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PACKAGING TORIC ARTICLES

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Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

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This invention relates to packages and designs to provide a method for fitting an article with a covering of wrapping material closely conforming thereto. It is applicable to those articles having a longer outer dimension and a shorter inner dimension, which may be referred to as toric, that word denoting a solid which may be considered as produced by the revolution of a figure about an axis exterior thereto. Examples of such articles are coils of wire and the tires of vehicle tires, in which case the revolution is a complete one and the article is annular.

My invention may be understood by the following description of an embodiment thereof taken in connection with the accompanying drawings wherein:

Fig. 1 is a side elevation of a pneumatic vehicle tire enclosed in a wrapping illustrative of my invention.

Fig. 2 is a diagramatic perspective view of a portion of the wrapped tire with a part broken away.

Fig. 3 is a plan view of a portion of the wrapping material preferably used; and

Fig. 4 is a plan view of a portion of wrapping material which may be employed instead of that illustrated in Fig. 3.

As I anticipate a major field of usefulness for my invention in packaging the shoes of pneumatic vehicle tires and have illustrated such a shoe or tire in the drawing, I shall for convenience in the following description refer specifically to a tire as the article enclosed.

In wrapping a tire or other ring-shaped body difficulties are encountered in making a smooth fitting wrapping because distances measured along various parts of the tire are markedly different as contrasted with an article of block-like form, the surface of which consists of a number of planes which can be fitted with a sheet of wrapping material such as paper by a simple folding or bending of the same. In accordance with my present invention, therefore, I utilize wrapping material capable of expansion in localized areas or zones thereof to permit it to be shaped to the tire. Referring to Fig. 3, I have there shown a material suitable for the purpose consisting of one or more thicknesses of heavy paper suitably prepared to provide for local extensibility. This is most conveniently effected through a cramping process providing irregular resilient embossments throughout the area of the paper. The various gatherings or crapes may be stretched out, moreover, against their natural resiliency without substantially affecting the craping or gatherings of adjacent areas and the wrapping material thus changed from its normally flat shape.

In accordance with my invention I utilize bands or strips of material such as described, preferably provided with transverse craping which extends throughout the entire area thereof as indicated in Fig. 3, the entire strip being expansible and no part thereof being restrained either by itself unprovided with stretchable embossments, or because it is restrained by any added element. This is essential to permit the strips of varying form and size to be successfully wrapped. Such strips may be applied circumferentially of the tire, or similar ring-shaped article, and the craping differentially expanded in different longitudinal zones to fit the material smoothly and closely to the cross sectional contour of the article.

Referring to Figs. 1 and 2, in accordance with the preferred form of the invention herein illustrated and specifically claimed, I provide a strip 9 of craped or similarly prepared material which has a considerable range of extensibility and is of sufficient width to encircle the cross section of the tire and present its edges in opposition to be connected thereabout. Such a band may be wrapped circumferentially about the tread or outer circumference of the tire, preferably being located substantially centrally therealong, the central portion of the strip 9 is expanded relatively to the side edges, and the band as a whole assumes a cup-like or channel form which permits it to fit over and conform to the double curvature of the tire and closely fit the same although the circumference thereof measured along the tread at a in Fig. 2 is markedly greater than the circumference measured along the line b or the line c. The expansion is at a maximum along the tread of the tire at the line a, less at the line b, and still less at the line c, the extension being sufficient in each longitudinal zone to permit the wrapping to fit the enclosed article. The strip extends over the sides of the tire to the inner circumference thereof at the beads, and the edges may be folded inwardly across
the beads and there connected. In the present instance I have shown one edge of the strip as overlapping on the other at 11 and secured thereto by adhesive. The strip 9 is preferably made of such length as to completely encircle the tire and the ends of the strip may be joined together as indicated at 13 in Fig. 1.

In Fig. 2 I have attempted to indicate the differential expansion of the strip, but it will be understood that the disclosure is diagrammatic and in particular that the form and size of the embossments 5 are conventionalized and exaggerated.

I wish to emphasize that the wrapping strip 9 is of substantially uniform character throughout and is stretchable or resilient throughout its area. On a large tire, for example, the difference in length between the homologous circumferences in a smaller tire and in articles of varying size and shape the conditions met with are constantly varying.

Thus if the wrapping material were fixed in some dimension, it is possible that it would be adapted for a given purpose if the expansibility of the remaining portion were exactly determined but if the same material were then applied to an article of different size or shape it could not be made to conform thereto. Within a wide range determined by the initial expansibility of the material unrestrained gatherings throughout the area thereof permit the same strip to be adapted to articles of different size or different shape as each portion may expand differentially in order to adapt the material to the article which is to be enclosed. Thus if the craping process were carried on so that the paper could be stretched out to twice its length, and considering strips such as 9 in Fig. 2, provision would be made for covering an article in which the circumference at the tread is twice the circumference at the beads, and this would be effected without stretching the edge of the strip. For this expansion and for any intermediate case in which the center line of the paper would be less extended would correspond certain definite curvatures of the strip. Since the strip, however, is expansible throughout its area, the edges also could be expanded to permit the strip to be fitted to an article having the same maximum circumference but a different curvature.

The material employed may be so craped or gathered as to be expansible laterally as well as in a direction circumferentially of the tire. Such material is conventionally illustrated in Fig. 4 and may have crappings 5 and gatherings herein shown as corrugations 5', extending at right angles thereto.

In my copending application Serial No. 456,407, filed March 28, 1921, of which this application is a division, I have illustrated and specifically claim a toric article wrapped with two strips circumferentially applied, neither strip enclosing the whole or substantially the whole cross section of the tire. In the present application I present generic claims and claims directed specifically to the form herein illustrated wherein a single strip is applied about the exterior circumference of the article, the tread of the tire, and encircles the cross section thereof.

Having thus described the form of my invention shown by way of example in the accompanying drawings, what I claim as new and desire to secure by Letters Patent I shall express in the following claims:

1. The method of packaging toric articles which comprises applying a strip of wrapping material capable of substantially unrestrained longitudinal expansion throughout its width along a circumference of the article, differentially expanding the strip to fit it to and around the article to cover at least a large portion of its cross-sectional perimeter and securing it in position thereabout.

2. The method of packaging toric articles which comprises applying around the outer circumference of the article a strip of wrapping material capable of substantially unrestrained local longitudinal expansion throughout its width and of a width to extend over the sides of the article toward the inner circumference to encircle the greater portion of its cross section, differentially expanding the strip from a maximum at said outer circumference whereby to fit it to and around the article and securing the same in such position with the edges of the strip opposed adjacent the inner circumference.

3. The method of packaging toric articles which comprises applying along a circumference of the article a strip of wrapping material provided throughout its area with resilient embossments freely extensible longitudinally thereof, differentially expanding embossments to fit the strip to and around the article to cover at least a large portion of its cross-sectional perimeter and securing it in position thereabout.

4. A package comprising a ring-shaped material having a wrapping completely enclosing the same comprising a strip of material freely expansible lengthwise throughout its width and of a width to encircle at least the major portion of the cross section of the article, said strip extending between its edges along the outer circumference of the article and expanded in maximum degree thereof and differentially expanded to fit the article at either side of said outer circumference, said edges being connected in a circumferentially extending joint remote from said outer circumference.

5. A package comprising a ring-shaped...
article having a wrapping completely enclosing the same comprising a strip of material freely expansible lengthwise throughout its width and of a width to enclose the cross section of the article and present its edges in opposition for connection in encircling relation thereabout, said strip being applied circumferentially about the outer circumference of the article and expanded along said circumference and differentially at either side thereof to fit the same, said edges being connected along the inner circumference.

6. A package comprising a ring-shaped article having a wrapping completely enclosing the same of material freely expansible lengthwise throughout its width applied circumferentially to the article and differentially expanded to fit the same and comprising a single piece of a size to cover at least a large portion of the exterior of the article.

7. A sealed package comprising a ring-shaped article having a complete covering of wrapping material comprising a single piece adapted to cover at least a large portion of the article and all portions of which possess the characteristic of extensibility in a circumferential direction.

8. A sealed package comprising a ring-shaped article having a complete covering of wrapping material, all portions of which possess the characteristic of extensibility in a circumferential and in a lateral direction.

9. A package comprising a distortable toric article and a wrapping enclosing the same comprising circumferentially extending material comprising a single piece adapted to cover at least a large portion of the article and provided throughout its entire area with gatherings differentially expanded in a longitudinal direction and thereby conforming throughout its width to the enclosed article.

In testimony whereof, I have signed my name to this specification.

EDWARD H. ANGIER.