P. E. WELTON.

TIRE WRAPPING MACHINE.

APPLICATION FILED APR. 5, 1915.

1,278,266.

Patented Sept. 10, 1918.

3 SHEETS—SHEET 1.

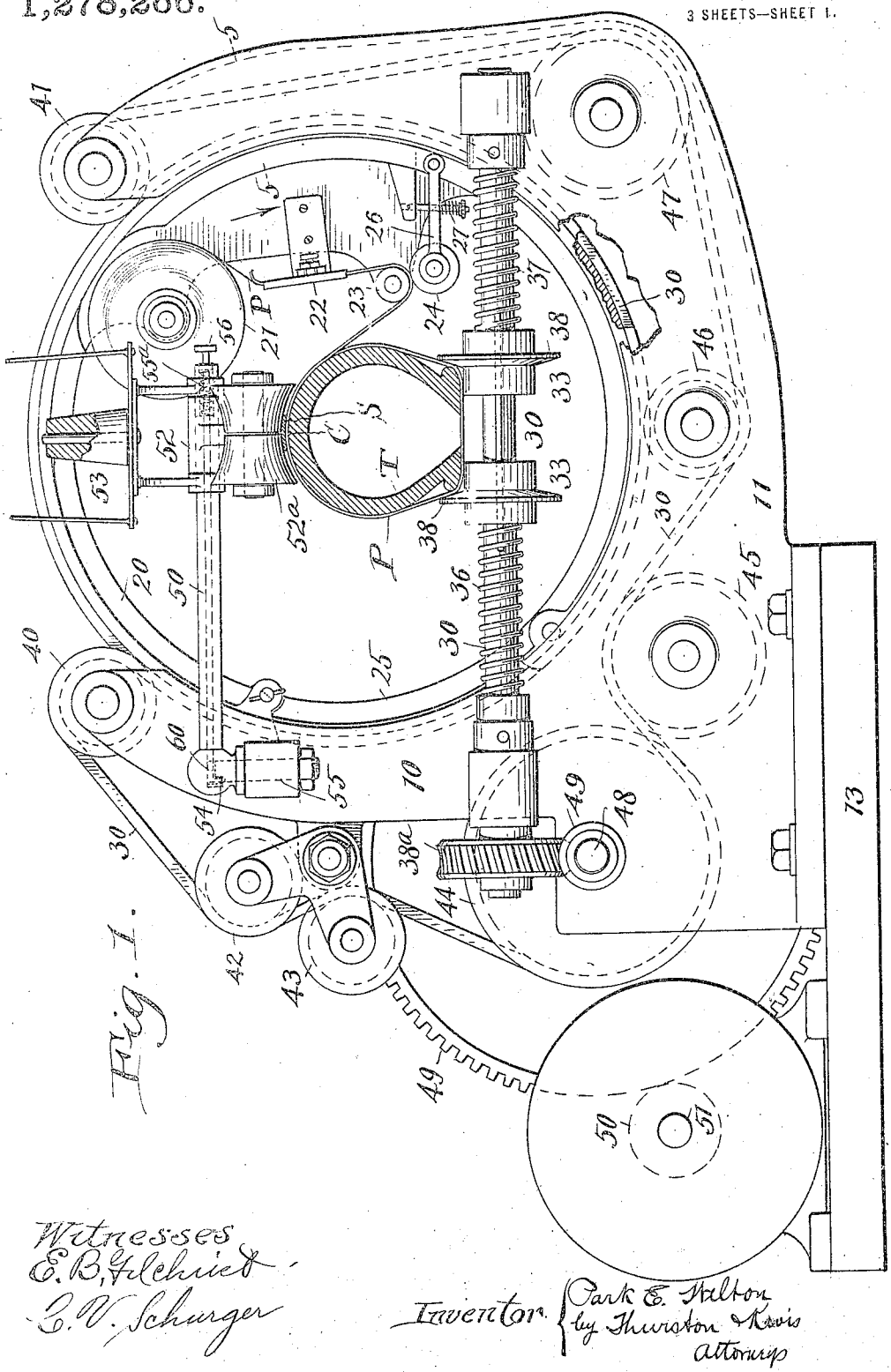


Fig. 1.

Witnesses
E. B. Filchiet
C. V. Schurger

Inventor
Clark E. Welton
by Thurston & Davis
Attorneys

P. E. WELTON.

TIRE WRAPPING MACHINE.

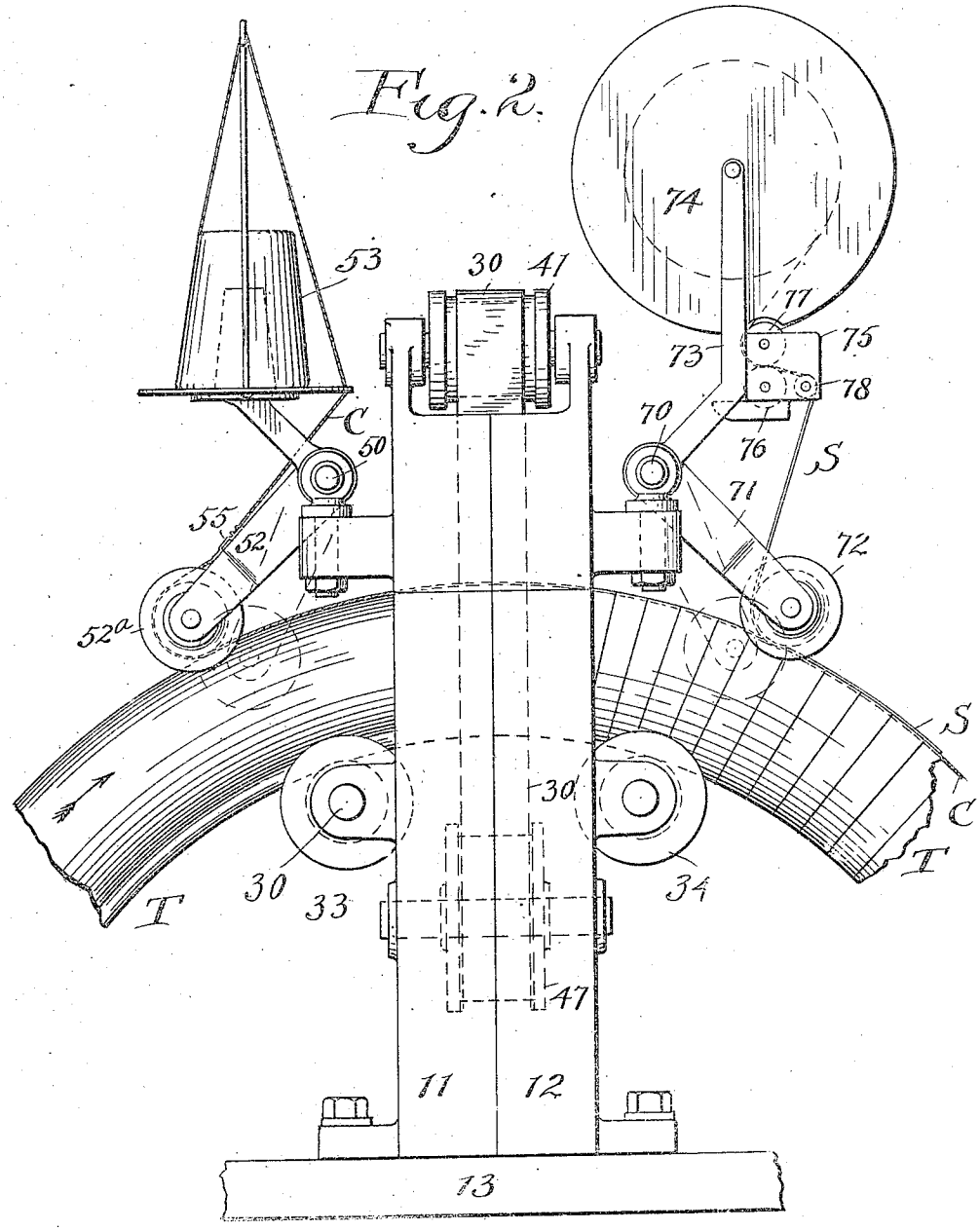
APPLICATION FILED APR. 5, 1915.

1,278,266.

Patented Sept. 10, 1918.

3 SHEETS—SHEET 2.

Fig. 2.



Witnesses.
E. B. Filchner
C. V. Schurger

Inventor
Park E. Welton
by Thurston & Lewis
Attorneys

P. E. WELTON.

TIRE WRAPPING MACHINE.

APPLICATION FILED APR. 5, 1915.

1,278,266.

Patented Sept. 10, 1918.

3 SHEETS—SHEET 3.

Fig. 5.

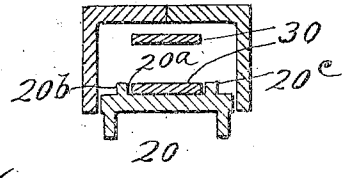
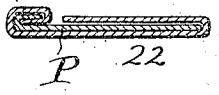


Fig. 6



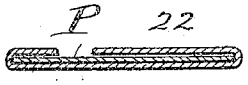
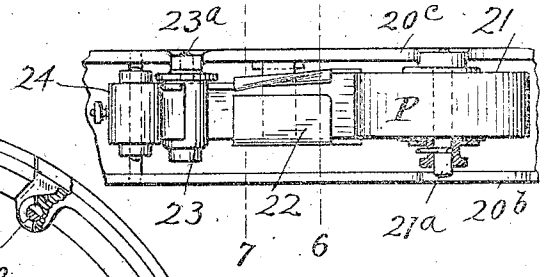


Fig. 7.

Fig. 4.



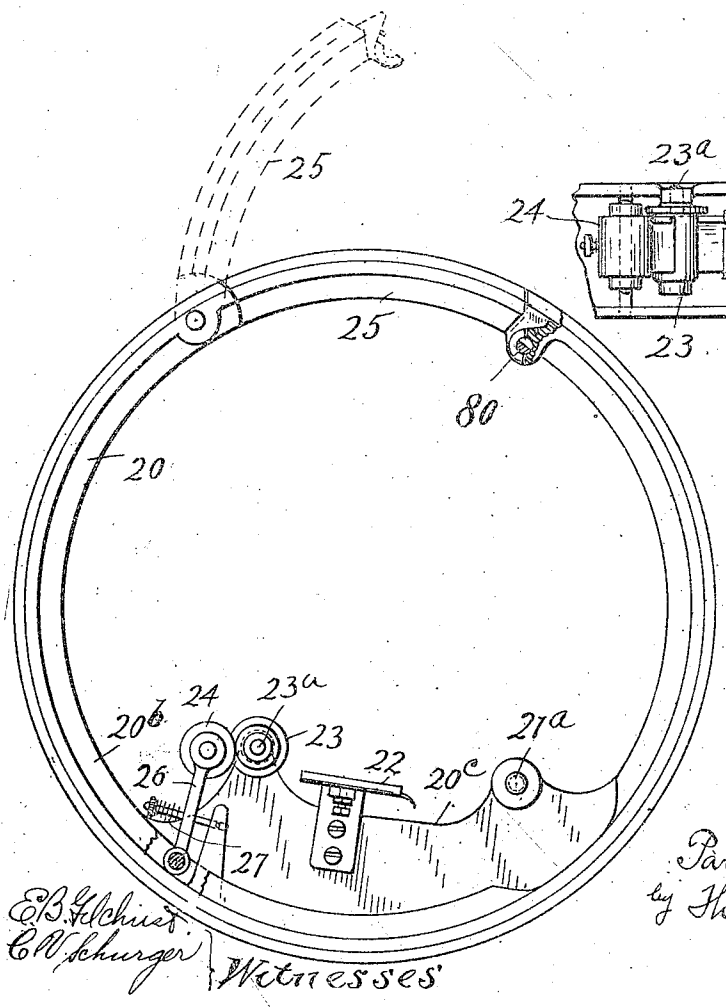


Fig. 3

Witnesses

E. B. Gilchrist

C. W. Schurger

Inventor

Park E. Welton

by Thurston & Lewis

attorneys

UNITED STATES PATENT OFFICE.

PARK E. WELTON, OF CUYAHOGA FALLS, OHIO, ASSIGNOR TO BIRMINGHAM IRON FOUNDRY, OF DERBY, CONNECTICUT.

TIRE-WRAPPING MACHINE.

1,278,266. Specification of Letters Patent. Patented Sept. 10, 1918.

Application filed April 5, 1915. Serial No. 19,137.

To all whom it may concern:

Be it known that I, PARK E. WELTON, a citizen of the United States, residing at Cuyahoga Falls, in the county of Summit and State of Ohio, have invented a certain new and useful Improvement in Tire-Wrapping Machines, of which the following is a full, clear, and exact description.

This invention relates to improvements in the kind of machines organized to spirally wrap a narrow strip of paper or fabric around an annulus, such, for example, as a pneumatic tire casing.

One object of the invention is to produce a cheaper machine for this purpose than has heretofore been known, and one which will run with less noise, and with great speed.

Another object of the invention is to so construct such a machine that a cord will be laid thereby between the wrapping and the annulus, extending circumferentially around the latter,—the purpose of the cord being to rip the wrapping so that it may be easily removed from the annulus.

Another object is to so organize a machine of this sort that it will paste onto the spiral wrappings a paper strip which extends circumferentially around the annulus,—the purpose of said strip being to protect the wrapping from injury.

And finally, the object is to so organize such a machine that the unwrapped annulus may be quickly put into the machine and the wrapped annulus quickly taken therefrom.

The invention consists in the construction and combination of parts by which these ends are attained substantially as shown in the drawings, and hereinafter described and definitely pointed out in the appended claims.

In the drawings, Figure 1 is a front elevation of a machine embodying the invention and a sectional view of a tire casing while supported in the machine and while being wrapped; Fig. 2 is a view from the right side of Fig. 1; Fig. 3 is a detached view of the rotary shuttle which forms a part of the machine; Fig. 4 is a view looking down upon that part of the shuttle which forms the bottom of Fig. 3; Fig. 5 is a sectional view on line 5—5 of Fig. 1; and Figs. 6 and 7 are respectively sectional views of the edge folder which is carried by the shuttle.

Referring to the parts by letters, 10 represents an open topped circular housing, that is to say, a U-shaped housing whose inner periphery is substantially in the form of a circular arc. This housing is made up of a front plate 11 and a rear plate 12, which are fixed to the bed plate 13, in parallel relation and at a suitable distance apart. Two guide rollers 40 and 41 are respectively mounted in the upper ends of the two arms of this housing between the front and rear plates thereof.

An endless belt 30 which passes over these rollers extends down into the housing in the form of a loop and in this loop the annular shuttle 20 is hung. This belt after it leaves the shuttle passes over the roller 40, thence between two tension rolls 42, 43, under a driving roll 44 over a guide roll 45, and under two guide rolls 46 and 47, then up to and over roll 41, and down into the housing to form the shuttle supporting loop. The driving roll 44 is fixed to a driven shaft 48 which carries a gear 49 adapted to be engaged by a pinion 50 fixed to the main driving shaft 51 of the machine.

In the periphery of the annular shuttle there is a circumferential groove 20^a between the two flanges 20^b, 20^c. This shuttle is of such diameter that when hung in the loop of the belt as stated, its edges project between and therefore overlap the edges of the front and rear plates of the housing, substantially as shown, which insures that the shuttle shall have no substantial movement in the direction of its axis of rotation. It is to be noted that the two belt rolls 40 and 41 are located above the axis of rotation of the shuttle and overhang the shuttle to an extent such as to substantially prevent any upward movement thereof.

The annular shuttle 20 is formed in part of an arc shaped gate 25 which is adapted to fill an opening cut in the shuttle proper, and thereby complete the annulus. When the shuttle has been turned so that this gate is at its top, the gate may be swung open, and therefore the tire casing T which is to be wrapped, may be passed down through the opening in the top of the housing, and into this shuttle to the position it must occupy while being wrapped. This gate 25 is preferably hinged at one end to the shuttle, and when closed is to be latched closed, or, otherwise, centrifugal force might open it when the shuttle is rotating. Any suitable latch

may be employed, but the latch 80 shown is a little rotatable shaft which between its ends is half cut away. The end of the gate has a semi-circular recess. This latch may be turned so as to project into this recess, and therefore latch the gate, or not to project into it at all, and thereby allow the gate to be opened.

This shuttle has opposite the gate an inwardly directed flange 20^e on which certain parts now to be described are supported. A reel 21 is rotatably mounted on an arbor 21^a fixed to this flange, which arbor is parallel with the axis about which the shuttle turns. On this reel a long narrow strip of paper or fabric P may be wound. From this reel the paper passes through an edge-folder 22 which is fixed to said flange and by which one edge of the strip P is turned over. This edge-folder is, *per se*, of familiar form, and therefore need not be further explained. The paper with its edge turned over by this folder passes between two rolls 23, 24, and thence to the annulus T on which it is to be wound. The roll 23 may be mounted on a fixed stud 23^a, but the roll 24 is preferably mounted in the forked end of a swinging arm 26 which is pivoted to the flange 20^e, and is under the influence of a spring 27 acting to move the swinging roll 24 against the paper which is passing between rolls 24 and 23. This spring actuated roll 24 in cooperation with the roll 23 acts as a tension device, and also flattens down the turned over edge of the paper strip.

The annulus T to be wrapped is supported while being wrapped, and is slowly turned in order that the wrapping may be laid spirally, by two pairs of flanged rollers 33, 34, viz., one pair carried by a shaft 30, which extends horizontally in front of the housing, and the other of which extends horizontally behind the housing, both shafts being below the axis about which the shuttle turns. The two rollers 33, 33, on the front shaf 30 have a driving connection with said shaft; but the two rollers 34, 34, on the rear shaft may be loosely rotatable thereon. Two springs 36, 37, act on the sleeves of each pair to move them toward one another. The tire casing rests on the cylindrical parts of said sleeves, and the flanges 38 of such sleeves engage the sides of the tire casing and act to press the two edges thereof together. As the paper strip is carried around the tire casing by the shuttle, the shaft 30 is slowly turned and thereby the tire casing will be caused to advance slowly from front to rear. Since the shuttle is rotating at the same time, the paper strip will be wrapped spirally about the tire casing between the two pairs of flanged rolls, and therefore upon that part of the tire casing whose edges are being pressed together. When, therefore, the wrapped tire casing passes rearward, and off of the rear pair of rolls, it will expand slightly, and thereby the wrapping will be substantially tightened. The shaft 30 may be provided with a worm wheel 38^a which engages a worm 49^a on shaft 48, and thereby the shaft 30 may be driven at the desired rate of speed relative to that of the shuttle.

If one wished merely to wrap a paper or frabic strip around an annulus, the machine, as heretofore described, will effect this result; but as stated, it is also desirable to lay a ripping cord circumferentially upon the tire casing beneath the paper wrapping; and it is also desirable to paste a protecting strip of paper circumferentially around the tire and on the outer surface of the spiral wrapping thereon. In order to so lay the cord C an arm 50 is pivoted on a vertical axis 55 to the housing above the tire casing; and when in working position this arm extends from its pivotal point horizontally beyond the center of rotation of the shuttle. A forked arm 52 is pivotally mounted upon this rod and it extends forward and downward therefrom. In its outer end a concave roll 52^a is rotatably mounted. A cord spool 53 is also supported on the rod 50 and guide eye 55^b is also carried on this arm. The cord goes from this spool, through the guide eye, and thence downward under this roll on the front side thereof, the end of this cord being in some suitable way connected with the tire casing.

The weight of the roll and the arm in which it is mounted may be sufficiently great to hold the roll down upon the surface of the unwrapped tire casing. Therefore, as the tire casing is turned, the cord will be laid on that part of its surface which is close to and approaching the point at which spiral paper wrapping will be applied thereto.

A latch 60, which is shown in dotted lines in Fig. 1, may be carried by this rod, and thereby the rod may be held in the operative position described. This latch is simply a bar passing lengthwise through the rod 50 and having a finger in its end adapted to enter a notch 54 in the pivot pin 55 on which the arm is mounted. It may be under the influence of a spring 54^a tending to draw this finger into this notch; and it may be provided with a projecting knob 56 by which the operator may press the latch in the contrary direction and so unlatch the arm and permit it to be swung out of the way of a tire casing which is being put into or taken from the machine.

Another similar horizontal rod 70 is pivoted to the rear side of the housing and extends horizontally from one side of the housing toward another. A forked arm 71 is pivotally hung upon it, and a roller 72 is mounted thereon in such position that it

may rest upon and be turned by the wrapped part of the tire casing. There is also fixed to this arm the upstanding standard 73 in which a reel 74 is mounted on which is wound a strip S of paper tape which is gummed on its inner surface. To this standard is fixed a cup or well 75 in which water may be placed. Likewise these standards carry bearings in which three guide rolls 76, 77, 78, may be mounted, the guide roll 76 being so mounted that it projects down into the water in said cup. When a wrapped part of the tire casing as it turns rearward comes under this roller, the tape S whose gummed side has been moistened by contact with the roll 76 as it passes between said roll and roll 77, passes over roll 78, and thence under roll 72 by which it is pressed down upon and thereby caused to adhere to the paper wrapping on the tire casing. Thereafter, as the tire casing continues to rotate, this gummed and moistened paper strip will be applied to the wrappings of the tire casing and pressed down onto the same with sufficient force by means of the roller which, together with its supporting arm, may be sufficiently heavy to effect this result.

Having described my invention, I claim:

1. In a machine for wrapping annular tire casings and the like, the combination of an incomplete annular housing, an annular shuttle having an opening for the passage of a tire casing therethrough, means for rotatably supporting the shuttle within the housing, means for supporting within said shuttle the tire casing to be wrapped, means for turning said shuttle and tire casing at predetermined relative rates, a roll of wrapping material rotatably mounted on the shuttle, an edge turner fixed to the shuttle adjacent to said roll of wrapping material, a bar pivoted on a vertical pivot to the front side of one of the side members of the housing and extending therefrom horizontally toward the other side member of the housing, means for locking said bar in operative position, an arm pivotally mounted on said bar and extending forward therefrom, a concave roller rotatably mounted in the end of said arm, a cord spool support fixed to said bar and located above the same, and a guide eye for the cord.

2. In a machine for wrapping annular tire casings and the like, the combination of an incomplete annular housing, an annular shuttle having an opening for the passage of a tire casing therethrough, means for rotatably supporting the shuttle within the housing, means for supporting within said shuttle the tire casing to be wrapped, means for turning said shuttle and tire casing at predetermined relative rates, a roll of wrapping material rotatably mounted on the shuttle, a support located behind the housing and above the center of the shuttle, a roll of gummed tape mounted on said arm, an arm pivotally connected with said support and extending rearward therefrom, a roll rotatably mounted in the end of said arm, guide rolls with which the gummed tape engages in passing to the last named roll, and means for moistening the gummed surface of said tape.

3. In a machine for wrapping annular tire casings and the like, the combination of an incomplete annular housing, an annular shuttle having an opening for the passage of a tire casing therethrough, means for rotatably supporting the shuttle within the housing, means for supporting within said shuttle the tire casing to be wrapped, means for turning said shuttle and tire casing at predetermined relative rates, a roll of wrapping material rotatably mounted on the shuttle, a bar connected by a vertical pivot to the rear face of one side member of the housing and extending horizontally therefrom toward the other of said side members above the center of the shuttle, an arm pivoted on said bar, a roller rotatably mounted in the end of said arm, a support for a roll of gummed paper, guide rollers over which said gummed paper strip passes, and a cup for containing water in which one of said rollers projects.

4. In a machine for wrapping annular tire casings and the like, the combination of an open top housing having front and rear plates, a plurality of belt guiding rolls mounted on said housing between the front and rear plates thereof, two of said rollers being at the top of the housing and adjacent to the opening therethrough, an endless belt which engages said rolls and is extended in the form of a loop down between the said two upper rolls and into the housing, a shuttle having in its periphery an annular groove which shuttle is supported in said loop and is of such diameter that it projects between the front and rear plates of the housing, means for supporting within said shuttle the tire to be wrapped, means for turning said shuttle and tire at predetermined relative rates, and a roll of wrapping material rotatably mounted upon said shuttle.

In testimony whereof, I hereunto affix my signature in the presence of two witnesses.

PARK E. WELTON.

Witnesses:
E. L. THURSTON,
A. J. HUDSON.