O. E. HECKMAN.

CROSS WRAPPING MACHINE.

APPLICATION FILED MAY 18, 1917.

1,252,109.

Patented Jan. 1, 1918.

2 SHEETS—SHEET 1.

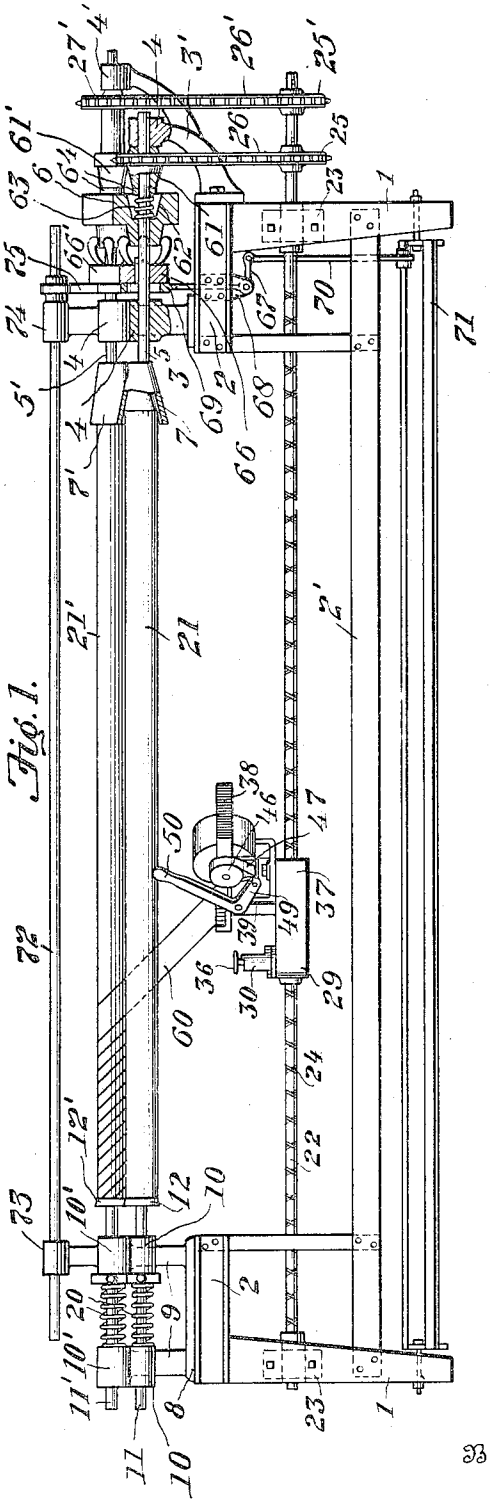


Fig. 1.

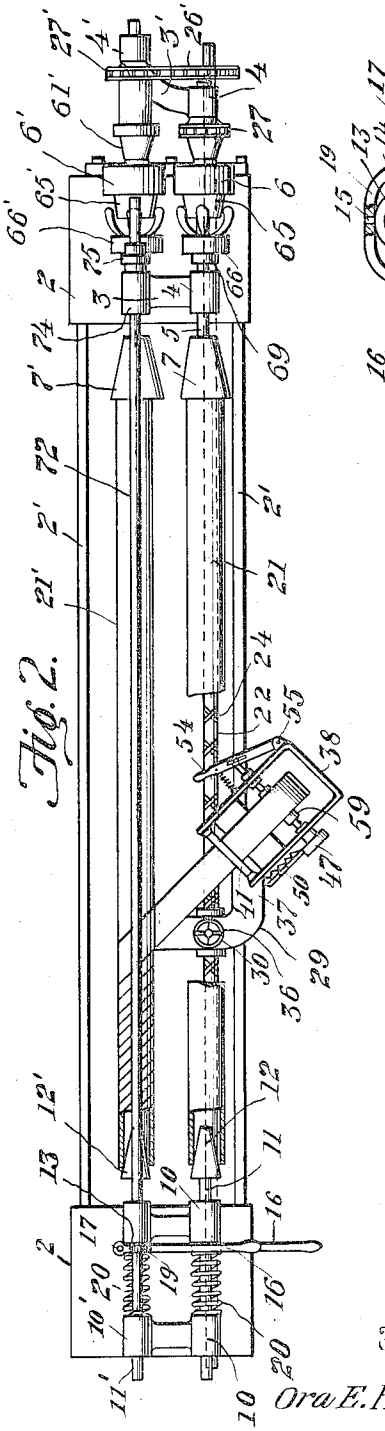


Fig. 2.

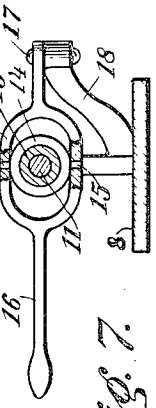


Fig. 7.

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2 SHEETS—SHEET 2.

Fig. 3.

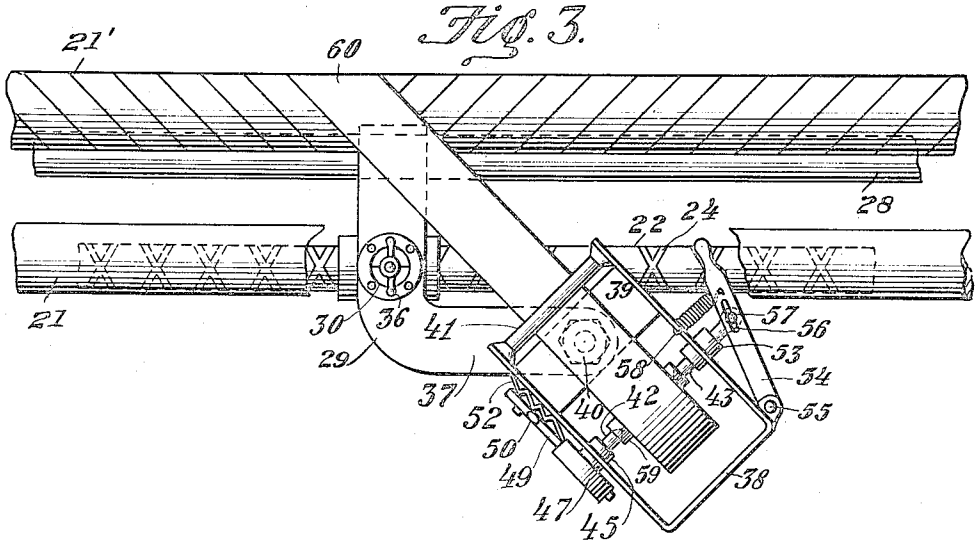


Fig. 4.

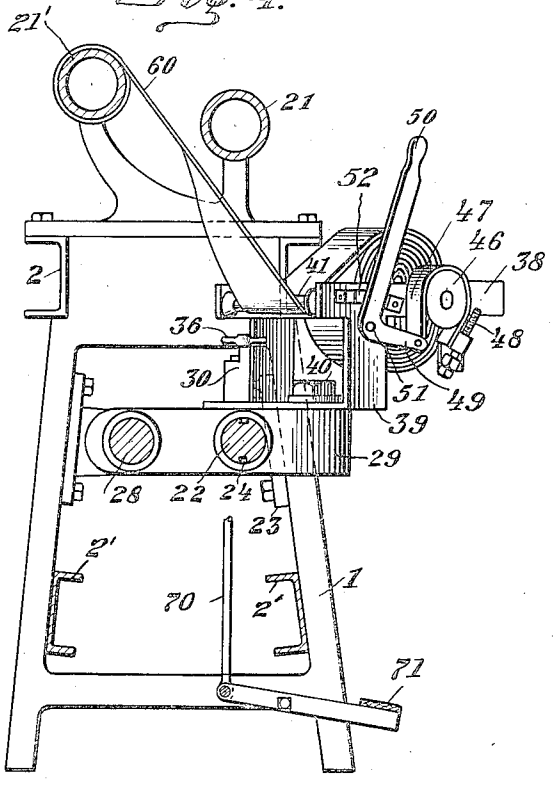


Fig. 5.

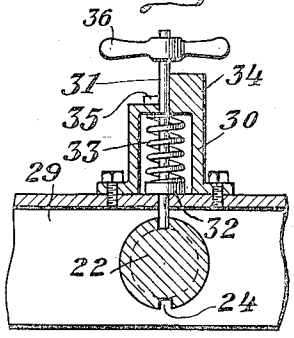
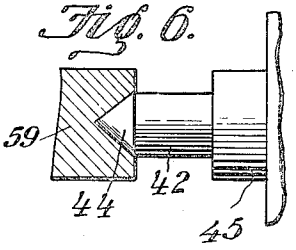


Fig. 6.



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UNITED STATES PATENT OFFICE.

ORA E. HECKMAN, OF AKRON, OHIO.

CROSS-WRAPPING MACHINE.

1,252,109. Specification of Letters Patent. Patented Jan. 1, 1918.

Application filed May 18, 1917. Serial No. 169,478.

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 a machine of this character having provision for two mandrels which may be alternately operated to cross wrap.

A further object is to provide simple and efficient means for operating one mandrel while the other mandrel is being removed from the machine or replaced therein.

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 accompanying drawing:

Figure 1 is a side elevation of my improved cross wrapping machine, parts being broken away for the purpose of illustration.

Fig. 2 is a top plan view of the same with parts broken away.

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

Fig. 4 is a vertical transverse section 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 one of the shafts 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 the standards upon which the tables 2 of the machine are mounted connecting frames 2′ being provided between said standards. At one extremity of the machine a head stock is provided, said head stock comprising the brackets 3 and 3′ upon each of which are provided a pair of bearings 4 and 4′, shafts 5 and 5′ respectively being journaled within said bearings, drive pulleys 6 and 6′ respectively being loosely mounted upon said shafts. Conical cups 7 and 7′ are provided upon the inner extremities of the shafts 5 and 5′ respectively.

A tail stock 8 is provided at the opposite extremity of the machine and is provided with brackets 9, each of said brackets being provided with a bearing 10 and a bearing 10′, shafts 11 and 11′ respectively being rotatably and slidably journaled within said bearings. Cones 12 and 12′ respectively are carried upon the inner extremities of the shafts 11 and 11′. Each of the shafts 11 and 11′ is provided with a fixed collar 13 intermediate the bearings within which the shaft is journaled, said collar being 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 and the collar 13 tending to normally hold said collar against the inner bearing.

Hollow mandrels, designated by 21 and 21′, adapted to receive the tubes to be cross wrapped are placed in position upon the machine, the cone 12 or 12′ entering one extremity of said hollow mandrel while the other extremity of the mandrel is located in the cup member 7 or 7′, the spring 20 forcing the cone firmly into the extremity of each mandrel, thus holding the mandrels tightly between the cones and cup members and causing the same to be rotated with the rotation of the shafts 5 and 5′.

A screw threaded shaft 22 is journaled in suitable bearings 23 mounted upon the stand-

ards 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. Sprocket wheels 25 and 25′ are provided upon one extremity of the shaft 22 and are connected by means of chains 26 and 26′ to the sprocket wheels 27 and 27′ loosely mounted upon the shafts 5 and 5′ respectively.

A rod 28 is carried between the standards 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 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 35 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.

The sprocket wheels 27 and 27′ are provided with the conical portions 61 and 61′ respectively, each of said conical portions being arranged to be received within a suitable conical socket formed in the adjacent drive pulley such as shown at 62 in the pulley 6, a spring 63 normally holding the pulley out of engagement with the cone. Collars 64 are provided upon the shafts 5 and 5′ to prevent longitudinal movement of the sprocket wheels upon said shafts. The pulleys 6 and 6′ are provided with conical portions 65 and 65′ arranged to be engaged by the clutch members 66 and 66′ respectively, said clutch members being slidably mounted upon the shafts 5 and 5′ respectively being keyed upon said shafts in order to prevent rotation of the clutch members with relation to the shafts.

For the purpose of operating the clutch member 66 in order to couple the drive pulley 6 and sprocket wheel 27 together upon the shaft 5, a bell crank 67 is pivotally mounted upon a suitable bracket 68 carried by the bed, said bell crank being provided at its upper extremity with a loop or ring 69 which encircles the shaft 5 and is arranged to contact with the clutch member 66. A link 70 connects the bell crank 67 with a treadle 71, which is pivoted between the standards 1—1 and which extends the entire length of the machine in order that the operator may be able to operate said treadle from any position in order to couple the drive pulley 6 and sprocket 27 to the shaft 5.

For the purpose of operating the clutch member 66′ in order to couple the drive pulley 6′ and sprocket 27′ to the shaft 5′ a rod 72 is slidably mounted in bearings 73 and 74 carried upon the brackets 9 and 3 respectively, said rod being provided with a downwardly depending arm 75 which engages the clutch member 66′. Thus by moving the rod 72 toward the right as shown in Fig. 1 the clutch member 66′ will be moved into engagement with the drive pulley 6′ which drive pulley will be moved into engagement with the sprocket 27′, thus coupling the

drive pulley and sprocket to the shaft 5'. As the rod 72 is moved in the opposite direction the spring within the drive pulley will naturally throw the several members out of engagement with each other, causing the sprocket and drive pulley to again run loosely upon the shaft.

In operating the device to cross wrap a tube one of the mandrels 21 or 21' is placed in position upon the proper cone and cup as shown in the drawings and caused to rotate as will be hereinafter described. For instance supposing that the mandrel 21' is first placed in position; the rod 72 is moved to operate the clutch member 61', thus coupling the drive pulley 6' and sprocket 27' to the shaft 5', causing the mandrel to be rotated through said shaft, and through the chain 26' and sprocket 25' rotating the shaft 22. The rod 31 upon the carriage will be placed in the position shown in Fig. 5 bringing the extremity thereof into engagement with the screw threads 24 upon said 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 at a proper pitch to make a half lap of the tape upon the tube with each revolution of the tube. While the mandrel 21' may be placed in position in the machine without interfering in any way with the mandrel 21' and as the mandrel 21' is completely wrapped it may be removed from the machine and the mandrel 21 operated by means of the treadle 71 being raised thus throwing the clutch member 66 into engagement with the drive pulley 6 coupling said drive pulley and the sprocket upon the shaft 5 causing said shaft and the mandrel 21 to be rotated and through the chain 26 and sprocket 25 rotating the shaft 22. It will be understood that the rod 72 must first be moved into the inoperative position uncoupling the drive pulley 6' and sprocket 27' before the treadle 71 is operated. While the mandrel 21 is being wrapped the mandrel 21' may be removed from the machine and replaced to receive another cross wrapping without interfering with the operation of the mandrel 21.

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 suggests 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 pair of mandrels rotatably mounted upon said frame, a shaft arranged to rotate each mandrel independently of the other mandrel, means for rotating each of said shafts independently of the other shaft, a carriage slidably mounted upon said frame, a tape spool carried by said carriage, a screw threaded shaft arranged to move said carriage in a path parallel to said mandrels, and means operatively connecting said screw threaded shaft to each of said first mentioned shafts.

2. In a machine of the character described, a frame, a pair of mandrels rotatably supported upon said frame, a shaft arranged to rotate each mandrel independently of the other, a sprocket wheel loosely mounted upon each shaft, a drive pulley loosely mounted upon each shaft, a clutch member slidably mounted upon each shaft, means for operating each clutch member independently of the other to fixedly engage the accompanying drive pulley and sprocket wheel upon the shaft, a carriage slidably mounted upon said frame, a tape spool mounted upon said carriage in a path parallel to said mandrels, a pair of sprocket wheels fixedly mounted upon said screw threaded shaft, and a chain connecting each of said last named sprocket wheels with one of said first mentioned sprocket wheels.

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

ORA E. HECKMAN.