F. A. SCHWARTZ.

MOLD FOR PNEUMATIC TIRE TUBES.

APPLICATION FILED FEB. 10, 1921.

1,388,382. Patented Aug. 23, 1921.

Fig. 3

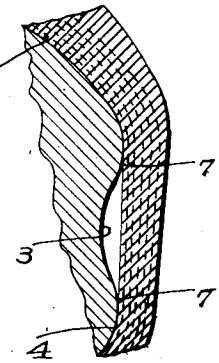


Fig. 2

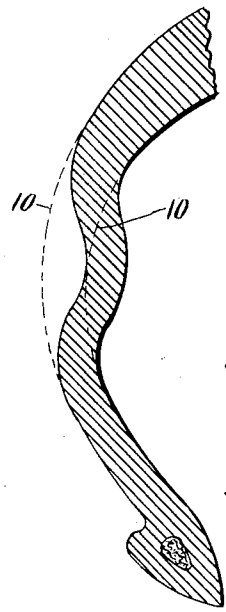
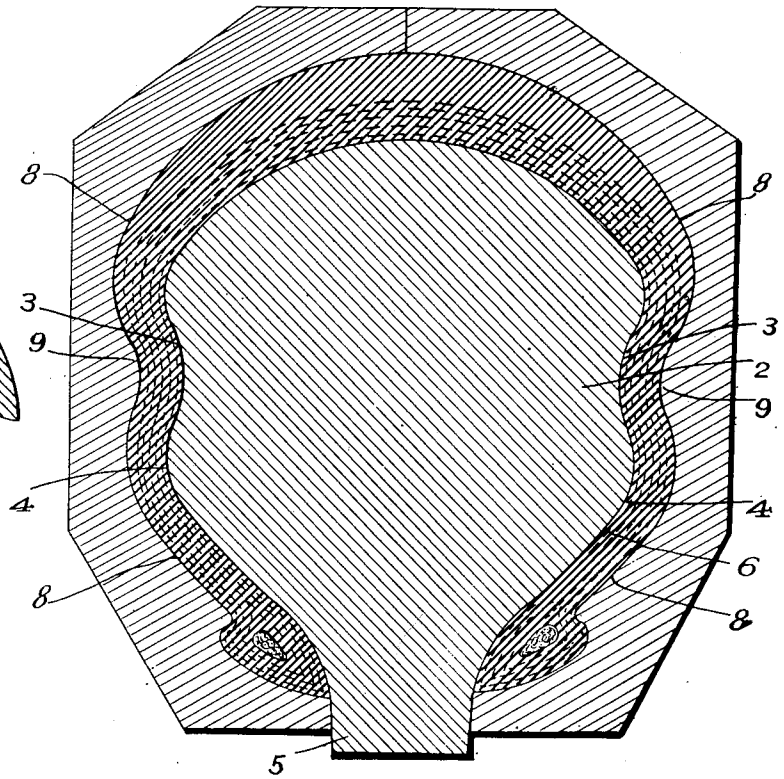


Fig. 1



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MOLD FOR PNEUMATIC-TIRE TUBES.

REISSUED

1,388,382. Specification of Letters Patent. Patented Aug. 23, 1921.

Application filed February 10, 1921. Serial No. 443,917.

To all whom it may concern:

Be it known that I, FRED A. SCHWARTZ, a citizen of the United States of America, residing in the city of Brooklyn and State of New York, have invented new and useful Improvements in Molds for Pneumatic-Tire Tubes, of which the following specification is an exact and true description, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention relates to the construction and vulcanization of casings that are used in combination with pneumatic tubes, the said combination being usually referred to as the pneumatic tire.

The object of the invention is to provide means to correct certain faulty conditions that obtain with ordinary methods of constructing and vulcanizing casings.

In the process of vulcanizing casings it has been demonstrated that better results are obtainable when the fabric structure of the casing is subjected to pressure that is applied in the direction of the radii of the casing simultaneously with pressure that impulses the companion casing forming mold parts.

To this end various means are being employed, as for example, the casing to be vulcanized is removed from the rigid core upon which it is constructed and there is substituted an elastic core by which means the casing is during the process of vulcanization subjected to an expanding pressure that is admitted to within the elastic core.

With my invention in use, similar results are obtained, and without the expense of renewing at frequent intervals the elastic cores, and with a considerable saving in time and labor consumed in bolting or clamping companion casing forming mold parts against the internal pressure.

As will be made plainly evident in this specification, by reason of the novel conformation of the surface area of the improved core, and grooves of the companion casing forming mold parts, the fabric or cord structure of the casing during the process of vulcanization, is, by the use of my invention subjected to stress that is applied to the fabric or cord structure in the direction of the plane of the side walls of the casing simultaneously to the compressing action of the casing forming mold parts.

In the accompanying drawings which form a part of this specification, Figure 1 is a cross section of the vulcanized casing in association with a cross section of the improved equipment; the core and companion casing forming mold parts which comprise the improved equipment being in their relative operative position as assumed during the final stage of the process of vulcanization of the casing.

Fig. 2 is a fragmentary cross section of the vulcanized casing, illustrating by broken lines the conformation as assumed by the side walls of the casing when in use.

Fig. 3 is a view similar to Fig. 2, illustrating the method of building or mounting the unvulcanized casing upon the core.

The improved equipment may be employed in the construction and vulcanization of casings of the clencher, or straight side type, and the core forming a part of the improved equipment may be rigid, or collapsible, and while the equipment is more particularly intended for use in the construction and vulcanization of casings of the cord ply construction, by the use of my improved equipment casings of superior quality may be produced in the woven fabric ply construction.

The function of the improved equipment is positively reliable, and results from the novel method of building or mounting the casing upon the core, and by the conformation given the side walls of the casing during the process of vulcanization.

The method of building, or constructing the casing upon the improved core is substantially the same as when employing the ordinary equipment; that is the body of the casing consists of several layers, or plies of rubberized fabric or cord, and upon which structure the outer elements of the casing, as the tread, beads, and side walls of rubber compounds, are secured by vulcanization.

Referring to Fig. 1, and to the core 2, which may be constructed by any preferred method, as for example it may be cast solid, or hollow, or it may be constructed of pressed metal parts. It will be noted that the surface of the core is provided with circumferentially directed grooves, as indi-

cated by the numerals 3, 3; it will be also noted that these grooves are positioned at substantially the central circumferential line between the inner and outer peripheries of the core, and that the conjunction of the concave and convex areas are effected by regular, but shorter curved areas, the importance of which will be later apparent.

When building the casing upon the improved core the surface area of the core between the inner edges 4, 4, of the grooves and the inwardly directed flange 5, is given a covering of rubber cement; the first ply 6, of fabric or cord is placed upon the core and "stitched," that is the ply is caused to conform to the surface area of the core, and the edges are secured to the core by the adhesive qualities of the rubber cement. As will be observed by referring to the numerals 7, 7, Fig. 3, the fabric or cord structure of casing is not caused to conform to the surface area of the grooves; the result is that when the casing is finally completed by the casing builder, there is space between the surface area of the grooves 3, 3, and the inner surface of the unvulcanized casing.

The operation of the improved equipment when the casing is to be vulcanized is as follows: referring to the casing forming mold parts, and to the annular casing forming grooves 8, 8, Fig. 1, it will be observed that the circumferentially directed ribs 9, 9, that are off-set from the inner or mold sides of the annular casing forming grooves 8, 8, aline with, and with the casing forming mold parts in closed position engage the grooves 3, 3, which are circumferentially directed upon the surface of the core. (It is understood that proper clearance is provided for the casing between the ribs and grooves when the mold parts are in closed position.)

By the means just described, the side walls of the casing are during the process of vulcanization caused to conform to the surface area of the annular grooves in the core, and the annular ribs off-set from the curved surface area of the casing forming grooves. Thus the surplus fabric or cord stock, that results from the closing action of the mold parts compressing the several fabric plies is taken up by the surface area of the core that is provided by the grooves.

The vulcanized casing is removed from the casing forming mold parts and stripped from the core in the usual manner. The vulcanized, but not inflated casing is of the same conformation as the surface area of the casing forming grooves in the companion mold parts in which the casing has been vulcanized, but by reason of the pressure exerted upon the side walls of the casing by the inflated inner air tube, the casing when in service will assume the regular curved conformation as indicated by the broken lines 10, 10, Fig. 2.

It may be remarked that the forcing of the side walls of the casing to the regular curved surface conformation will effect a compressing pressure in the direction of the plane of the side walls of the casing, the result of which will effect a thickening of the rubber compound covering the fabric structure of the casing. Thus the flexing, and reflexing action of the casing when in use will be much better withstood by the rubber compound projecting into the fabric structure of the casing at this most vulnerable point.

Having thus described my invention without having attempted to set forth all the modes of its use, I declare that what I claim and desire to secure by Letters Patent is:—

A casing mold comprising a pair of complementary annular sections each having an annular rib offset from its annular concave molding surface, and an annular core element having a molding surface normally extending between the said complementary annular sections, the said annular core element having grooves opposite the said annular ribs.

In testimony whereof, I affix my signature.

FRED A. SCHWARTZ.

Witnesses:
W. A. CONLEY,
JOHN R. STALEY.