of a roller or the like. Thus, the channel member 64 also provides a convenient rigid support for the application of the second strip of tape. Finally the strands of the warp may be severed between the taped portion thereof and the clamping device, the full beam may be replaced by an empty one, and severed strands of the warp properly wrapped thereabout before the clamping device 5 is relaxed. The winding, taping, and removal of successive beams may then be similarly repeated.

While preferred embodiments of the invention have been disclosed, the description is intended to be illustrative only and it is to be understood that changes and variations may be made without departing from the spirit and scope of the invention as defined by the appended claims.

I claim:

1. In warp beaming apparatus a beam, a source of warp yarn for winding onto said beam, a yarn clamping device comprising a supporting plate, a stationary clamp member secured to the upper surface of the supporting plate, a guide member which is secured to one end of the supporting plate and extends upwardly therefrom, another guide member which is secured to the other end of the supporting plate and extends upwardly therefrom, each of the guide members including a downwardly extending slot, a movable clamp member which includes reduced end portions that are adapted to slide in the guide mem-

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ber slots, a pair of journal members which are secured to the bottom surface of the supporting plate and extend downwardly therefrom, an operating shaft rotatably mounted on the journal members, means for facilitating rotation of the operating shaft, and means for varying the position of the movable clamp member in the guide member slots upon rotation of the operating shaft.

2. In warp beaming apparatus a beam, a source of warp yarn for winding onto said beam, a yarn clamping device comprising a supporting plate, a stationary clamp member secured to the upper surface of the supporting plate, a guide member which is secured to one end of the supporting plate and extends upwardly therefrom, another guide member which is secured to the other end of the supporting plate and extends upwardly therefrom, each of the guide members including a downwardly extending slot, a movable clamp member which includes reduced end portions that are adapted to slide in the guide member slots, a pair of journal members which are secured to the bottom surface of the supporting plate and extend downwardly therefrom, an operating shaft rotatably mounted on the journal members, a handwheel secured to each end of the operating shaft, and a link connecting the periphery of each handwheel and the adjacent end of the movable clamp member whereby upon rotation of the operating shaft the position of the movable clamp member may be varied.

3. Warp beaming apparatus comprising a warp beam,

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a source for a warp of yarn, a warp clamping device located between the warp source and the beam, means for closing said warp clamping device to securely lock the warp yarn, a brake actuated by the clamping device in its warp engaging position to restrain movement of the beam, means including a movable bar extending transversely of the warp, means for moving said bar against the warp when the warp is tensioned between the clamping device and the braked beam to displace the warp yarns and increase the tension thereon, and a tape-applying device located between the bar and the beam.

References Cited in the file of this patent

UNITED STATES PATENTS

1,019,332	Mathewson	Mar. 5, 1912
1,741,757	Colman	Dec. 31, 1929
1,790,553	Peterson	Jan. 27, 1931
1,940,476	Abbott	Dec. 19, 1933
2,098,418	Francis	Nov. 9, 1937
2,324,612	Lambach	July 20, 1943
2,371,620	Hartung	Mar. 20, 1945
2,446,580	Garden	Aug. 10, 1948
2,491,438	Bodansky	Dec. 13, 1949
2,534,896	Bodansky	Dec. 19, 1950
2,558,033	Bauer et al.	June 26, 1951
2,579,322	Keith et al.	Dec. 18, 1951