Nov. 26, 1929. C. H. DESAUTELS 1,737,110

SECTIONAL REPAIR BAG

Filed March 7, 1927

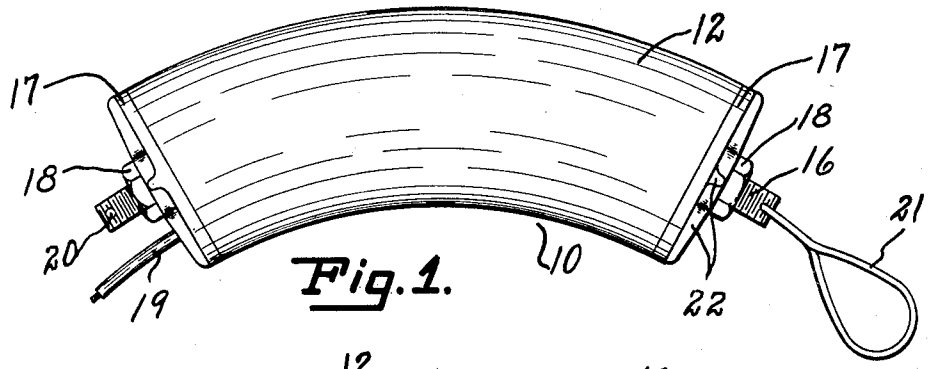


Fig. 1.

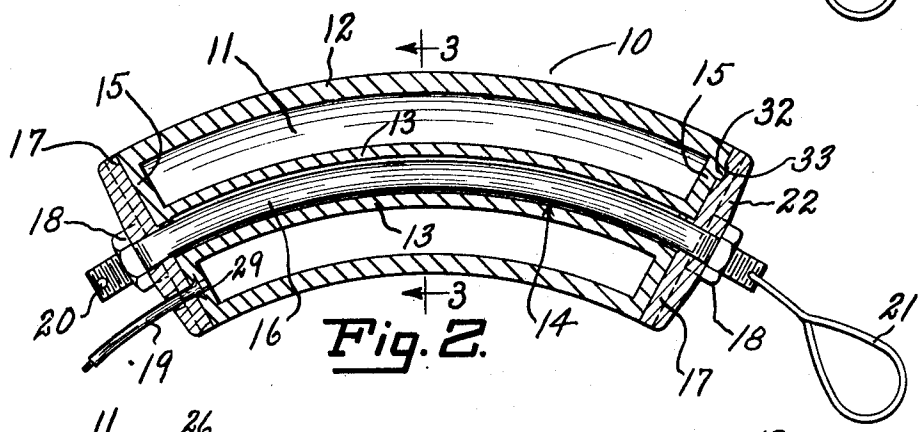


Fig. 2.

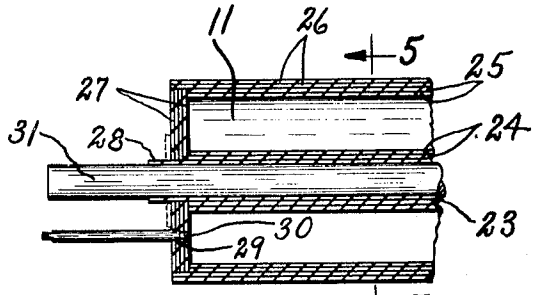


Fig. 4.

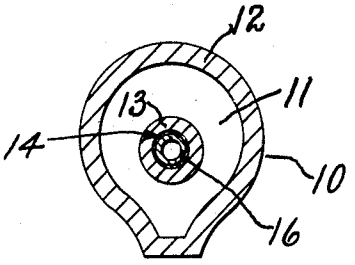


Fig. 3.

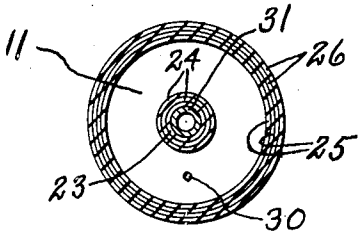


Fig. 5.

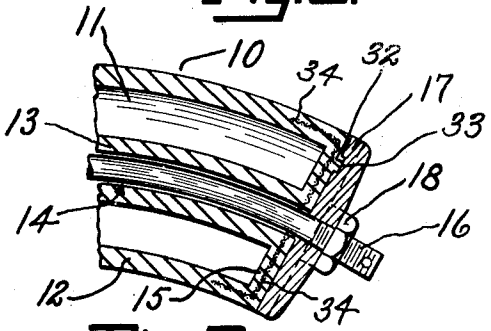


Fig. 6.

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UNITED STATES PATENT OFFICE

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SECTIONAL REPAIR BAG

Application filed March 7, 1927. Serial No. 173,347.

This invention relates to sectional repair bags for use in repairing tire casings. It has for its object the improvement of existing bags of this type in several aspects, particularly with relation to the cheapness of manufacture, effectiveness in use, and simplicity of construction. In accomplishing these general objects I have provided a bag which is of an integral airtight construction although permitting the replacement of its fluid-containing portion. I have furthermore provided a bag which may be composed either entirely or partially of rubber as desired, and which will have sufficient strength to withstand the use to which it is subjected without undue strain or susceptibility to injury.

The invention will now be described with relation to the accompanying drawings, in which

Fig. 1 is a side view of a bag constructed in accordance with my invention;

Fig. 2 is a longitudinal section therethrough;

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

Fig. 4 is a detail showing the bag in the process of construction;

Fig. 5 is a section on line 5—5 of Fig. 4; and

Fig. 6 is a detail showing a modification.

My improved bag is composed of a body portion 10 preferably formed entirely, or at least for the greater part, of rubber. In this body portion is formed an annular chamber 11 bounded between outer walls 12 and inner walls 13. The inner walls 13 also form the boundary of a hole 14 extending longitudinally all the way through the bag. The inner and outer walls are joined by end walls 15. It will be seen that the bag is thus constructed with a complete integral and unitary air containing chamber wholly without the use of any sealing means or clamping devices for making an air tight joint. This feature is of great importance in insuring the reliability of the bag in use.

Passing through the hole 14 is a rod 16 preferably curved so as to impart to the bag the same curvature as that of the casing in which it is to be used. At the ends of the bag are abutment plates 17 which are secured to the rod 16 by the nuts 18 threaded onto the ends of the rod. A valve 19 passes through one of the abutment plates and into the annular chamber 11 to permit the introduction into this chamber of fluid under pressure and thereby inflate the bag to exert an expanding force upon the casing to be vulcanized. At the end of rod 16 are holes 20 which may serve for the reception of a handle 21 conveniently formed of wire. If desired ribs 22 may be formed on the plates 17 in order to give additional strength and to enhance the appearance.

The building of the bag will now be described, it being understood, however, that the steps set forth are illustrative only, and that the bag may be built by any one of several methods which will readily occur to the skilled rubber worker. A tubular ply 23 is first formed and surmounted by additional plies 24 which form the inner walls 13 of the bag. The ply 23 is taken of greater length than the plies 24 for a reason which will appear. Tubular plies 25 and 26 are then formed with the plies 26 of a greater length than the plies 25. These plies conjointly form the outer walls 12 of the bag. The end walls are laminated to the desired thickness from circular pieces of rubber 27. These pieces are slipped over the ply 23 and under the plies 26, abutting against the end of plies 24 and 25. The ends 28 of ply 23 are now folded back against the outer surface of the end walls as indicated by dotted lines in Fig. 4. The valve 19 is preferably built into the laminations 27 before these are placed in the bag, a head 29 on the valve being embedded between certain of the laminations 27 and a hole 30 being formed through these laminations to afford access from the valve to the interior of the chamber 11.

Conveniently, the building up of the bag takes place upon a straight mandrel 31, which for building purposes takes the place of rod 16. Instead of building the bag in the curved shape which it is later to assume, it is preferable to build it straight and to distort it into curved form before vulcanization. When the bag is completely built up and is ready for vulcanization the mandrel 31 is removed and its place taken by the rod 16 or by a

curved mandrel which is of substantially the same shape and dimensions as this rod. The bag is then subjected to heat in a mold of the usual form used for curing sectional repair bags, with fluid pressure introduced into the chamber 11 through the valve 19. After the bag is removed from the mold the plates 17 are applied and held in position by nuts 18, thus finishing the bag ready for use.

In use it will be found that the walls 12 of the bag are extremely free to expand under the influence of internal pressure and that by the use of this bag an exceptionally even pressure is obtained under the tire casing being vulcanized. It is well known that rubber deteriorates rapidly when subjected to repeated heating, and the rubber component of this bag will gradually become hard and brittle after it has been used in the repairing of a considerable number of tire casings. When this occurs it is only necessary to remove the nuts 18 and the flanges 17, when the rod 16 can be pulled completely out of the bag and a new rubber portion substituted. No difficulty, however, will be experienced in making an air tight joint when this second rubber portion is put into place, as has been the case with prior bags having removable parts, for the reason that the chamber 11 is completely enclosed by rubber walls and the plates 17 and rod 16 perform no function in sealing the chamber 11 against leakage of air.

In order to hold the plates 17 against rotation it is preferable to mold a boss 32 on one of the end walls 15, this boss fitting into a recess 33 in one of the plates 17. The valve stem 19 performs a similar function for the other end of the plates. In case it may be found that a bag constructed as described gives too much expansion near the end of the bag, expansion may be restricted by building a re-enforcement of fabric 34 into the end walls and a portion of the outer walls 12 of the bag as shown in Fig. 6.

Having thus described my invention, I claim:

1. A sectional repair bag having an arc-shaped body portion with a hole extending through it from end to end, a fluid tight annular chamber surmounting the hole and completely contained in the body portion, a non-extensible member passing through the hole in the body portion, abutments secured to each end of the member serving to prevent longitudinal expansion of the bag, and means for introducing fluid pressure into said chamber.

2. A sectional arc-shaped repair bag having an integral air tight expansible portion composed intermediate its ends entirely of rubber, and means separable from said portion for restricting longitudinal expansion only of the bag.

3. A sectional repair bag having an inherently expansible arc-shaped body portion formed with integral walls defining a central hole from end to end of the body portion and an air-tight annular chamber, and means passing through the hole and operating on the ends of the body portion to restrict longitudinal expansion thereof.

4. A sectional repair bag having an arc-shaped integral air tight portion normally expansible in all directions and means separable from said portion restricting expansion of the bag in a longitudinal direction only.

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