O. E. HECKMAN.

CROSS WRAPPING MACHINE.

APPLICATION FILED MAR. 7, 1916.

1,215,934.

Patented Feb. 13, 1917.

2 SHEETS—SHEET 1.

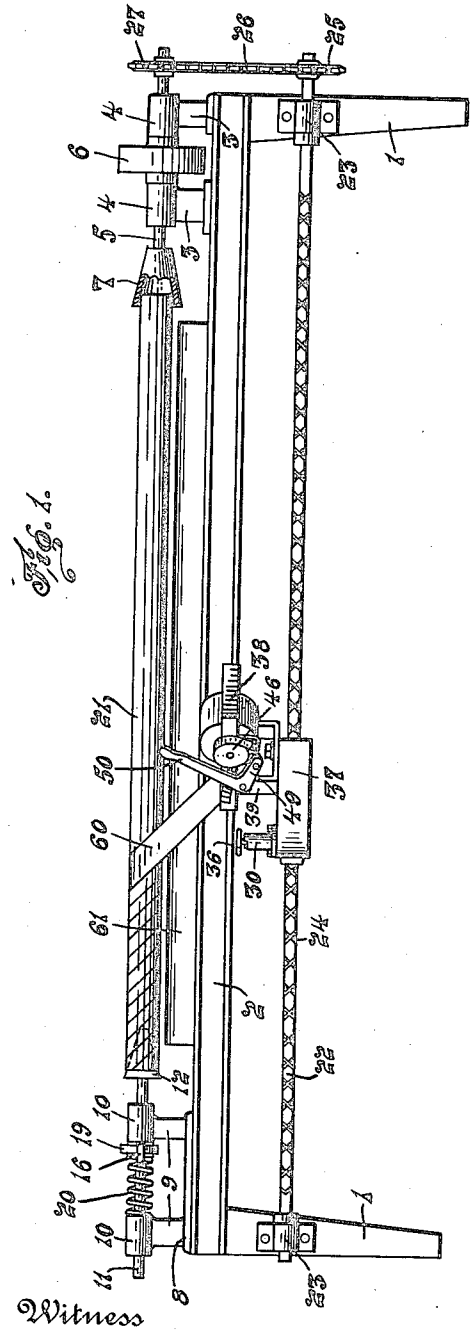


Fig. 1.

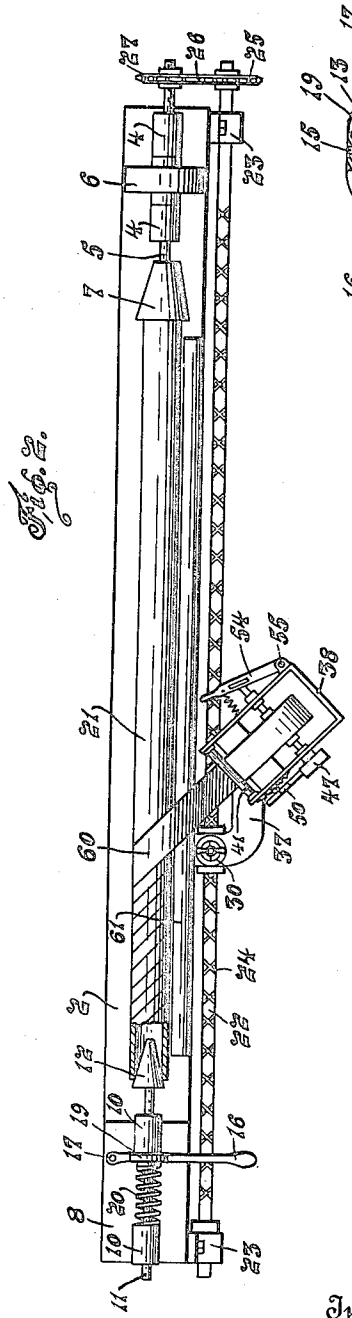


Fig. 2.

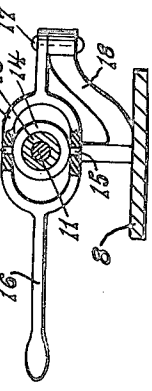


Fig. 7.

Witness

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2 SHEETS—SHEET 2.

Fig. 3.

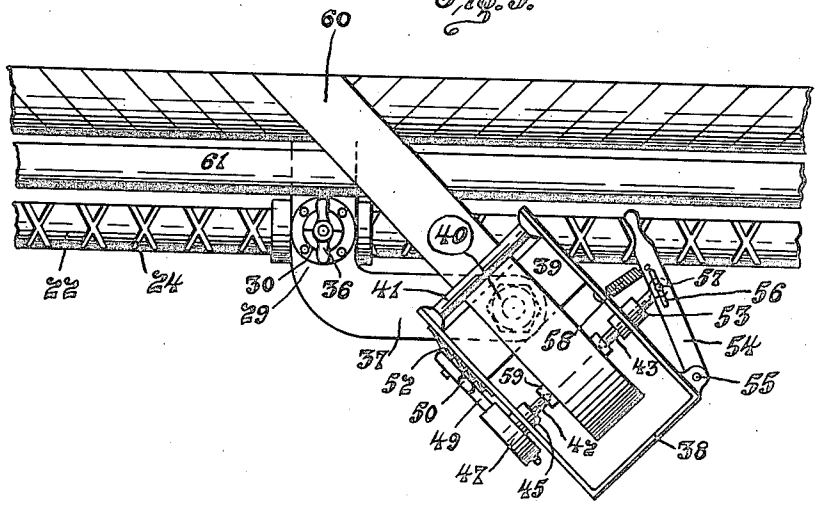


Fig. 4.

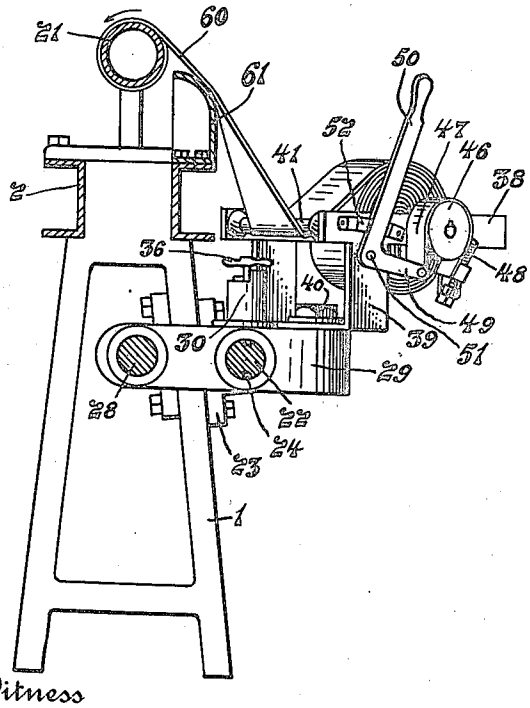
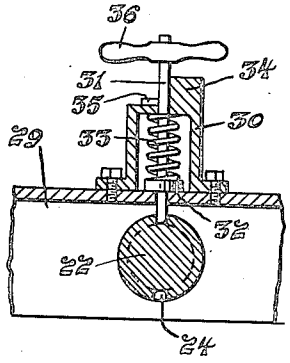


Fig. 5.



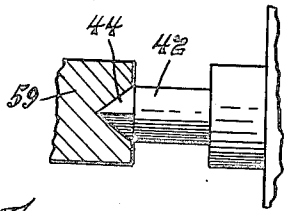


Fig. 6.

Witness

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UNITED STATES PATENT OFFICE.

ORA E. HECKMAN, OF AKRON, OHIO.

CROSS-WRAPPING MACHINE.

1,215,934. Specification of Letters Patent. Patented Feb. 13, 1917.

Application filed March 7, 1916. Serial No. 82,640.

To all whom it may concern:

Be it known that I, ORA E. HECKMAN, a citizen of the United States, residing at Akron, in the county of Summit and State of Ohio, have invented a new and useful Cross-Wrapping Machine, of which the following is a specification.

My invention relates to improvements in cross wrapping machines and has more especial reference to a machine of this character designed to cross wrap the inner tubes of pneumatic tires.

The object of the present invention is to provide a machine designed to cross wrap the inner tubes of pneumatic tires.

A further object is to provide simple and efficient means for moving the tape carrying spool back and forth, spirally wrapping and cross wrapping the convolutions of tape therefrom.

A further object is to provide means whereby a strip of tape is held taut during the time it is unwound from the spool and wound upon the tube.

A still further object is the provision of means for changing the position of the tape carrying spool as the movement of the carriage, upon which said spool is mounted, is reversed.

A still further object is the provision of means whereby the carriage may be moved backward or forward as desired with relation to the mandrel upon which the tube is carried, irrespective of the screw threaded shaft which operates the carriage.

A further object is the provision of a device which is adapted to wrap each convolution of the tape a half of a lap over the preceding convolution thus producing a smooth tube.

With these objects in view the invention consists in the novel construction and arrangement of parts, hereinafter described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size and minor details of construction may be made within the scope of the appended claims without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings:

Figure 1 is a side elevation of the cross wrapping machine constructed in accordance with my invention.

Fig. 2 is a top plan view of the same.

Fig. 3 is a fragmentary elevation on an enlarged scale of a portion of the mandrel and the carriage upon which the tape spool is carried.

Fig. 4 is a vertical transverse sectional view through the machine.

Fig. 5 is an enlarged sectional view showing the means for operatively connecting the carriage with the screw threaded shaft.

Fig. 6 is an enlarged detail view showing the means of connecting one of the spindles upon the carriage with the tape spool.

Fig. 7 is a detail sectional view of the means for slidably operating the shaft in the tail stock.

Similar numerals of reference indicate corresponding parts throughout the several figures of the drawings.

Referring more especially to the construction illustrated in the accompanying drawings the numerals 1—1 indicate end frames upon which the bed 2 of the machine is mounted, said bed being composed of the spaced channel irons as best illustrated in Fig. 4. At one extremity of the bed of the machine, a head stock is provided, said head stock comprising the brackets 3 upon which suitable bearings 4 are provided, a shaft 5 being journaled within said bearings and carrying a drive pulley 6. A conical cup 7 is provided upon the inner extremity of the shaft 5.

A tail stock 8 is provided in the opposite extremity of the bed and may be mounted for longitudinal adjustment upon said bed in any suitable and well known manner. Brackets 9 are formed upon the tail stock, each of said brackets being provided with a bearing 10 within which is rotatably and slidably mounted a shaft 11. A cone 12 is carried upon the inner extremity of the shaft 11. A fixed collar 13 is provided upon the shaft 11 intermediate the bearings 10 and said collar is provided with a groove within which is rotatably mounted a ring 14, said ring being provided with diametrically opposite pins 15. A lever 16 is pivotally connected at 17 to an arm 18 formed upon the tail stock 8, said lever being provided with a yoke portion 19 having suitable apertures which receive the pins 15. A spring 20

is interposed between the outer bearing 10 and the collar 13 tending to normally hold said collar against said inner bearing. A hollow mandrel 21, adapted to receive the tube to be cross wrapped, is placed in position upon the machine, the cone 12 entering one extremity of said hollow mandrel while the other extremity of said mandrel is located in the conical cup member 7, the spring 20 forcing the cone 12 firmly into the extremity of the mandrel thus holding the mandrel tightly between said cone and said cup member and causing the same to be rotated with the rotation of the shaft 5.

A screw threaded shaft 22 is journaled in suitable bearings 23 mounted upon the side frames 1, said shaft being preferably provided with the left and right screw threads 24 communicating at each extremity of the shaft and forming a diamond screw thread although the ordinary worm screw may be provided upon said shaft if desired. The sprocket wheel 25 is provided upon one extremity of the shaft 22 and is connected by means of a chain 26 to a sprocket wheel 27 mounted upon the shaft 5.

A rod 28 is carried between the end frames 1 and spaced from the screw threaded shaft 22. Slidably mounted upon the rod 28 is a carriage 29 preferably of channel shape. A cylindrical casing 30 is mounted upon the carriage 29, above the screw threaded shaft 22 and slidably mounted within said casing is a rod 31, the lower extremity of which is adapted to engage the screw threads 24 upon the shaft 22. A collar 32 is fixed upon the rod 31 and adapted to normally engage the upper wall of the carriage 29, a spring 33 being provided between said collar and the upper wall of the casing 30 for the purpose of normally holding the extremity of the rod 31 in engagement with the screw threads 24.

A projection 34 is provided upon the upper wall of the casing and the rod 31 is provided with a stud adapted to normally rest upon the top wall of the casing 30 as shown in Fig. 5, but when it is desired to move the rod out of engagement with the screw threads 24 in order to slide the carriage independently of the screw threaded shaft 22, the handle 36 upon the rod 31 is grasped and the rod is raised to a height bringing the stud 35 above the level of the projection 34 upon the casing, the rod then being given a half turn allowing the stud 35 to rest upon the projection 34 thus holding the extremity of the rod out of engagement with the screw threads upon the shaft 22.

The carriage 29 is provided with the arm 37 and pivotally mounted upon said arm is the frame 38 which carries the tape spool, said frame being provided with the yoke portion 39, which is pivotally connected to the arm 37 by means of a bolt 40 or the like. The frame 38 is of substantially U-shape, the roller 41 connecting the extremities of said frame. The tape spool is carried upon the spindles 42 and 43, said spindle 42 being provided with a pyramidal extremity 44. The spindle 42 is journaled in the bearing 45, said bearing being provided in one side of the frame 38 and a tension wheel 46 is provided upon the outer extremity of said spindle, a brake band 47 being connected at one extremity to the frame 38, an adjusting screw 48 being provided for adjusting the tension upon said brake band. The free extremity of the brake band is connected to the rock arm 49 which is formed upon the operating lever 50, said lever being pivoted at 51 to the frame and adapted to engage the ratchet segment 52 in order to place any desired amount of tension on the brake band.

The spindle 43 is slidably mounted within a bearing 53, said bearing being mounted upon the frame 38. A lever 54 is pivoted at 55 to the frame and is provided with an elongated slot 56, said slot receiving a stud 57 which is provided upon the slidable spindle 43, a spring 58 tending to normally urge the lever toward the frame 38 thus holding the spindle 43 in engagement with the tape spool. The spool 59 contains a roll of tape 60 of the ordinary form used for cross wrapping inner tubes. For the purpose of feeding the tape to the mandrel at the proper angle a curved tension board 61 is provided upon the bed of the machine in the path of the tape from the carriage to the mandrel.

In operating the device to cross wrap a tube the mandrel 21 is placed in position upon the cone 12 and within the cup 7 as shown in the drawings and the pulley 6 operated in any convenient and well known manner. The rod 31 upon the carriage will be placed in the position best shown in Fig. 5, bringing the extremity thereof into engagement with the screw threads 24 upon the shaft 22 and as said shaft is rotated the carriage will be moved parallel to the mandrel 21, automatically reversing its motion as it comes to each extremity of the mandrel, the frame within which the tape spool is carried automatically swinging upon its pivotal point as the direction of the carriage is reversed. The screw threads 24 upon the shaft 22 are of the proper pitch to cause the tape to make a half lap upon the tube with each revolution of the tube.

Although the drawings and above specification disclose the best mode in which I have contemplated embodying my invention I desire to be not limited to the details of such disclosure, for in the further practical application of my invention, many changes in form and construction may be made, as circumstances require or experience sug-

gests, without departing from the spirit of the invention, within the scope of the appended claims.

I claim:

1. In a machine of the character described, a frame, a mandrel rotatably supported upon said frame, a carriage slidably mounted upon said frame, a tape spool carrying frame pivotally mounted upon said carriage, a tape spool mounted within said tape spool carrying frame, a tension device connected to said tape spool, means for rotating said mandrel, a curved tension board located between said mandrel and said tape spool, the tape from said tape spool arranged to pass over said tension board, means for moving said carriage in a path parallel to said mandrel and means for reversing the direction of said carriage adjacent each extremity of said mandrel, said tape spool carrying frame arranged to be oscillated as the movement of the carriage is reversed.

2. In a machine of the character described, a frame, a mandrel rotatably mounted upon said frame, a carriage slidably mounted upon said frame, a tape spool carrying frame pivotally mounted upon said carriage, a tape spool mounted within said tape spool carrying frame, a tension device connected to said tape spool, means for rotating said mandrel, a tension roller located in the forward extremity of said tape spool carrying frame, a curved tension board provided upon the frame adjacent said mandrel, the tape from said tape spool arranged to pass over said tension board, means for moving said carriage in a path parallel to said mandrel, and means for reversing the direction of movement of said carriage adjacent each extremity of said mandrel, said tape spool carrying frame arranged to be oscillated as the movement of the carriage is reversed.

In testimony that I claim the above, I have hereunto subscribed my name.

ORA E. HECKMAN.