E. H. ANGIER AND W. M. WHEILDON.

WRAPPING MACHINE.

APPLICATION FILED MAY 19, 1917.

1,382,403.

Patented June 21, 1921.

5 SHEETS—SHEET 1.

Fig. 1.

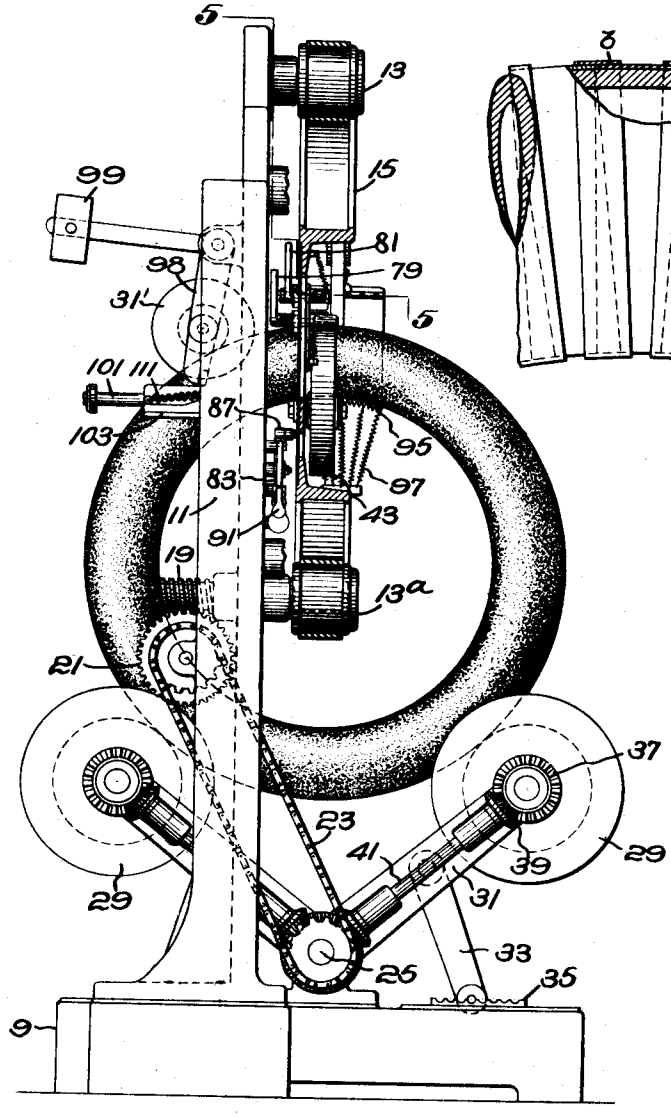
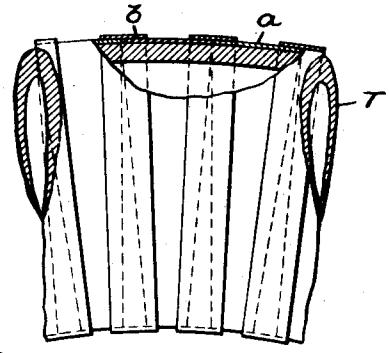


Fig. 8.



Inventors:
Edward H. Angier,
William M. Wheildon,
by Emery Booth Janney & Varney.
Attys.

E. H. ANGIER AND W. M. WHEILDON.

WRAPPING MACHINE.

APPLICATION FILED MAY 19, 1917.

1,382,403.

Patented June 21, 1921.

5 SHEETS—SHEET 2.

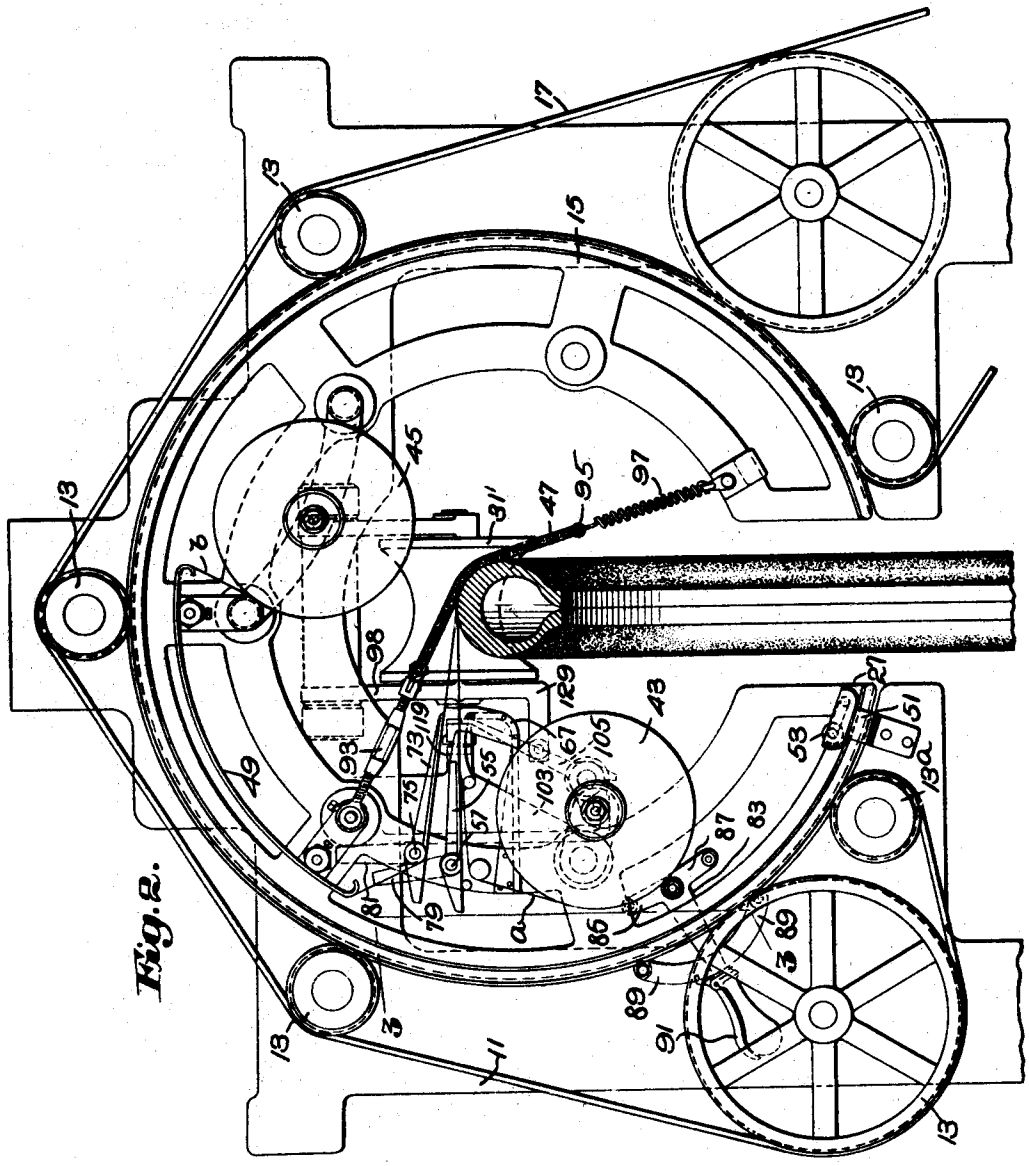


Fig. 2.

Inventors:
Edward H. Angier.
William M. Wheildon.
by Emery Booth Janney & Varney
Attys.

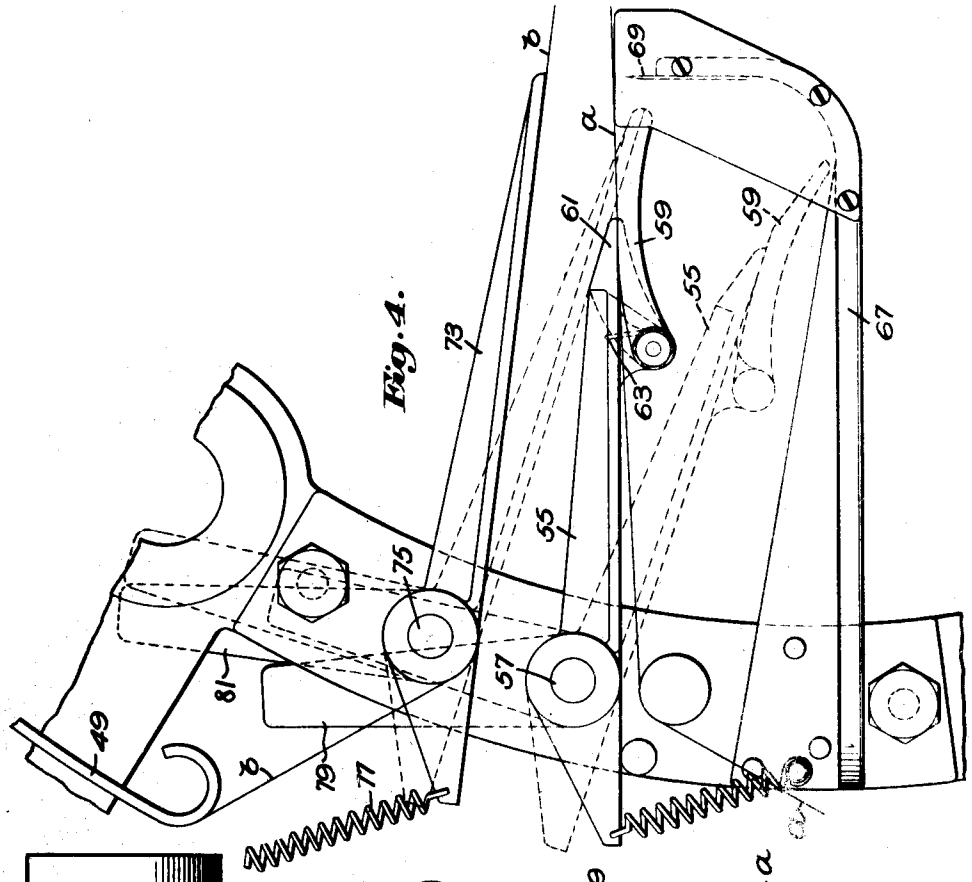
E. H. ANGIER AND W. M. WHEILDON.

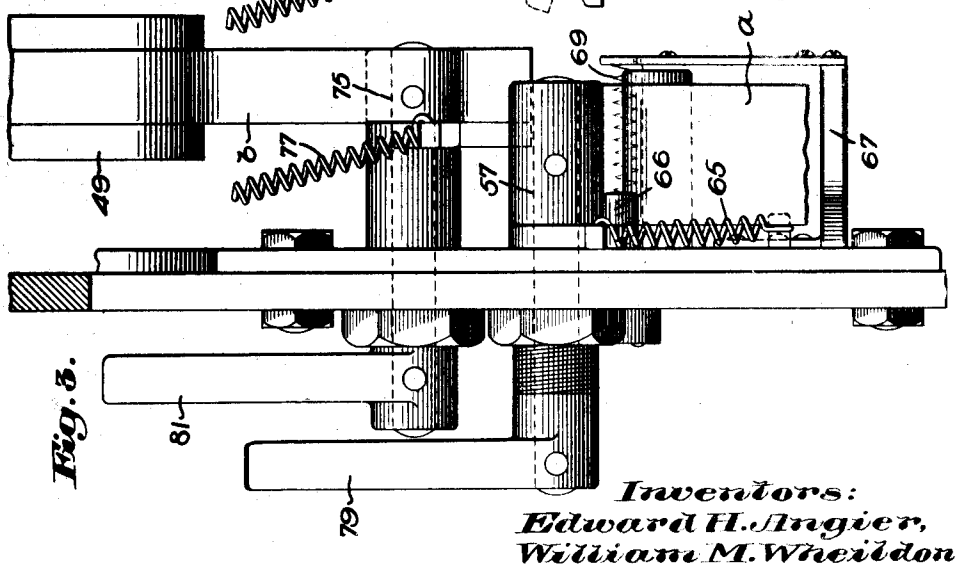
WRAPPING MACHINE.

APPLICATION FILED MAY 19, 1917.

1,382,403. **Patented June 21, 1921.**

5 SHEETS—SHEET 3.





Inventors:
Edward H. Angier,
William M. Wheildon
by Emery Booth Janney & Varney
Attys.

E. H. ANGIER AND W. M. WHEILDON.

WRAPPING MACHINE.

APPLICATION FILED MAY 19, 1917.

1,382,403. **Patented June 21, 1921.**

5 SHEETS—SHEET 4.

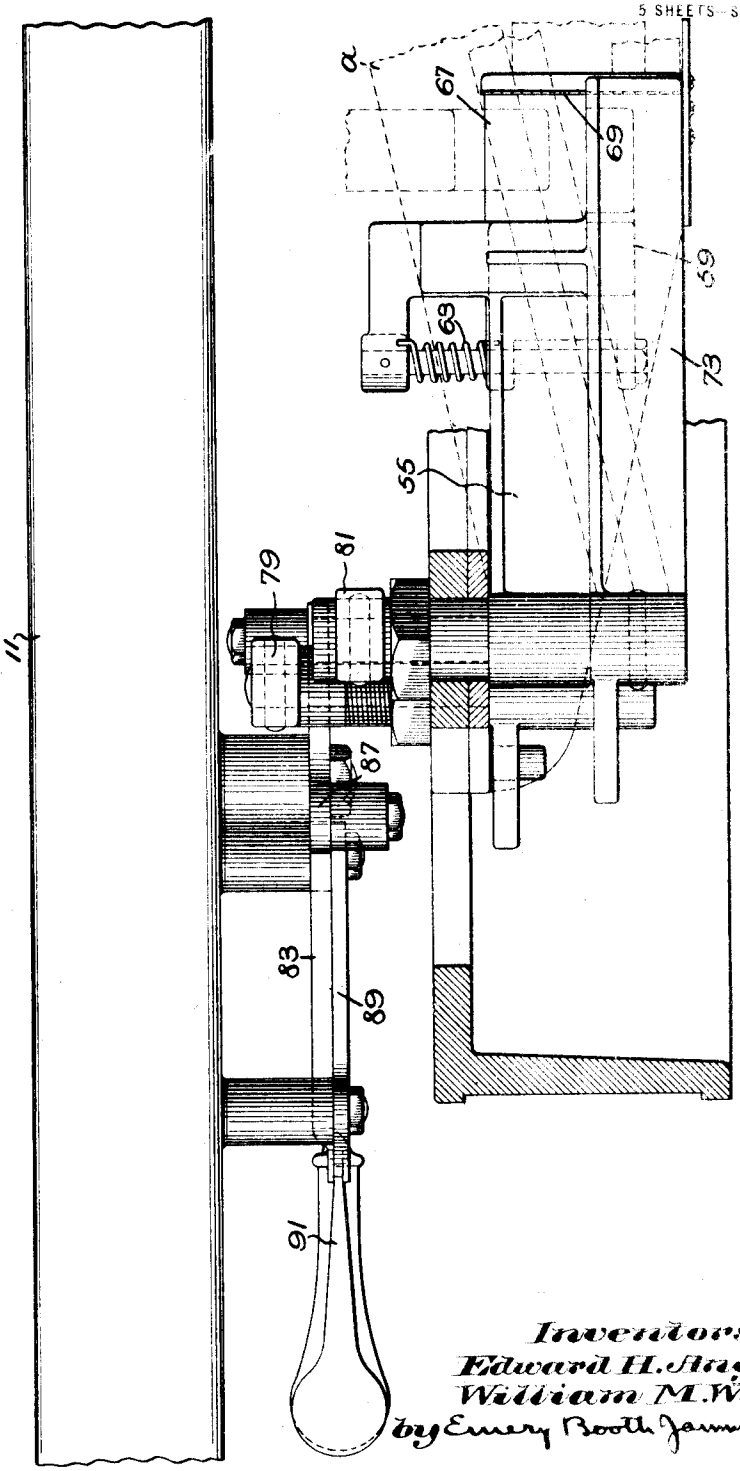


Fig. 5.

Inventors:
Edward H. Angier,
William M. Wheildon
by Emery Booth Jamy & Varney
Attys.

E. H. ANGIER AND W. M. WHEILDON.

WRAPPING MACHINE.

APPLICATION FILED MAY 19, 1917.

1,382,403. **Patented June 21, 1921.**

5 SHEETS—SHEET 5.

Fig. 2.

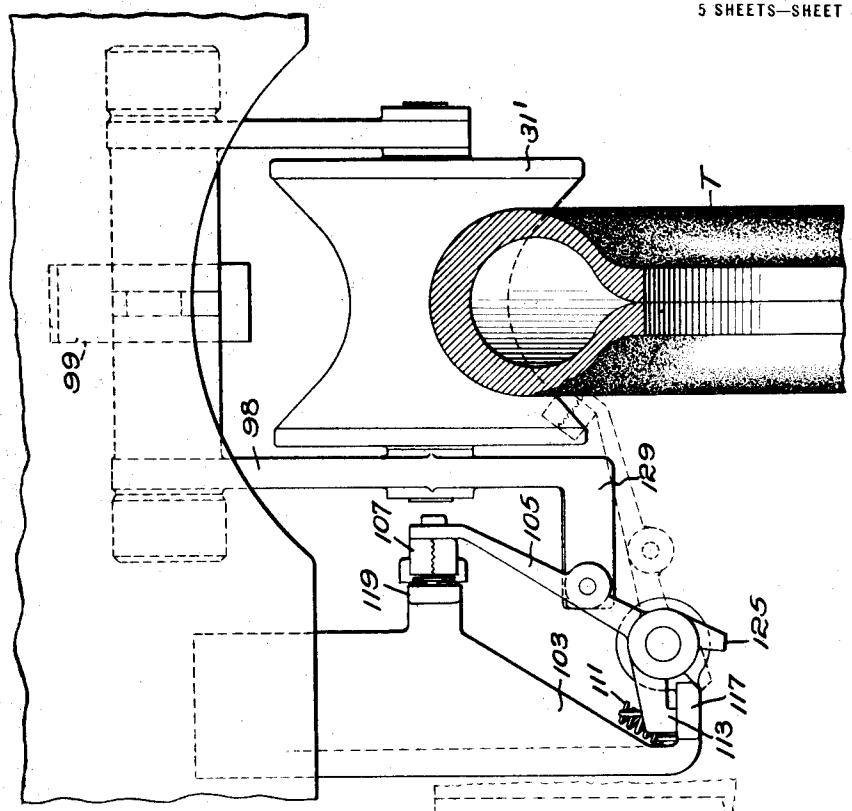
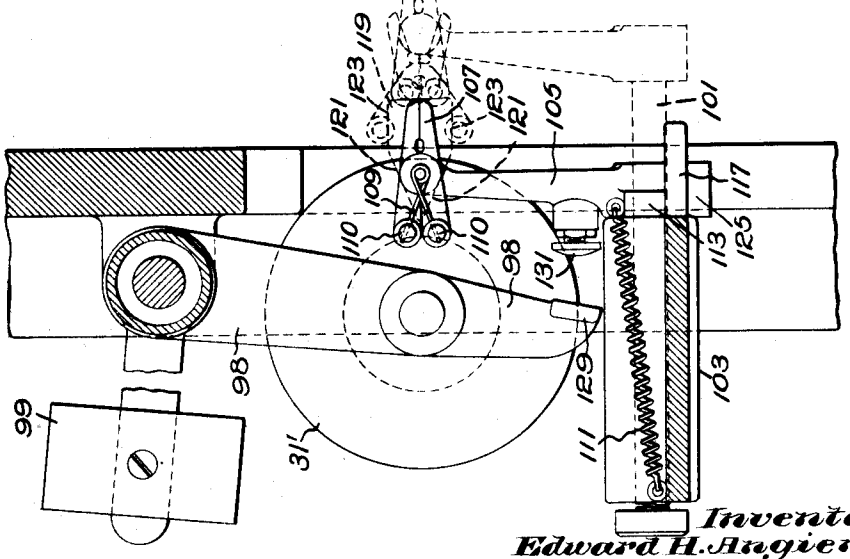


Fig. 6.



Inventors:
Edward H. Angier.
William M. Wheildon,
by Emery Booth Jamieson Varney, Attys.

UNITED STATES PATENT OFFICE.

EDWARD H. ANGIER, OF FRAMINGHAM, AND WILLIAM M. WHEILDON, OF ASHLAND, MASSACHUSETTS; SAID WHEILDON ASSIGNOR TO SAID ANGIER.

WRAPPING-MACHINE.

1,382,403. Specification of Letters Patent. Patented June 21, 1921.

Application filed May 19, 1917. Serial No. 169,773.

To all whom it may concern:

Be it known that we, EDWARD H. ANGIER and WILLIAM M. WHEILDON, citizens of the United States, and residents of Framingham and Ashland, respectively, in the county of Middlesex and State of Massachusetts, have invented an Improvement in Wrapping-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to wrapping machines and in particular to machines used to apply a wrapping or service of paper strip. By service we mean a helically applied wrapping similar in application to the "service," or perhaps more closely similar to the "parceling," put on standing rigging and other ropes at sea. Examples of such machines are those used to wrap or serve annular or toric articles such as vehicle tires. The purpose of our present invention is to improve this kind of machine and in particular to make its action more nearly automatic and less dependent upon an operator.

For convenience in description we shall refer to a machine for wrapping a tire and shall call the article operated upon a tire, using that word in an exemplary sense.

In the accompanying drawings we have disclosed our improvements as applied to a machine of well known type, embodying supporting means for the tire and strip-serving means comprising an annular, rotary, paper-carrying shuttle. In particular the machine disclosed embodies improvements shown in our prior application Serial No. 153,992, filed March 10, 1917.

In the accompanying drawings—

Figure 1 is a side elevation of a machine embodying my invention, parts being broken away.

Fig. 2 is a front elevation of the upper portion of the machine.

Fig. 3 is a vertical section on line 3—3 of Fig 2.

Fig. 4 is a front elevation of the parts appearing in Fig. 3.

Fig. 5 is a section on line 5—5 of Fig. 1.

Fig. 6 is a detailed side elevation of the strip end applying mechanism.

Fig. 7 is a front elevation thereof, and

Fig. 8 is a view of a portion of a tire inclosed in one form of wrapping which the machine illustrated is adapted to apply.

Referring particularly to Figs. 1 and 2 of the drawings, the machine there illustrated comprises a base 9 from which rises a standard or frame 11, carrying a centric group of rolls 13 adapted to suspend between them the annular shuttle 15. A belt 17 extends around a large portion of the circumference of the shuttle and also is trained around the rolls 13, this belt serving to drive the shuttle from a suitable motor (not shown). In the present embodiment of the invention one of the rolls 13^a has a shaft provided with a worm 19 which engages a worm-wheel 21 which may drive by means of a chain 23 a shaft 25 hereafter to be referred to. By referring to Fig. 2 it will be seen that the belt engages the roll 13^a throughout a wide arc of its circumference and thus an effective and positive drive for the shaft is provided for.

As seen in Fig. 2, the shuttle 15 is cut away at one point, indicated at 27, to permit the tire T to be placed in the machine. The tire may be supported by lower rolls 29 and an upper roll 31′. To adapt the machine for use with tires of different sizes the rolls 29 are mounted on swinging arms 31′ which may be adjusted by means of prop links 33 which engage racks 35 on the base 9 of the machine. It will be clearly understood by reference to Fig. 1 that the two rolls 29 can be so adjusted that the circumference defined by their surfaces and the surface of the roll 31′ can be varied as desired within quite wide limits.

The rolls 29 may be utilized for feeding the tire. We have here shown them as provided with miter gears 37 engaging with gears 39 on shafts 41 carried by links 31 and driven by miter gearing from the shaft 25.

In machines of this general type a supply of paper is mounted on the shuttle 15 and the tire is revolved while the shuttle is rotated, thus causing the paper strip supply to move relatively to the tire in a helical path, thus permitting the strip to be drawn off to the tire and wrapped thereabout as a service.

Referring now more particularly to Fig. 2, we shall describe in somewhat greater detail the construction of the particular form of strip-serving mechanism herein disclosed. As already stated, the machine is of the type shown in our prior application Serial No. 153,992, which may be used to inclose the tire in a wrapping composed of two strips breaking joint (as seen in Fig. 8), one strip *b* being a sealing strip preferably adhesively secured to the opposed edges of adjacent convolutions of the first strip *a*. Our present improvements, however, are by no means limited to a machine of this type. We have herein (Fig. 2) shown a roll 43 adapted to carry the main wrapping strip *a* and a roll 45 adapted to carry the sealing strip *b*, the two strips being led over suitable guides (of a form hereinafter to be described) to the tire, against which they are pressed by means of a wiper 47, preferably of a particular form which we will describe more fully hereafter. One of the strips, such as the sealing strip *b*, may be led over an arcuate supporting surface 49 which supports a length of the paper for coöperation with a strip treating device 51, conveniently comprising a suitable adhesive applying roll 53 running in a reservoir. It will be understood from an inspection of Fig. 2 that upon each rotation of the shuttle the roll 53 will wipe over the length of paper supported by the surface 49. The length of this surface is made such that it will support sufficient paper to make a complete turn of the service about the tire and thus the strip *b* may be moistened or have adhesive applied thereto so as to permit the turns of paper on the tire to be secured together to form a tight inclosing covering therefor.

The mechanism so far described in general terms is for the most part similar to that disclosed and described in our previous application referred to. The matters now about to be explained are features of novelty. It will be understood that many of these features bear coöperative relationship to the parts already described.

In a machine of this type as long as the shuttle is rotated paper will be drawn off therefrom by the tire. It is therefore desirable to provide some means whereby the supply of paper to the tire can be interrupted when the wrapping or service is complete. Furthermore, (referring to Fig. 8) it will be understood that if the machine is used to apply two strips to the tire that one, such as the sealing strip *b*, must lag somewhat behind the strip *a* and that it will be necessary to take one or more turns of the strip *b* after the wrapping with the strip *a* is completed. It is therefore desirable to provide means to stop the supply of the strip *a* before the action of the machine in applying the strip *b* is terminated and in particular to stop the supply of the two strips at definitely separated times. Our present invention provides means for accomplishing this result, the particular mechanism for this being best seen in Figs. 2, 3, 4 and 5, to which we shall now refer. Referring particularly to Fig. 4, the strip *a* is led from its supply roll 43 through a guide consisting of an arm 55 pivoted at 57 to the shuttle and the coöperating jaw member 59 hinged to the end of the arm and pressed against the terminal 61 thereof by a spring 63. The jaws 59 and 61 form an open-sided guide for the strip *a*, the width of the meeting surfaces of these jaws being preferably less than that of the strip *a*. The jaw member 59, however, is laterally extended beyond the jaw 61, downwardly as seen in Fig. 5, to form a supporting surface at one side thereof and to the right, but does not project markedly beyond the right of the jaw 61 in line therewith. The purpose of this formation of the jaw will presently appear. The arm 55 is normally held in the full line position in Fig. 4 by means of a spring 65 which draws the same against stop 66.

Mounted on a bracket 67 adjacent the end guiding arm 65 is a cutting blade 69 which conveniently has a serrated edge. It will be understood that if the arm 55 is rocked in a clockwise direction to the dotted line position in Fig. 4, that the strip *a* will be forced against the blade 69 and severed and that no more will be drawn out to the tire, the operation of the wrapping mechanism as far as the strip *a* is concerned at once ceasing no matter whether the rotation of the shuttle 15 is continued or not. The severed end of the strip will be held between the jaws 59 and 61 with its projecting end resting on the supporting surface of the jaw 59. After the strip is severed the spring 65 will act to return the arm to the full line position, drawing it against stop 66.

The strip *b* may be led from its roll 45 over the supporting surface 49 and, as best shown in Fig. 4, thence to the tire over a guide arm 73 pivoted to the shuttle at 75. A spring 77 is attached to the arm and normally tends to move the same to the dotted line position of Fig. 4, but it is held against the force of that spring and in the full line position by the tension of the strip thereover. Now if the arm 73 is rocked against the tension of the paper to the dotted line position the strip *b* will be forced against blade 69 and severed and the wrapping operation as far as the strip *b* is concerned will cease and terminate. The arm 73 will not, however, return to the full line position automatically as the spring 77 forces it in the other direction and the

tension of the strip *b* which acted against the spring is no longer present. Beneath the end of the arm 73, however, as seen in Fig. 5, is the projecting supporting surface of the jaw 59. The terminal of the strip *b* will thus be held between the arm 73 and the jaw 59.

When two strips are used as in the present embodiment of the invention it will be recalled that one of them has adhesive applied thereto. Herein the strip *b* is either daubed with adhesive in its passage over the surface 59 or has adhesive which is already thereon moistened. The end of the strip passing over the arm 73 will therefore be covered with wet adhesive and if it is forced down as described onto the supporting surface 59 it will contact with the projecting end of the strip *a* held by the jaws 59 and 61 and adhere thereto. The wrapping operation will thus have been terminated as regards both strips but the two ends will be held fastened together in readiness to be applied as a unit to a new piece of work. When the two strips are drawn out to apply them to the new work the strip *b* will be tensioned and the arm 73 will be once again raised to the full line position.

To operate the severing mechanism herein described at proper times, the pivots 57 and 75 of the arms 55 and 73 respectively, may be provided with arms 79 and 81, best seen in Figs. 3 and 5. Trips are provided so as to utilize the motion of the shuttle to rock the same and sever the strips. Referring particularly to Figs. 2 and 5, I have here shown a lever 83 pivoted to the frame of the machine and having arms 85 and 87 each of which carries a roll adapted to contact with one of the arms 79 and 81. A positioning segment 89 is provided for the lever 83 adapted to coöperate with the hand grip locking dog 91, of well known type.

Referring to Fig. 2, wherein the lever is shown in neutral position, it will be understood that if the handle is grasped and the lever rocked in a clockwise direction that the roll on the arm 85 will be thrown inward into the path of arm 79 (Fig. 5) to rock 55 and sever the strip *a*. The supply of strip *a* to the tire is thus stopped but the sealing strip *b*, which, as explained, lags somewhat behind the strip *a* is still fed forward and covers the convolutions of the strip *a* which have already been applied. After the strip *b* has made the required turns to complete the wrapping the lever 83 is swung to the opposite extreme to throw the roll on arm 87 into the path of arm 81 to rock arm 73 and thus to sever the sealing strip *b*.

In this connection it may be well to point out that there is an important coöperative relationship between the type of wiper herein disclosed and the mechanism whereby the strip is severed while the parts are still in motion. Referring to Figs. 1 and 2, the wiper 47, of which some details are novel to this application, comprises a broad strip of felt or the like, extending chord-like across the shuttle and adapted to be thrust aside from its chord-like position and bear against the tire T. One end of the strip may be secured to the shuttle by a turnbuckle or similar tightening device 93, the other end is preferably provided with a spring 95 forming a selvage therefor and to this spring we secure at different points in the width of the strip a number of tension springs 97 fastened at their opposite ends to the shuttle. When the tire is inserted in the machine it thrusts the wiper aside against the force of the springs 97 and the strip of felt thus bears yieldingly against the tire. The strip may be broad and the spring selvage 95 and also the plurality of springs 97 permit it to adapt itself to the circumferential curvature of the tire. This wrapper follows the strip about the tire in the rotation of the shuttle and not only firmly presses the adhesive surfaces of the strips together but smooths and tightens the wrapper in the course of its application. It will be understood that when the strips *a* and *b* are severed as described that there will be free flapping ends. The wiper, however, carries with it these free terminals in the general direction of their application and presses them down to their very ends.

Another important feature of the present construction is that by proper design of the parts the strips can be so severed that their ends will lie in at the inner circumference of the tire adjacent the beads where they are less likely to be broken loose when the package is handled so as to start the wrapping.

In machines of this character which have hitherto been known, the wrapping has been started manually by the operator, who would hold the end of the strip on the tire until it had been bound in place by the succeeding convolutions. This is obviously inconvenient and consumes considerable time. Therefore, we provide means for automatically applying the strip to the new tire, to initiate the wrapping or serving operation. Conveniently the mechanism may be so constructed that the introduction of the tire to the machine will operate to apply the strip thereto.

Referring to Fig. 1, it will be seen that the roll 31 is carried by a swinging bracket 98 and will swing out of the perpendicular when the tire is in position and of course when the tire is removed it will swing toward the right, a suitable counterweight 99 being provided, if necessary, to give the roll the re-

quired amount of travel. In the present embodiment of the invention this movement of the roll, due to the removal of the finished work and the introduction of a new unwrapped tire is utilized to apply the end of the strip to the tire to initiate the wrapping operation.

Referring now more particularly to Figs. 5, 6 and 7, after the strip or strips have been severed as described their ends remain resting on the supporting surface 59, held by the jaw 61 and the end of the arm 73. We shall first describe in a general way the mechanism which takes hold of the ends of the strips and applies them to the tire, disregarding for the time being the details of construction and the manner in which it is actuated. As seen in Fig. 5, the projecting portion of the supporting surface 59 is cut away in line with the coöperating jaw 61 and the side of the paper strips is thus projected in such a manner that they can be grasped by a pair of jaws and drawn out of the plane of rotation of the shuttle as indicated in Fig. 5. (In this figure the end of the strip *b* is broken away to show the strip *a* more clearly. Obviously the ends of the strips ordinarily are flush although, as they are joined, this is by no means essential.) The ends of the strips thus moved out of the plane are brought into proximity to the tire and when the machine is started the convolutions of the wrapping are bound around this projecting end firmly anchoring it into position. The operation is somewhat like the application of a "whipping" to the end of a rope in which the spare end of the cord which forms the "whipping" is laid lengthwise of the rope and bound in under the turns.

Referring now to Figs. 6 and 7 the mechanism which we have chosen for purposes of illustration embodies a rod 101 mounted to slide transversely to the plane of the shuttle in a bracket 103. The rod may also rotate on its axis. On the end nearest the wrapping mechanism the rod carries an arm 105 on which are mounted a pair of jaws 107, pivoted together in a manner similar to the blades of scissors. A spring 109 normally holds these jaws closed and the ends corresponding to the handles of the scissors carry anti-friction rolls 110. A spring 111 is provided which normally draws the slide to the left and the tension of which acts to hold the arm 105 with its extension 113 (shown in Fig. 7) in contact with stop surface 117 on bracket 103 so that the arm occupies the full line position of Fig. 7. Also carried by the bracket 103 is a cam surface 119 having the form best shown in Fig. 6. If the slide is moved to the right, viewing Fig. 6, the rollers 110 will ride over the diagonal faces 121 of the cam member 119 and the gripping jaws will be opened. They will then rest on the parallel surfaces 123 and the jaws will remain open until they pass over the end and out of engagement with the surface 119. As illustrated in dotted lines in Fig. 6 this provides for opening the jaws to grip the end of the wrapping strip which is presented adjacent the supporting surface 59 and for closing them thereon.

The strip being thus held by the gripping jaws 107, the tire T may be inserted in the machine and the rotation of the shuttle in a counter-clockwise direction, viewing Fig. 2, commenced. It will be seen that the tension on the strip due to the rotation of the shuttle will tend to rock the arm 105 in a clockwise direction to the dotted line position shown in Fig. 7. As soon as it has been swung sufficiently far to clear the end of the cam member 119, the spring 111 will act to draw the slide to the left, viewing Fig. 6, and thus to pull the end of the wrapping strip out of the plane of the shuttle. The continued rotation of the shuttle will draw the arm 105 down until the extension 125 strikes the stop 117 in which position the end of the strip held by the jaws 107 will lie closely adjacent the tire but to the rear of the shuttle viewing Fig. 2. In the continued operation of the machine the tire is rotated toward the reader, viewing Fig. 2, and consequently the turns of the wrappings will lie over the end, which is stretched out circumferentially of the tire, and will firmly bind it in position.

The tension on the strip which rocks the arm 105 is transverse of the pivoted gripping jaws 107. As the wrapping operation proceeds, however, the strain is longitudinal of these jaws and the end of the strip is thus drawn free from them before they can interfere with the application of the service and the arm is permitted to return to the full line position in Fig. 7 under the action of the spring 111. For this purpose the jaws 107, as seen in Fig. 7, may have interengaging portions providing a tortuous transverse passage therethrough so as to prevent the strip from being drawn loose by a transverse strain, although permitting it to be readily disengaged by a longitudinal pull.

To actuate the mechanism just described the movement of the roll 31 when tires are removed from and inserted in the machine, may be utilized. For this purpose the swinging bracket 98 on which the roll is suspended may have an extension 129 adapted to cooperate with an abutment 131 on the arm 105, this abutment conveniently taking the form of a screw to permit adjustment thereof. When the wrapping of a tire is completed the strips are severed and the machine is stopped. To permit the withdrawal of the tire the break 27 in the shuttle (Fig.

2) must be brought to the position shown and the ends of the strips on the supporting surface 59 are thus brought into alinement with the jaws 107. When the tire is withdrawn the roll 31 swings to the right under the influence of the counterweight 99 and the extension 129 strikes the abutment 131 and moves the slide to the dotted line position in Fig. 6, the jaws 107 being operated by the cam 119 as described. A new tire to be wrapped may now be inserted and the roll 31 will swing back to the position shown in Fig. 6. When the machine is started the tension on the strip caused by the rotation of the shuttle will swing the arm 105 as described and the end of the strip will be moved out of the plane of the shuttle and into close proximity to the side of the tire ready to be bound in position by the convolutions of the strip serving.

It will thus be seen that we have provided a mechanism much more nearly automatic than those hitherto known. The operator by manipulating the handle 91 can sever the strip or strips which are used in the wrapping operation without halting the action of the machine and the ends of the main supply of paper are held in convenient position for application to the next piece of work. This is of advantage even if the application is to be made by hand and it may be noted in passing that the jaws 59 and 61 being open to the side are easy to "thread" when the machine is first put in operation. By the means described, however, the operator is relieved of the trouble and difficulty of manually applying the strip end to the new article to be wrapped, this being done automatically by the machine when the work is changed. A further advantage arises from the fact that the operator does not place his hands in proximity to moving parts of the machine and it is thus possible to operate the entire mechanism at high speed.

Both the severing mechanism and the automatic end positioning mechanism are applicable to machines which wrap the tire with a single strip, whether the convolutions of this strip are secured together or not. But if two strips are used, which is desirable since a certain economy of paper is effected and a greater output made possible, means are provided for severing the two strips at different times as required and also for holding together the ends of the strips of the main supply so that they may be handled as a unit in applying them to a new piece of work, whether this application is done automatically or manually.

We have described in considerable detail the particular form of mechanism here shown as applied to a machine for wrapping tires or similar toric articles. It will be understood, however, that we have done this in order that the particular embodiment of our invention disclosed might be more readily understood and not because the details of construction are of the essence of the invention.

What we do claim and desire to secure by Letters Patent is:

1. A machine of the class described comprising, in combination means for supporting an article, strip-serving means coöperating therewith and means utilizing the motion of said parts to sever the strip.

2. A machine of the class described comprising, in combination means for supporting an article, strip-serving means coöperating therewith and arranged to apply two strips to the article in break-joint relation and means to sever one said strip without interrupting the application of the other.

3. A machine of the class described comprising, in combination means for supporting an article, strip-serving means coöperating therewith and arranged to apply two strips to the article in break-joint relation and means to sever said strips respectively at different times.

4. In a machine of the class described a strip-serving mechanism including strip-supply means, a guide for the strip, a cutting blade adjacent said guide, a member to force the strip against said blade and means to trip said member.

5. In a machine of the class described a strip serving mechanism comprising means to supply a primary strip and means to supply a sealing strip, a supporting surface adjacent the paths of said strips to the article to be served, a blade adjacent said paths, devices arranged for successive operation to force said strips respectively against said blade, the latter acting device arranged to press both strips against said surface.

6. In a machine of the class described a strip serving mechanism comprising means to supply a primary strip and means to supply a sealing strip, a guide for one strip, a movable guide for the other strip, said first guide having a surface opposite the second guide, said second guide being normally held away from said surface by the tension of the strip and means to sever the strips.

7. A machine of the class described comprising, in combination, means to serve an article with a primary strip including an open sided pair of jaws, one of said jaws having a projecting supporting surface, means to serve the article with an adhesive sealing strip breaking joint with the primary strip and means to sever said strips and thereupon to press said strips together against said supporting surface.

8. A machine of the class described comprising, in combination, means to support

an article, a rotary strip-carrying shuttle for wrapping a strip about the article and automatic means to adjust the strip end adjacent the article for initiating the wrapping operation.

9. A machine of the class described comprising, in combination, means to support an article, a rotary strip-carrying shuttle for wrapping a strip about the article, means to sever the strip, means to hold the strip end after severance and means for adjusting the strip end adjacent an article supported to initiate a new wrapping operation.

10. A machine of the class described comprising, in combination, means to support an article, a rotary strip-carrying shuttle for wrapping a strip about the article, means to sever the strip, means to hold the strip end after severance and means automatically effective on introduction of an article to the machine to apply said end to the article.

11. A machine of the class described comprising, in combination, coöperating article supporting and strip-serving means and means rendered effective by the introduction of an article to the machine for adjusting the strip end adjacent the article for initiating the serving operation.

12. A machine of the class described comprising, in combination, positioning means for an article including a swinging guide, a ring-like shuttle for applying a strip to the article and including holding means for the end of the strip, jaws movable with said guide in a path adjacent said holding means and means to operate the jaws.

13. A machine of the class described comprising, in combination, positioning means for an article, a ring-like shuttle coöperating therewith and carrying strip supply means, holding means for the strip end mounted to move into close proximity to the article on movement of the shuttle.

14. A machine of the class described comprising, in combination, means to feed an article and means to revolve a strip supply about the article, jaws to hold the strip end adjacent the article, said jaws being open in the direction of feed thereof whereby to permit the strip ultimately to be released therefrom under lateral draft.

15. A machine of the class described comprising, in combination, means to feed an article and means to revolve a strip supply about the article, jaws to hold the strip end arranged to move into proximity to the line of feed under the draft of revolution and being open in the direction of feed of the article whereby to permit the strip ultimately to be released by the draft of feed.

16. A machine of the class described comprising, in combination, means to feed an article in a plane, strip applying means arranged to revolve thereabout in a transverse plane, means to sever the strip after operation of the machine and means rendered effective on the removal of the article to grasp and hold the strip end.

17. A machine of the class described comprising, in combination, means to feed an article in a plane, strip applying means arranged to revolve thereabout in a transverse plane, and means temporarily to hold the strip end out of said transverse plane.

18. A machine of the class described comprising, in combination, means to feed an article in a plane, strip applying means arranged to revolve thereabout in a transverse plane, and means rendered effective on the introduction of an article to said mechanism to bring and temporarily to hold the strip end out of said transverse plane.

19. A machine of the class described comprising, in combination, means to feed an article in a plane, strip applying means arranged to revolve thereabout in a transverse plane, means to sever the strip after operation of the machine including means for holding the end of the strip and means to carry and temporarily to hold said end out of said transverse plane.

20. A machine of the class described comprising, in combination, means to feed an article in a plane, strip applying means arranged to revolve thereabout in a transverse plane, means to sever the strip after operation of the machine including means for holding the end of the strip, and means rendered effective on introduction of an article to said mechanism to carry and temporarily to hold the end out of said transverse plane.

21. A machine of the class described comprising positioning devices for the work, one such device being arranged to be displaced by the work, a strip-serving shuttle, means associated with said shuttle for positioning the strip end, a gripping device arranged for movement toward said shuttle to take hold of the strip end, said device adapted to be actuated by movement of said work positioning device when the work is changed.

22. A machine of the class described comprising positioning devices for the work, one such device being arranged to be displaced by the work, a strip-serving shuttle, a rotatable slide movable transversely to the shuttle, an arm on the slide, grippers carried by the arm, retractile and torsional spring means controlling the slide, said slide being adapted to be actuated by movement of said work positioning device when the work is changed.

23. A machine of the class described comprising, in combination, work supporting means, a strip-serving shuttle, means associated with the shuttle for positioning the strip end, a rotatable slide movable trans-

versely to the shuttle, an arm on the slide, grippers carried by the arm, retractile and torsional spring means controlling the slide and means for operating the slide.

24. A machine of the class described comprising, in combination, work supporting means, a strip-serving shuttle, means associated with said shuttle for positioning the strip end and a gripping device to take hold of the strip end, said device being mounted to move into close proximity to the work under the tension caused by the moving shuttle.

25. A machine of the class described comprising, in combination, work supporting means, a strip-serving shuttle, means associated with said shuttle for positioning the strip end and a gripping device to take hold of the strip end and adapted to draw it from the plane of shuttle rotation, said device being mounted to move into close proximity to the work under tension caused by the moving shuttle.

26. A machine of the class described comprising, in combination, work supporting means, a strip-serving shuttle, means associated with said shuttle for positioning the strip end, gripping jaws movable toward and from the plane of rotation of said shuttle, and means for operating said jaws in their movement to cause them to take hold of said end.

27. A machine of the class described comprising, in combination, work supporting means, a strip-serving shuttle, means associated with said shuttle for positioning the strip end, gripping jaws movable toward and from the plane of rotation of said shuttle, and means for operating said jaws in their movement to cause them to take hold of said end, said jaws being mounted to move into close proximity to the work under the tension caused by the moving shuttle.

28. A machine of the class described comprising, in combination, means for supporting an article, strip-serving mechanism adapted and arranged to apply a primary strip and a sealing strip breaking joint with the first, a wiper adapted to bear on the article and follow the strips about the same and means successively to sever said strips.

29. A machine of the class described comprising, in combination, means for supporting an article, strip-serving mechanism comprising an annular shuttle, a wiper comprising a band stretching chord-like across the shuttle and adapted to be displaced by the article and means for severing the strip.

30. In a machine of the class described an annular shuttle, a wiper extending chord-like across the shuttle and comprising a band having a spring border or selvage at an end thereof.

31. In a machine of the class described an annular shuttle, a wiper extending chord-like across the shuttle and comprising a band having a spring border or selvage at an end thereof and a group of springs attached to said border and securing the band to the shuttle.

32. In a machine of the class described an annular shuttle, a wiper extending chord-like across the shuttle and comprising a broad flat band and a plurality of springs fastened to the band at different points along the width thereof and securing the band to the shuttle.

In testimony whereof, we have signed our names to this specification.

EDWARD H. ANGIER.
WILLIAM M. WHEILDON.