

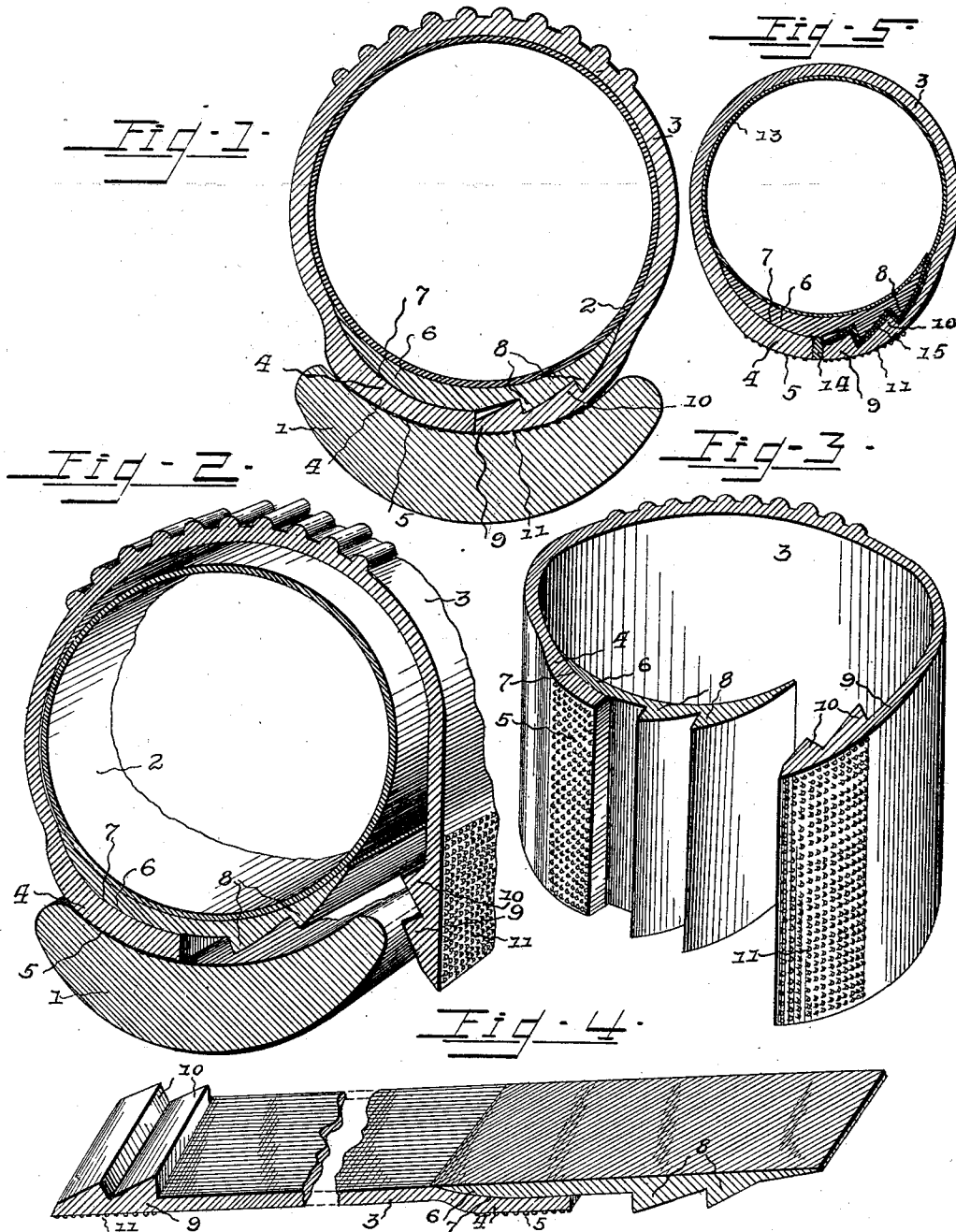
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Patented Apr. 11, 1899.

W. I. DREISBACH.
PNEUMATIC TIRE.

(Application filed Jan. 26, 1898.)

(No Model.)



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UNITED STATES PATENT OFFICE.

WILLIAM IRVIN DREISBACH, OF WILLIAMSPORT, PENNSYLVANIA.

PNEUMATIC TIRE.

SPECIFICATION forming part of Letters Patent No. 622,796, dated April 11, 1899.

Application filed January 26, 1898. Serial No. 668,052. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM IRVIN DREISBACH, a citizen of the United States, residing at Williamsport, in the county of Lycoming and State of Pennsylvania, have invented a new and useful Pneumatic Tire, of which the following is a specification.

My invention relates to improvements in inflatable or pneumatic tires of that class which employ an outer sheath in connection with the inner inflatable tube, and it is designed more particularly as an improvement on the tire disclosed in United States Letters Patent No. 588,557, granted to me August 24, 1897.

One of the objects of my present improvement is to dispense with the tape or "piping" disclosed in the patent issued on my prior invention for holding the edge which is first seated in place on the wheel-rim, and a further object is to provide an improved construction of the outer tube or sheath which will hold itself in place and permit of the ready insertion and interlocking of the free edge of the sheath with the edge which is first fitted to the wheel-rim beneath the inflatable inner tube.

With these ends in view my invention consists in the novel construction and arrangement of parts, which will be hereinafter fully described and claimed.

To enable others to understand my invention, I have illustrated the preferred embodiment thereof in the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a vertical transverse sectional view of my improved tire seated on a wheel-rim and showing the edges thereof interlocked with each other. Fig. 2 is a vertical cross-sectional view illustrating the manner of applying the outer sheath or tube to the wheel-rim. Fig. 3 is a detail perspective view of the outer sheath or tube removed from the wheel-rim and the inner tube. Fig. 4 is a detail perspective view of the outer case or tube spread or flattened out and looking at the inner face thereof to show the transverse arrangement of the fabric forming the locking-flap to the fabric of the case or tube proper. Fig. 5 is a sectional elevation of another em-

bodiment of the tire, in which a single tube is used similar to a hose-pipe tire.

Like numerals of reference denote like and corresponding parts in each of the several figures of the drawings.

Referring by numeral to the drawings, 1 designates the wheel-rim of an ordinary bicycle, and 2 is an inflatable inner tube of a pneumatic tire. The rim 1 may be the ordinary wood or metallic rim of a bicycle or other vehicle, and the inflatable tube 2 is of any suitable or preferred construction, because no novelty for these devices is herein claimed, as they form no part of my present invention.

My improvement resides in the construction of the outer tube or sheath 3, which is adapted to form a protection to the inner tube 2 and to be seated on the wheel-rim in a manner to permit of ready removal of said outer tube for the purpose of obtaining access to the inner tube, whereby said inner tube may have its punctures repaired in a very easy manner.

My improved outer tube or sheath 3 relates more particularly to that class which are divided longitudinally at the line where said tube or sheath is seated upon the wheel-rim; but said outer tube or sheath is not interlocked with the wheel-rim in any manner. On the contrary, the inner seat portion of the outer tube or sheath is peculiarly constructed with a view to hold itself firmly in position on the wheel-rim without, however, attaching the same directly thereto by interlocking devices, as in some constructions of tubes or sheaths which have preceded my invention; but such construction of the outer tube or sheath also provides for the ready releasing of the edges thereof when the inner tube is deflated or partially deflated, and also permits the ready interlocking of the two edges of the divided outer tube or sheath.

In the practical construction of my improved outer tube or sheath one edge 4 thereof is thickened transversely to form a bearing or seat face adapted to be applied to a wheel-rim, and this thickened bearing-face 4 of the outer tube or sheath is externally roughened or corrugated to enable the same to have good frictional contact with the wheel-rim.

In connection with the thickened bearing edge 4 of the outer tube or sheath I employ a locking-flap 6, which is formed of a separate piece of fabric and united permanently to the inner face of the thickened bearing edge 4. This locking-flap is united at one edge thereof to the thickened bearing edge 4 of the outer tube or sheath by any suitable means—as, for instance, by vulcanizing or cementing the flap and bearing edge together along the line indicated at 7, and in thus uniting the locking-flap with the bearing edge 4 of the sheath care should be exercised to have the threads of the fabric forming the locking-flap at a different angle to the threads of the fabric forming the sheath or tube 4 in order that the locking-flap may be united or joined with the tube or sheath 3 in a manner to prevent stretching of the locking-flap under the strain or pull of the free edge of the sheath or tube when it is interlocked therewith as will presently appear.

The locking-flap 6 projects a suitable distance beyond the thickened bearing edge 4 of the tube or sheath, and on the under face of the locking-flap, or on that face adjacent to the wheel-rim, the locking-flap is provided with one or a series of integral longitudinal ribs 8. The other edge 9 of the outer tube or sheath 3 is provided on its inner face with one or a series of longitudinal ribs 10, which are spaced apart a distance corresponding to the space of the longitudinal ribs 7 of the locking-flaps 6, and said free edge 9 of the outer tube or sheath is adapted to lap under the locking-flap 7 in a manner to present the longitudinal rib or ribs 10 thereon opposite to the longitudinal rib or ribs 7 of said locking-flap, whereby the two series of ribs on the free edge of the sheath and the flap are designed to interlock with each other when the outer tube or sheath is properly fitted to the wheel-rim to inclose the inner tube 2 of the tire.

While reference has been made to the fact that there may be one or a series of the continuous interlocking ribs 8 and 10, it may be explained at this point that while one rib on the free edge of the tube and on the locking-flap 6 would provide an operative structure, still in actual practice it has been found absolutely essential to employ a plurality of the said ribs to prevent disengagement of the interlocked edges and to insure a uniform contraction of the tire against the entire concave face of the rim. The use of a plurality of interlocking ribs is also rendered necessary, since it is desirable that the abutting edges of the tube meet substantially at the center of the rim and that the bearing-faces 5 and 11 are substantially of equal extent or area.

One of the important features of my improved construction of the outer tube or sheath resides in the thickening of the edge 4 of said tube and in uniting the locking-flap 6 to the thickened edge 4, said flap having a longitudinal rib or ribs 8. This construction is important in a tire of this class, because

the thickened edge enables the tube or tire to be held in place on the wheel-rim by contraction of the tire or tube itself, and the edge of the outer tube or sheath, which is seated upon the wheel-rim, is built up or raised a distance equivalent to the thickness of the rib or ribs 8, whereby the ribbed edge 9 of the outer tube may be adjusted beneath the locking-flap to have proper engagement of the two series of ribs with each other and enable the bearing-face of the free edge 9 to lie substantially flush with the bearing-face 5 of the edge 4 of said outer tube or sheath. The outer face of the thickened edge 4 of the sheath or tube 3 is roughened or "pebbled" to form the bearing-face 5, and in a similar manner the outer face 11 of the free edge 9 of said outer tube is roughened or pebbled, as at 11, thus providing another bearing-face on the tire. It will be apparent that the edges 4 9 of the tire may be adjusted into close relation to each other to have their bearing-faces 5 11 substantially flush with each other, and at the same time the rib or ribs 10 of the edge 9 have the proper interlocking engagement with the rib or ribs 7 of the flap 6. The outer tube or sheath is thus adapted to have a firm seat upon the wheel-rim, because the bearing-faces 5 11 thereof lie substantially flush with each other.

In my invention the tire or tube has one edge thereof built up to provide the thickened edge, and this increase in the thickness of the tire edge is furthered by the union of the flap with the thickened edge, although it is evident that the flap may be made as an integral part of the tire or tube. As a result of this construction the tire or tube is made to hold itself in place solely by contraction of the tire upon the wheel-rim, provision is made for interlocking of the flap with the free edge of the tire, and the pressure of the air in the tube or tire increases the contraction of the tire upon the wheel-rim.

The thickened edges of the tire or tube are fitted to bear upon the wheel-rim practically throughout the width of said rim, and to enable the free thickened and ribbed edge of the tire or tube to conform accurately to the curve of the wheel-rim I make the ribs 8 on the flap 6 of different diameters and make the outer rib 10 on the free edge of the tire slightly beveled or inclined—say one-sixteenth of an inch—whereby the free edge has the proper interlocking engagement with the flap and the two thickened edges of the tire conform accurately to the contour of the wheel-rim and seat firmly thereon, so that the tire or tube may have the necessary contraction on the wheel-rim.

In operation the bearing-faces 5 11 of the two edges of the divided tube or sheath 3 are firmly seated on the concave face of the wheel-rim, and the ribs 7 10 engage with each other to prevent expansion of the outer tube and separation of the edges thereof. In the event of a puncture of the inner tube the lat-

ter becomes deflated or partially deflated, thus removing the pressure from the lapped edges of the outer tube. The operator is now able to withdraw the edge 9 of the outer tube from engagement with the flap 6, and the edge 9 may now be raised to permit access to be obtained to the inner inflatable tube 2, the thickened edge 4 of the outer tube remaining seated upon the wheel-rim. The inner tube may now be easily repaired to effectually seal the puncture therein, and said inner tube is then replaced within the outer tube, and the edge 9 of the latter is adjusted beneath the locking-flap 6 for the rib or ribs 10 to engage with the rib or ribs 7 on said flap. The inner tube is now inflated in the usual way, and the pressure thereof upon the outer tube causes the interlocked edges 4 9 thereof to be held firmly together and upon the wheel-rim.

In one form of my invention the fabric forming the locking-flap is cut on a bias, as represented by Fig. 4, and one edge of this flap is united in any suitable way to the thickened edge 4 of the tube; but I would have it understood that I do not restrict myself to the particular use of the bias-cut fabric, because it is evident that the fabric for the flap may be cut straight or lengthwise or from suitable material and vulcanized to the thickened edge 4, thus preventing the edge 4 and the flap 6 from stretching in relation to each other along the joint, but permitting contraction of the outer cover or sheath when the tire is inflated.

In my tire it is necessary to make the ribs or corrugation of the thickened edge and the flap of proper thickness or depth and width to cause them to remain interlocked when the tire is deflated, thus overcoming one of the practical objections to prior devices in this art.

In the drawings I have illustrated the thickened edges 4 9 of the divided outer case or tube as having the outer faces thereof provided with the integral corrugations or "pebbling;" but I would have it understood that I do not limit myself strictly to this construction, because I am aware that metal may be united to the thickened edges of the outer tube or case to provide a frictional bearing-surface for said outer case upon the wheel-rim. If desired, other suitable material than metal may be united to the tube or case to secure the desired frictional contact between the wheel-rim and said case.

While I have shown and described my tire as especially adapted for use in connection with an inner tube, thus forming a double-tube tire, it is to be understood that I do not strictly limit myself to the use of the cover or sheath in connection with an inner tube, because I am aware that the inner surface of the outer tube may be coated with rubber for the purpose of rendering the tube air-proof, thus making the outer tube serve the purpose of the tire itself in a manner similar to the device known as "hose-pipe" tires. This embodiment of the invention is represented

by Fig. 5 of the drawings, in which the inner surface of the divided tire is coated with a thin film or layer of rubber, as at 13. The outer face of the flap in the first groove adjacent to the abrupt shoulder formed by the thickened edge of the tire is provided with a sealing-layer of soft rubber 14 and the ribbed or corrugated face of the flap is coated with a thin film or layer of rubber at 15. The surfaces of the divided tire are thus adapted to be pressed together to secure tight joints, and the tire is rendered air-tight by the presence of the sealing-layer 14 of the soft rubber.

The tire is rendered air-tight by the presence of the films and sealing-layers, owing to the interlocking of the ribs or corrugations, and this air-tight feature is furthered by the pressure of the air in the tire.

It is evident that changes in the form and proportion of parts may be made by a skilled mechanic without departing from the spirit or sacrificing the advantages of the invention.

Having thus described the invention, what I claim is—

1. In a pneumatic tire, a divided tube provided on the inner face of its free edge with a plurality of locking-ribs, and having at its other edge a thickened or built-up portion, both edges of the tube forming exterior bearing-faces adapted to be seated against the concave face of an ordinary wheel-rim, and to lie substantially flush with each other, and a locking-flap projecting from and beyond the thickened or built-up portion and also provided with a plurality of ribs interlocking with the corresponding ribs at the free edge of the tube, whereby the thickened or built-up edge compensates for the combined thickness of the interlocking portions, and permits the two edges of the tube to be seated flush on the rim and held firmly thereon by the contraction of the tire without any interlocking or fastening connection between the latter and the rim, substantially as set forth.

2. In a pneumatic tire, a divided tube provided on the inner face of its free edge with a rib or ribs, and having at its other edge a thickened portion, and a locking-flap projecting from and beyond said thickened portion and provided with a rib or ribs detachably interlocking with the corresponding rib or ribs at the free edge of the tube, both edges of the tube closely abutting and having bearing-faces of substantially equal extent or area, arranged flush with each other, and adapted to be held firmly against the rim by the contraction of the tire, substantially as set forth.

3. In a pneumatic tire, a divided tube provided on the inner face of its free edge with a rib or ribs, and having at its other edge a thickened or built-up portion, and a locking-flap projected from and beyond said thickened portion and provided with a rib or ribs detachably interlocking with the corresponding rib or ribs at the free edge of the tube, both edges of the tube abutting and having exteriorly-

roughened bearing-faces of substantially equal extent or area arranged flush with each other so as to form a substantially continuous roughened surface adapted to bear against the concaved side of an ordinary rim and held thereon solely by the contraction of the tire, substantially as set forth.

4. In a pneumatic tire, a divided tube provided on the inner face of its free edge with a plurality of locking-ribs, and having at its other edge a thickened portion, and a locking-flap projecting from and beyond said thickened portion and also provided with a plurality of ribs interlocking with those at the free edge of the tube, all of said locking-ribs being continuous, and the locking-ribs of said flap being of different diameters, substantially as set forth.

5. In a pneumatic tire, a divided tube provided on the inner face of its free edge with

a plurality of locking-ribs, and having at its other edge a thickened or built-up portion carrying a locking-flap also provided with a plurality of ribs interlocking with those at the free edge of the tube, all of said locking-ribs being continuous, and the outer rib on the free edge of the tube being beveled or inclined, whereby said free edge has a proper interlocking engagement with the flap and the two thickened edges of the tube are caused to accurately conform to the contour of the rim, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

WILLIAM IRVIN DREISBACH.

Witnesses:

JOHN H. SIGGERS,
ROBT. E. CRUMP.