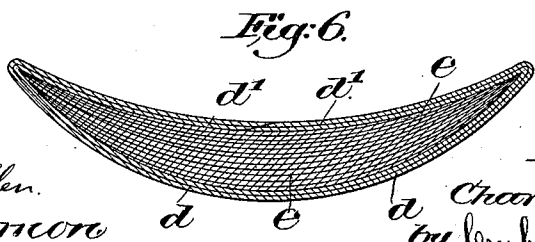
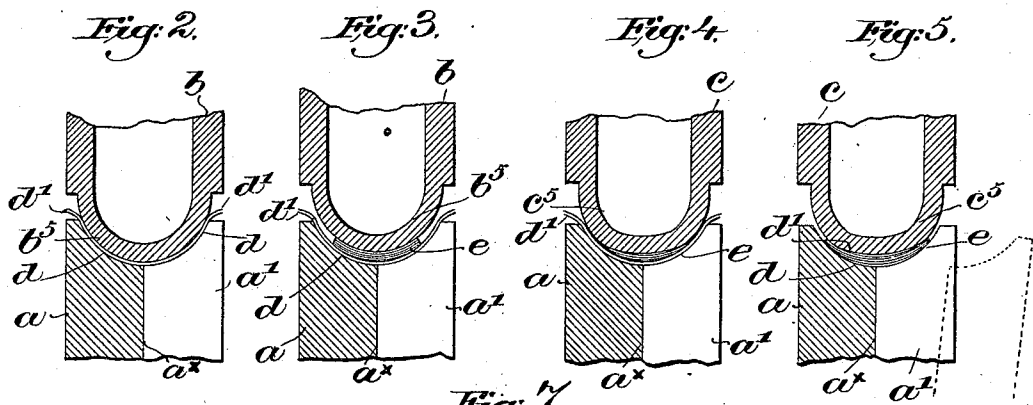
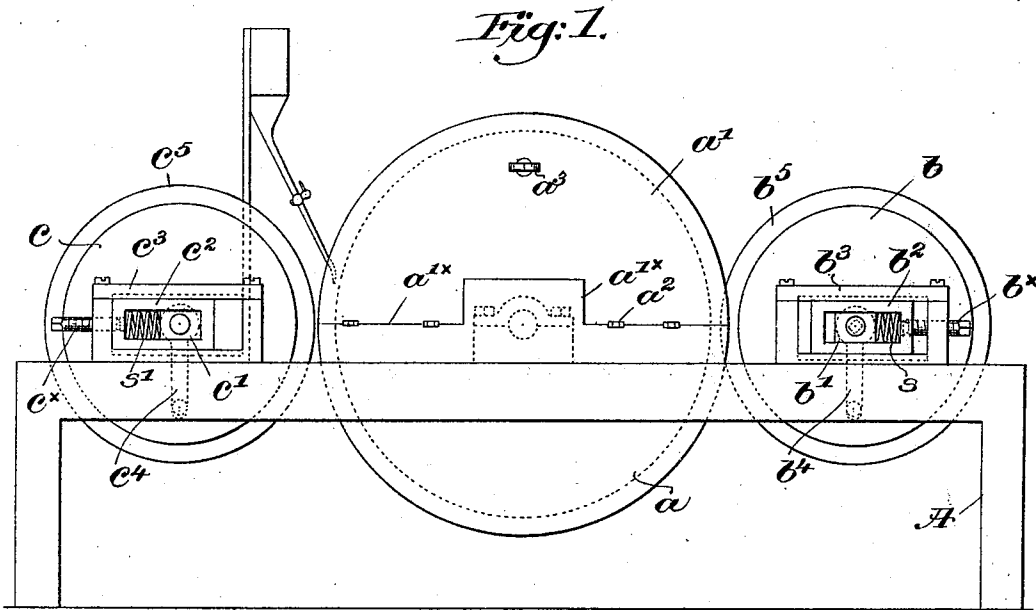


(No Model.)

C. F. COWDREY.  
WHEEL RIM AND METHOD OF MAKING SAME.

No. 522,047.

Patented June 26, 1894.



Witnesses.  
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# UNITED STATES PATENT OFFICE.

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## WHEEL-RIM AND METHOD OF MAKING SAME.

SPECIFICATION forming part of Letters Patent No. 522,047, dated June 26, 1894.

Application filed March 21, 1894. Serial No. 504,569. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES F. COWDREY, of Fitchburg, county of Worcester, State of Massachusetts, have invented an Improvement in Wheel-Rims and Methods of Making the Same, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object the production of a light, strong and moisture-repellent wheel rim, which can be readily made of any desired density and configuration, presenting no joints externally.

In accordance therewith my invention consists, in a wheel rim, of a fibrous annular body portion, and an inclosing sheath of fibrous material bent around and cemented to said body portion, substantially as will be described.

Other features of my invention will be hereinafter described and particularly pointed out in the claims, the method of making the wheel rims also forming a part of my invention.

Figure 1 represents in side elevation one form of apparatus which may be used in making wheel rims embodying my invention. Figs. 2, 3, 4 and 5 represent the rim in various successive stages of its manufacture, the forming mechanism being shown in section. Fig. 6, on an enlarged scale represents in cross section a rim embodying my invention; and Fig. 7 is a modification to be described.

Wheel rims have been made of rings of wood veneer, inserted one within the other in such manner that the successive layers or plies break joints, the latter being cemented together and molded to shape, such rims being light and strong, but they are difficult to make, and though heavily coated with varnish are vulnerable to moisture, which will find its way between the plies or layers. I overcome such objections and at the same time produce a lighter and equally strong rim by forming the same of an inner body of fibrous material, which may be either homogeneous or composed of layers or plies, and surrounding said body portion with an inclosing sheath which is substantially continuous and water-proof.

Referring to Fig. 1, I have shown a rotat-

able "former"  $a$  and adjustable pressure rolls  $b$  and  $c$  mounted upon a suitable support A, the face of the former  $a$  being concaved peripherally to correspond with the shape of the inner face of the rim to be made, the former being divided centrally throughout substantially half its extent in the line  $a^x$ , Figs. 2 and 5, and transversely on the irregular line  $a'^x$ , Fig. 1, the sector  $a'$  so separated being hinged at  $a^2$  to the main portion of the former, and normally held in place by a suitable catch  $a^3$ , for a purpose to be described.

The pressure rolls  $b$  and  $c$  are mounted to rotate in bearings  $b'$  and  $c'$  respectively, longitudinally movable in guides  $b^2$  and  $c^2$ , strong springs  $s$  and  $s'$  being interposed between the bearings and the outer ends of the guides. The guides themselves slide in ways  $b^3$  and  $c^3$  secured rigidly to the frame A, and are adjusted and held in position in said ways by suitable screws  $b^x$  and  $c^x$ .

Rotation may be imparted to the rolls  $b$  and  $c$  in any desired manner, and I have herein shown by dotted lines cranks  $b^4$  and  $c^4$  for such purpose. The peripheries  $b^5$  and  $c^5$  of the pressure rolls are convex, as clearly shown, the periphery  $b^5$  being of substantially the same curvature as the concave periphery of the "former"  $a$ , while the periphery  $c^5$  of the roll  $c$  corresponds to the shape of the peripheral or tire-receiving groove to be given to the outer face of the rim, the pressure rolls preferably being made hollow, as shown in Figs. 2 to 5, to receive steam or other suitable heating medium.

In making a rim in accordance with my invention the roll  $b$  is adjusted until its periphery  $b^5$  contacts with the concaved face of the "former"  $a$ , and I apply a strip  $d$  of suitable material to the "former," and wind it around it preferably two or more times, depending upon the thickness and nature of the material, preferably paper, though other suitable fibrous material, such as thin leather board, may be used, applying cement to the strip from a suitable holder B, Fig. 1, after the first turn has been made around the "former," the pressure roll  $b$  pressing the supposed layers or plies closely together, the cement uniting them. When a ring of sufficient thickness has been thus formed, I

either take a narrower strip of material, severing the first strip, or narrow the first strip, and wind that upon the plies already on the "former," applying the cement as described until the narrow plies or layers *e*, Fig. 3, form a compact body portion, the edges *d'* of the strip *d* first applied projecting considerably beyond said body portion, as clearly shown in Figs. 3 and 4. The pressure roll *b* may then be withdrawn and the roll *c* brought into position to act upon the layers or plies *e* forming the body portion of the blank, the pressure being increased as the roll *c* and "former" *a* are rotated until the body portion has been compressed into the proper shape, as shown in Figs. 4, 5 and 6. At this point the roll *c* is withdrawn sufficiently to permit the edges *d'* of the strip *d* to be folded over inward upon the concave outer face of the body portion, and secured by the cement, after which pressure is again applied by the roll *c* until the edges *d'* have been securely pressed into place. This is best shown in the enlarged Fig. 6, and it will be observed that the strip *d* thus forms an inclosing sheath for the body portion, and substantially seamless at all exposed portions of the rim, for the edges *d'* are brought over upon the grooved outer face of the rim, and are closed and protected not only by the cement, but by the tire when in place. With this construction it is almost an impossibility for moisture to penetrate the rim, as the cement may in itself form a waterproof coating, and in addition, a waterproofing varnish or composition may be applied to the rim.

To remove the completed annular rim from the "former" *a*, the catch *a*<sup>3</sup> is loosened, the part *a'* turned outward upon its hinges into the position shown by dotted lines Fig. 5, and the rim can then be readily taken off, the "former" having its bearings upon the rear side only, see dotted lines Fig. 1.

In the modification, Fig. 7, the body portion *e*<sup>x</sup> is formed of homogeneous fibrous material compressed and molded to shape in any suitable manner, and the outer inclosing sheath *d*<sup>x</sup> is applied thereto in strip form, the projecting edges being turned over upon and cemented to the body.

My invention is not restricted to the precise construction herein shown, as the number, thickness and character of the turns of material may be varied according to circumstances, and so too, the sheath and body portion of the rim may be made of one continuous strip wider in one portion than in another, or a plurality of strips of different widths may be employed without departing from the spirit of my invention.

I claim—

1. A rim for wheels consisting of a fibrous annular body portion, and an inclosing sheath of fibrous material bent around and cemented

to said body portion, substantially as described. 65

2. A rim for wheels consisting of a fibrous annular body portion having a concave periphery, and an inclosing fibrous sheath bent around said body portion and having its edges bent over upon and cemented to its concave face, substantially as described. 70

3. A rim for wheels consisting of a body portion composed of a strip of material wound upon itself to form a plurality of continuous layers or plies, and cemented together, and an inclosing sheath of fibrous material bent around and secured to said body portion, substantially as described. 75

4. A rim for wheels consisting of paper in strip form wound upon itself to form a plurality of layers or plies, and cemented together, and compressed to form a tire groove, the inner or first wound layers being of greater width, the projecting edges being turned over upon the superposed narrower plies and secured thereto, substantially as described. 80 85

5. A rim for wheels consisting of paper in strip form wound upon itself to form a plurality of layers or plies, and cemented together, the innermost layer or ply being of greater width than the outer ones, and adapted to be folded thereover, substantially as described. 90

6. A rim for wheels consisting of two strips of similar material wound one upon another to form a plurality of layers or plies, one of said strips being wider than the other, whereby its projecting edges may be turned over upon and to inclose the plies formed by the narrower strip, substantially as described. 95 100

7. The herein described method of making wheel rims, which consists in winding a wide and a narrow portion of fabric successively to form an annular blank; cementing contacting faces of adjacent layers or plies; compressing and shaping the blank, and finally turning the projecting edges of the wider portion over upon and securing them to the narrow plies, substantially as described. 105 110

8. The herein described method of making wheel rims, which consists in winding a strip of paper upon itself to form a ring; winding thereupon a narrower portion of paper to form a plurality of layers or plies; cementing the plies together; subjecting the blank to pressure to shape it; and finally turning over the projecting edges of the wide portion upon the inner narrower plies, substantially as described. 115 120

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES F. COWDREY.

Witnesses:

J. L. GAMMELL,  
CHAS. L. TENNEY.