July 25, 1961 B. R. FRIEND ET AL 2,993,259

APPARATUS FOR WARP BEAMING

Filed Nov. 29, 1956 2 Sheets-Sheet 1

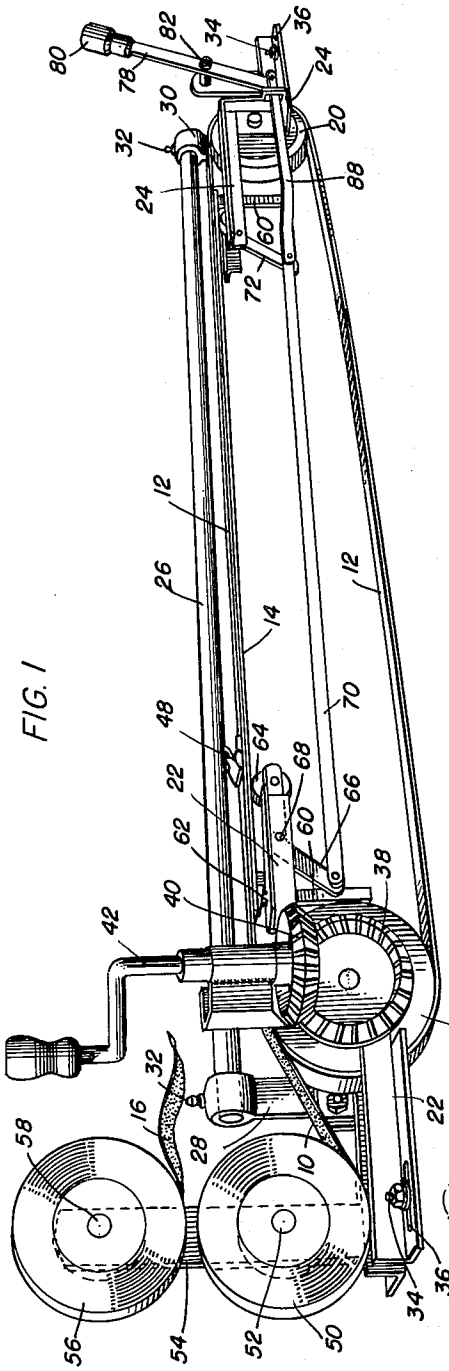

FIG. 1

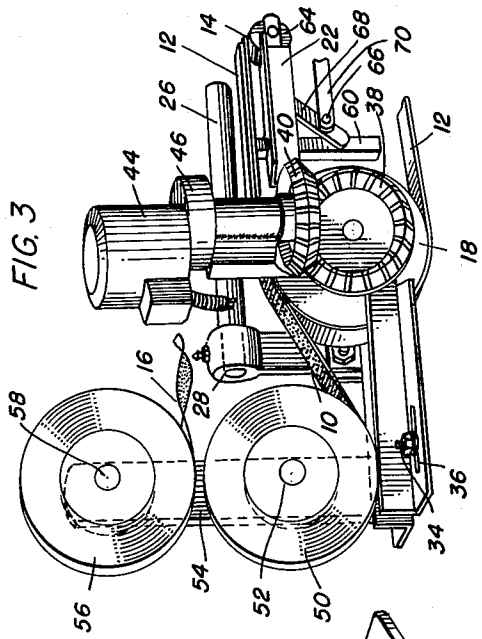

FIG. 3

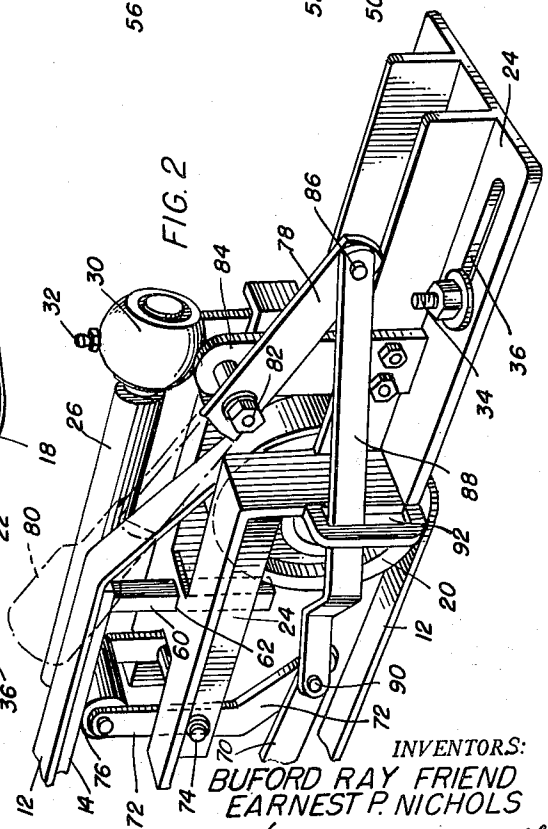

FIG. 2

INVENTORS:
BUFORD RAY FRIEND
EARNEST P. NICHOLS
BY Kent M. Worrell
ATT'Y

July 25, 1961 B. R. FRIEND ET AL 2,993,259

APPARATUS FOR WARP BEAMING

Filed Nov. 29, 1956 2 Sheets-Sheet 2

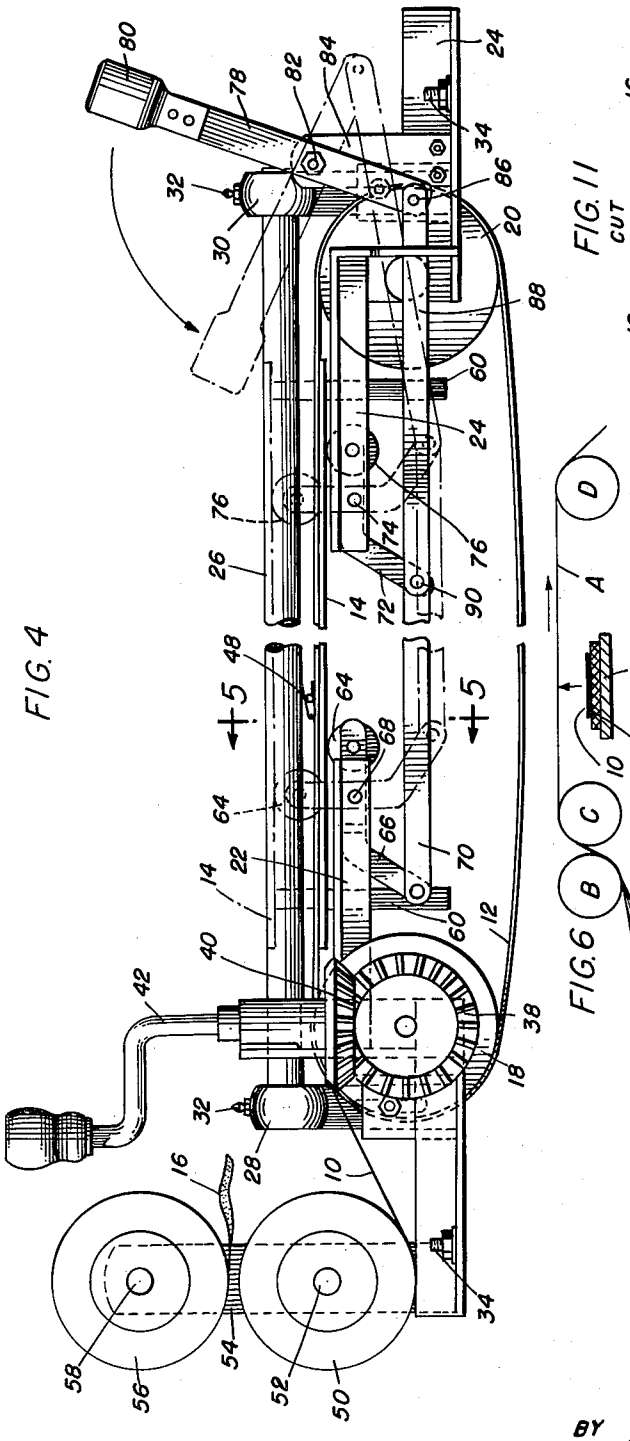

FIG. 4

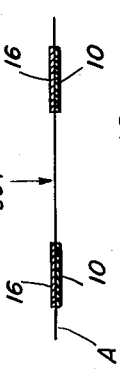

FIG. 11

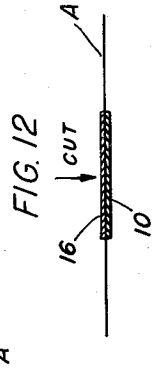

FIG. 12



FIG. 6

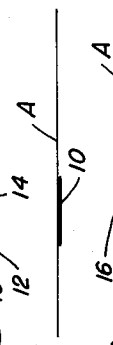

FIG. 7

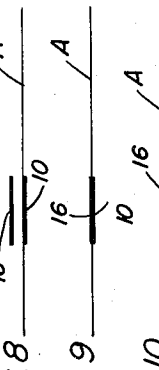

FIG. 8



FIG. 9

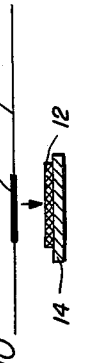

FIG. 10

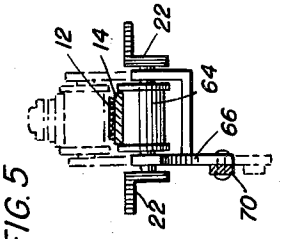

FIG. 5

INVENTORS:
BUFORD RAY FRIEND
EARNEST P. NICHOLS

BY Kent W. Worrell
ATT'Y

United States Patent Office

2,993,259

Patented July 25, 1961



2,993,259

# APPARATUS FOR WARP BEAMING

Buford Ray Friend and Earnest P. Nichols, Fries, Va., assignors to Mystik Adhesive Products, Chicago, Ill., a corporation of Illinois

Filed Nov. 29, 1956, Ser. No. 625,091
13 Claims. (Cl. 28—32)

This invention relates in general to a warp beaming method and an apparatus therefor as more particularly described as a method and apparatus adapted to engage and hold a warp of yarn or thread and to tape ends in taking off a full beam or dividing it into separated parts.

When the winding operation in preparing a beam of yarn is completed, means is provided for retaining and holding the adjacent ends of yarns of the warp in their proper spaced relation when the threads are cut and packaged for separate use or shipment. This is commonly effected by applying adhesive strips on opposite sides of the warp extending across the full width thereof. When the warp is unwound from a beam by the customer, all of the warp threads are separated and maintained in place for use by a customer.

In the past, this taping has been a tedious and time consuming manual operation in quickly and accurately applying the tape across the warp at the cut ends to maintain the strand pattern.

An important object of the present invention is to provide an improved novel apparatus and a method for applying tape across the width of the warp.

A further object of the invention is to provide an apparatus operable from one side of the warp for projecting a tape transversely thereof to the other side.

A still further object of the invention is to provide power apparatus for projecting a fastening tape across the warp of threads to be connected.

Other objects of the invention will appear in the specification and are apparent from the accompanying drawings in which,

FIG. 1 is a perspective view of a warp beaming apparatus for carrying out an improved method of leasing in accordance with this invention.

FIG. 2 is a perspective view of the right end of the apparatus shown in FIG. 1 in a tape raising position.

FIG. 3 is a perspective view of the left end of the apparatus shown in FIG. 1 with an operating motor instead of a manual crank.

FIG. 4 is an elevational view of the apparatus in FIG. 1 illustrating the operation thereof.

FIG. 5 is a sectional view of the apparatus in an operating position as shown on the line 5—5 of FIG. 4.

FIG. 6 is a somewhat diagrammatic view showing the method of applying a tape to the under side of the warp.

FIGS. 7, 8, 9 and 10 are somewhat diagrammatic views illustrating the application of tapes at one and both sides of the warp.

FIG. 11 is a fragmentary view illustrating one method of connecting the warp threads by two sets of tapes and cutting between them; and

FIG. 12 is a fragmentary view illustrating the application of a single set of tapes to opposite sides of a warp and cutting lengthwise through the tapes to sever the warp.

This invention comprises a belt device which extends transversely under the full width of the warp having means for operating the belt and a pick-up to engage a tape for moving it from one side to the other with means for bodily moving the tape in contact with the warp threads and adhesively binding the warp threads in spaced relation by one or more strips of tape at any desired location for facilitating the cutting of the warp threads and maintaining them in proper relative positions.



Referring now more particularly to the drawings, a plurality of warp yarns or threads A are represented in FIG. 6 as passing about guide rods B and C and over a space guide rod D. In order to maintain the warp threads in their relative position transversely of the beam and for securing the ends of cut threads together, an adhesive tape **10** as shown in FIG. 7 is applied to the under side of the warp threads by means of a movable belt **12** and a pressure bar **14** as represented in FIG. 6. Either before or after the adhesive **10** is applied at the bottom of the warp threads, an upper adhesive tape **16** may be applied over the top of the threads as shown in FIG. 8 and compressed thereon as represented in FIG. 9, the compression of the two together being against the belt **10** backed by the pressure bar **14** when in raised position, holding the belt against the under side of the warp threads and shown withdrawn therefrom in FIG. 10.

With the adhesive tapes applied in this manner, two pairs of adhesive tapes **10** and **16** may be applied transversely of the warp threads A at a relatively close distance so that the threads between the two sets of tapes may be cut transversely of the threads as represented in FIG. 11, thus binding the adjacent warp yarn or thread extremities together for subsequent use.

As shown in FIG. 12, a single set of tapes **10** and **16** may be applied above and below the warp threads A and a cut may be made longitudinally and centrally of the tape so that the cut ends of the tape will be adjacent the extremities of the cut threads.

To project an adhesive tape **10** below a web of warp threads which may be of considerable width, the belt **10** is mounted at its ends for reciprocating movement upon pulleys **18** and **20**. One of the pulleys **18** is mounted upon a supporting frame **22** at one side of the web and the other pulley **20** is mounted upon a supporting frame **24** at the other side of the web. These two frames are accurately spaced apart and held in any adjusted position by a rod **26** adjustably secured at its ends in bearings **28** and **30** by said screws **32** adjustable in the top thereof. The supporting frames **22** and **24** are also adjustably mounted at the sides of a warp beaming apparatus to which it is applied by said screws **34** adjustable in slots **36** adapted to be inserted into a suitable supporting part of the beaming apparatus.

With the belt and pulleys thus mounted and spaced apart at opposite sides of the warp web, a gear **38** is secured to one of the pulleys **18** and has a driving pinion **40** engaging the gear for rotating it in opposite directions. This movement may be effected manually by means of a crank **42** secured to the pinion or by means of an electric motor **44** and a reduction gear connected to the pinion as shown in FIG. 3.

In projecting the tape **10** below the warp web, a fastening clip **48** is attached to the belt and is adapted to engage the end of a strip of tape **10** and to draw it from a roll **50** of the tape mounted upon a pin **52** projecting from a standard **54** extending upwarly from the supporting frame **22**. The end of the tape is gripped by the clip **48** and the belt is moved by the gear and pinion connected to the roller **18** to loosen the tape from the roll **50** and to carry the tape with its protected (non adhesive) side downwardly across to the other side of the web on top of the pressure bar **14** which extends from one supporting frame to the other.

At the upper end of the standard **54** is another roll of tape **56** mounted for rotation upon a pin **58** secured to the standard and a strip **16** of this tape is easily carried over the top of the warp web to the opposite side thereof. This length of tape is pulled from the roll **56** and inverted so that the adhesive side is downward so that when applied over the warp threads and pressed downwardly

against them opposite the tape **10**, the threads will be sealed together between the tapes **10** and **16** as represented in FIGS. 9 and 10.

In order to mount and apply the pressure bar **14**, it is provided at each end with a guide pin **60** which extends through a suitable hole **62** in the supporting frames **22** and **24** for guiding it in an up and down movement, between and under the upper reach of the belt **12**.

One end of the pressure bar **14** is engaged at its under side by a roller **64** mounted in a lever **66** upon a pivot **68** intermediate its ends secured in the frame **22**. The other end of the lever is connected by a link **70** with one end of a similar lever **72** having a pivot **74** intermediate its ends supported by the frame **24** and with a roller **76** at the other end of the lever which engages the under side of the adjacent end of the pressure bar **14**.

Connected to the link **70** at one end thereof and shown as connected to the end opposite the crank **42** is a lever **78** having a handle **80** at one end, mounted upon a pivot **82** intermediate its ends, the pivot supported by an upright standard **84** secured to the frame **24** and having its lower end connected by a pivot **86** with one end of a link **88**, the other end of which is connected by a pivot **90** with the adjacent end of the connecting link **70**.

The handle operating lever **78** is movable from an upright position as shown in full lines in FIGS. 1 and 4 in which case the rollers **64** and **76** at the under side of the pressure bar **14** are in their lowermost positions to an inclined position as indicated in broken outline in FIG. 4 and in full lines in FIG. 2 in which the rollers **64** and **76** are in their raised position engaging and elevating the upper reach of the belt **12** to slightly distort or extend the belt as shown in FIG. 2 so that the belt and any tape **10** thereon will be pressed against the under side of the warp threads and thereby to adhesively secure them together in spaced relation.

After the lower length of tape **10** is thus forcibly applied at the bottom of the warp strands, a length of tape **16** is manually drawn from the upper roll **56**. This length of tape is inverted so that the adhesive side is turned downwardly and the upper tape **16** is pressed against the warp strands and against the lower tape **10** so that the strands are adhesively secured tightly between the lower and upper adhesive tapes.

If it is desired to cut the warp threads to separate one length of the warp from another, two sets of tapes may be applied as shown in FIG. 11 with a transverse cut between them or a single tape may be applied as shown in FIG. 12 and a cut is made longitudinally and centrally of the tapes to secure the ends of the opposite warp strands together.

If desired, the pressure bar raising lever **78** may also be located at the same end as the belt operating means where it would be connected and operated in the same manner, but for clearness it is shown mounted at the opposite end of the belt and the link **88** and preferably extends through a slot **92** in the frame to confine the parts in place and to limit their operative movement.

With this construction, the tape is projected manually or by means of a motor which would operate in both directions to move the fastening clip **48** which is preferably secured to the belt **12** in one direction to project the tape **10** to the opposite side of the warp. The tape may be disengaged from the fastening clip **48** either before or after the tape is applied to the under side of the warp threads, the fastening clip **48** being ordinarily positioned beyond the end of the pressure bar or beyond the edge of the warp if it does not extend the full length of the bar. This construction is thus operated by power to project the adhesive tape across underneath a web in a quick and efficient manner so that a number of individual sections of the warp may be cut from a larger length thereof and the extremities of the warp threads quickly and securely fastened together for further individual actions and operation upon the warp sections.

While the method and a preferred construction for carrying out the method have been described in some detail, it should be regarded by way of illustration and example rather than a restriction or limitation thereof, as changes in the method and in the construction, combination and arrangement of the parts may be made without departing from the spirit and scope of the invention.

We claim:

1. In warp beaming apparatus for winding yarn having the warp extending longitudinally, means for supporting a supply of adhesive tape at one edge of the warp, means to engage the end of the tape, draw it from the supply, and move a length thereof transversely of and under the warp, and means to apply the adhesive side to the under side of the warp.

2. In warp beaming apparatus for winding yarn having the warp extending longitudinally, means for supporting a supply of adhesive tape at one edge of the warp, means to engage one end of the tape, draw it from the supply, and move a length of it to a position extending transversely of the warp at the under side thereof, and pressure means to apply the adhesive side of said length of the tape to the under side of the warp.

3. In warp beaming apparatus for winding yarns having the warp extending longitudinally, means for supporting a supply of adhesive tape having one non-adhesive side at one edge of the warp, a belt for engaging one end of the tape to draw it from the supply and moving a length of it to a position extending transversely to the other edge of the warp at the under side thereof with the adhesive side uppermost, and means to engage the non-adhesive side of the tape to press the adhesive side upwardly against the under side of the warp.

4. In warp beaming apparatus for winding yarn having the warp extending longitudinally, means for supporting a supply of tape having adhesive at one side disposed at one edge of the warp, means including a member movable transversely of the warp at one side thereof, a clamp secured to the member for engaging one end of the adhesive tape from said supply and moving it with said member to a position extending transversely of the web to the other side of the warp, and means to engage the non-adhesive side of the tape and to press the adhesive side thereof against the adjacent side of the warp for holding the threads thereof relatively in place.

5. In warp beaming apparatus for winding yarns having the warp extending longitudinally, means for supporting a supply of adhesive tape at one edge of the warp, means including a reciprocable belt and a clamp thereon for engaging one end of the adhesive tape to move it endwise from said supply and to a position extending transversely of the warp at the under side thereof, and a pressure bar located below the belt which carries the tape and is movable to press the belt with the tape thereon to press the adhesive side against the under side of the warp for binding the threads together.

6. In an apparatus in accordance with claim 5, the belt being mounted upon pulleys at opposite sides of the warp, and power means for rotating the belt in opposite directions.

7. An apparatus in accordance with claim 5, in which the upper reach of the belt is located below the warp, a pressure bar mounted below the upper reach of the belt, and means operated from one edge of the warp for raising the pressure bar to engage the upper reach of the belt and pressing the adhesive side of the tape against the under side of the warp.

8. An apparatus in accordance with claim 7, comprising means at opposite ends of the pressure bar for limiting the movement of the bar to a vertical direction.

9. In an apparatus in accordance with claim 6, in which the pulleys are mounted in supporting frames at

opposite sides of the warp, the belt tending to draw the frames together, and a bar adjustably connected at each end to one of the supporting frames for rigidly spacing the frames apart and maintaining the belt in engagement with the pulleys.

10. In an apparatus in accordance with claim 7, means comprising pivoted levers in a frame at each end of the pressure bar with one end for engaging the under side of the bar, the other end of each lever being connected by a link, and operating means in the frame at one end of the bar comprising a pivoted lever and a connection therefrom to the said link for operating the two levers connected by the link in raising and lowering the pressure bar.

11. In warp beaming apparatus for winding yarn having the warp extending longitudinally, means forming a supporting frame at each edge of the warp, means for supporting a roll of tape having an adhesive at one side on one of the supporting frames, a pulley pivoted in each of the opposite supporting frames, a belt connecting the two pulleys, means comprising a rigid bar adjustably connected to the opposite supporting frames for holding them in spaced relation, a pressure bar mounted at its ends in the supporting frames for movement against the upper reach of the belt, means in connection with one of the pulleys for driving the belt in opposite directions, a fastening clip secured to the belt for engaging the end of a strip of adhesive tape from a roll thereof mounted on the supporting frame and carrying the tape transversely across the warp threads at the under side thereof,



means in connection with one of the supporting frames and including a link and lever connection with rollers for engaging the opposite ends of the pressure bar at the under side thereof and raising it with the upper reach of the belt to press the adhesive side of a tape carried by the belt in engagement with the under side of the warp for adhesive attachment thereto.

12. In warp beaming apparatus in accordance with claim 11, a power motor attached to the driving means for the belt for moving the belt and the clip attached thereto in opposite directions along the path below the upper reach of the belt.

13. In a warp beaming apparatus in accordance with claim 12, the supporting frame at one edge of the warp having a support for another roll of tape which is adhesive on one side thereof, this tape being located above the level of the warp threads so that a tape unwound from the roll may be inverted and passed over the warp and pressed downwardly in engagement with the warp threads and the tape carried by the belt at the under side of the warp threads.

**References Cited** in the file of this patent

UNITED STATES PATENTS

| | | |
|---|---|---|
| 1,478,082 | Whitlock | Dec. 18, 1923 |
| 2,446,580 | Garden | Aug. 10, 1948 |
| 2,595,778 | Duckoff | May 6, 1952 |
| 2,725,613 | Bauer | Dec. 6, 1955 |
| 2,786,257 | Bauer | Mar. 26, 1957 |