Oct. 28, 1924. 1,513,204

F. C. WHITE

INSIDE TIRE CORD PATCH

Filed March 8, 1923

Fig. 1.

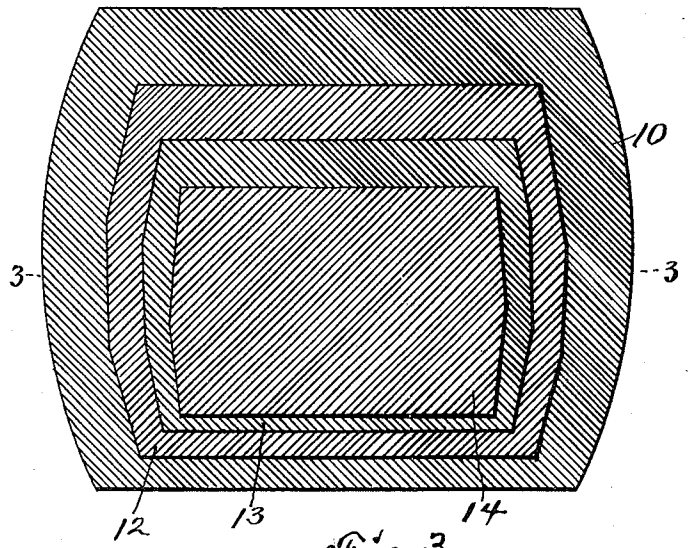


Fig. 2.

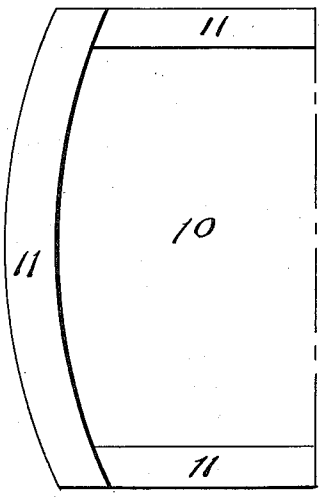


Fig. 3.

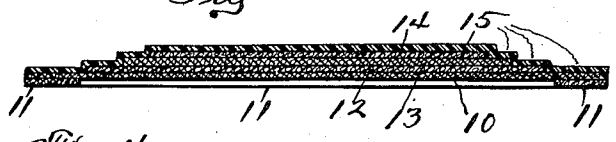


Fig. 4.

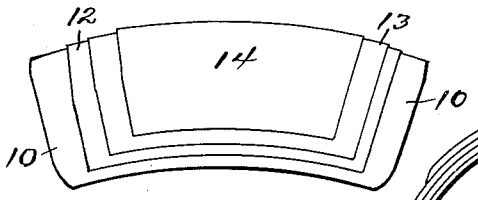
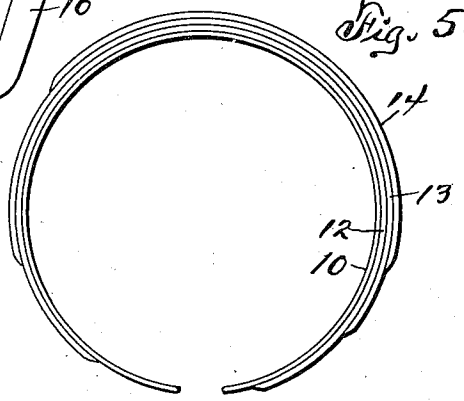


Fig. 5.



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UNITED STATES PATENT OFFICE.

FRED C. WHITE, OF MASON CITY, IOWA.

INSIDE-TIRE CORD PATCH.

Application filed March 8, 1923. Serial No. 623,637.

To all whom it may concern:

Be it known that I, FRED C. WHITE, a citizen of the United States of America, and resident of Mason City, Cerro Gordo County, Iowa, have invented a new and useful Inside-Tire Cord Patch, of which the following is a specification.

An object of this invention is to provide a cord patch adapted to be mounted on the inner surface of a damaged casing of a pneumatic tire and cover the damaged portion thereof.

A further object of this invention is to provide improved means for covering the damaged portion of a cord casing.

A further object of this invention is to provide improved means for covering a damaged portion in the side or quarter of a cord casing.

A further object of this invention is to provide an improved method of making an inside tire patch.

My invention consists in the construction and method of making an inside tire cord patch as hereinafter set forth, pointed out in the claims and illustrated by the accompanying drawing, in which—

Figure 1 is a diagram of my improved patch extended, at one step in the making thereof. Figure 2 is an opposite face view of a portion of the device shown in diagram in Figure 1. Figure 3 is a longitudinal section (flattened) on the indicated line 3—3 of Figure 1. Figure 4 is a side elevation of the complete patch molded to desired form. Figure 5 is an end elevation of the same on an enlarged scale.

In carrying out my improved method I construct a patch as follows: Certain pieces of graduated sizes and generally rectangular form are cut, on the bias, from a sheet of impregnated cord fabric. This cord fabric is a common article of commerce and consists of parallel cords laid in intimate relation and saturated, connected and covered by gum. The largest of the several pieces of cord fabric 10 may be considered as the base or foundation of the patch and is overlaid at the margins of one face (Fig. 2) by strips 11 of plain woven fabric and, ultimately, such overlaid face and said strips are painted or coated with talc to minimize its adhesiveness to any object, such as an inner tube, in contact therewith. The opposite face of the piece 10 is unaltered temporarily. The next smaller piece 12 of cord fabric is laid on the natural face of the piece 10 closer to one side margin thereof than the other and with the cords of the respective pieces crossing substantially at right angles and said pieces are impressioned together by rolling a suitable tool thereon. The next smaller piece 13 of cord fabric is laid on the exposed natural face of the piece 12, the cords of the piece 13 crossing the cords of the piece 12 substantially at right angles, and said pieces 12, 13 are impressioned together by rolling a suitable tool thereon. The piece 13 is so laid as to expose a greater side portion of the piece 12 adjacent to the similar exhibition of the piece 10 relative to the piece 12. The next smaller piece 14 of cord fabric is laid on the exposed natural face of the piece 13, the cords of the piece 14 crossing the cords of the piece 13 substantially at right angles, in such manner as to expose a greater side portion of the piece 13 adjacent to the similar exhibition of the piece 10 relative to the piece 12, and said pieces are impressioned together by rolling a suitable tool thereon. Thus the centers of the pieces 12, 13 and 14 are progressively located greater distances from and on one side of the median line of the piece 10, thus locating the full thickness of the completed patch off-center. The exposed natural faces of the pieces 10, 12, 13 and 14 are then supplied with a natural coat of gum 15. The patch thus formed is molded, preferably on a heated metal form, to conform to the inner surface of an arcuate section of a pneumatic casing and during the operation of molding the gum content and coating may be partially vulcanized. Thus the patch is concaved longitudinally as to the circumference of a casing and is concaved transversely as to the transverse curvature of said casing, and the patches are made in different sizes related to different casings so that the width of the piece 10 will approximate to the width of the inner face of a casing in which it is to be used.

In the completed patch the smallest piece 14 is outermost in respect of the convexity of the patch. In use the completed patch is employed within and to cover a break, roughness or damaged portion of a casing and is placed so that the thickest portion of the patch bridges or extends across the break or damaged portion. As a considerable number of such breaks or damaged portions

occur in the sides or quarters of casings, as distinguished from the treads, special advantage is found in the off-center arrangement of the plies or layers of the patch presenting the thickest portion of the patch coincident with the area of the piece 14 at one side and adapted to overlay such side or lateral break, at the same time permitting the side margins of the piece 10 to register substantially with or be trimmed selectively to the side margins of the casing. Diagonal lines are used in Figure 1 to indicate the trend of the cords in the several pieces of impregnated cord fabric. The pieces are arranged with the cords crossing substantially at right angles so that when the pieces are impressioned together the whole will be strengthened as to tensile strain in any direction. The marginal strips 11 tend to prevent separation of the ends of the cords in the exposed marginal portions of the piece 10. This patch preferably is to be used by repair men to be vulcanized into a cord casing for a permanent vulcanized repair. Patches of this type may be made for each and every size of pneumatic cord casing in use. The one illustrated with four plies is adapted for the smaller sizes of casings and the number of plies and dimensions thereof would be increased for the larger sizes of casings, said larger sizes of casings requiring larger and stronger patches. The molded patch may be reversed for selective use on opposite sides of a casing, dependent on the location of the break or damage laterally of the median line of the tread of said casing.

I claim as my invention—

1. An inside tire cord patch comprising a plurality of sheets of impregnated cord fabric cut on the bias and of graduated sizes, said sheets being superimposed and joined progressively, said sheets being so arranged in order from the larger to the smaller that their centers progressively are located greater distances from and on one side of the median line of the larger sheet, said superimposed and joined sheets being molded into the shape of the interior surface of an arcuate section of a pneumatic tire casing and a gum coating on the convex surface of the assembled sheets.

2. An inside tire cord patch comprising a plurality of pieces of impregnated cord fabric cut on the bias and of graduated sizes, said pieces being superimposed off-center and joined progressively, the cords of each piece crossing the cords of any adjacent piece substantially at right angles, said superimposed and connected pieces being concaved longitudinally and transversely, and a coating of gum applied to the convex surface of the assembled pieces.

3. An inside tire cord patch made of impregnated superimposed connected bias-cut pieces of cord fabric, each piece being arranged off-center relative to the adjacent piece, a coating of gum applied to one face and marginally-arranged strips of woven fabric applied and secured to the opposite face.

4. The method of making an inside tire cord patch, which consists of first forming pieces of graduated sizes from a sheet of impregnated cord fabric by bias cutting, assembling said pieces successively as to size face to face so that the cords of one piece cross the cords of any adjacent piece substantially at right angles, and in such manner that the center of each piece is displaced relative to the center of the piece on which it is mounted impressioning said pieces together successively, molding the assembled pieces under heat, applying a coating of gum to the convex face of the assembled pieces, applying marginal strips of woven fabric to the opposite face of the innermost piece, and applying a non-adhesive coating to said strips and the adjacent face of said innermost piece.

Signed at Mason City, in the county of Cerro Gordo and State of Iowa, this 21st day of November, 1922.

FRED C. WHITE.