

Segmental tire mould

A segmental mould mechanism for curing a pneumatic tire is described and includes two opposed sidewall moulding sections, a plurality of radially movable tread moulding segments mounted between said sections and means for effecting radially inward and outward movement of the tread moulding segments upon movement of the sidewall mould sections towards and away from one another. The mechanism includes a unique "floating" segment mounting arrangement whereby sliding contact between the segments and the bearing surface on which they are mounted for radially inward and outward movement is minimized. More specifically, the segment mounting arrangement is adapted to permit limited axial movement of the segments away from the bearing surface on which they are mounted under the influence of resilient biasing means interspaced between the adjacent surfaces of the segments and the bearing surface thereby preventing direct contact between these surfaces until the segments are pressed towards the bearing surface with sufficient force to overcome the force of the resilient biasing means. In a preferred form, the segment mounting is also adapted to permit limited pivotal movement of the segments about axes substantially parallel to the axes of sidewall moulding sections. This feature, together with the "floating" quality of the segments, serves to facilitate the release of the mould segments from the tire tread after curing and to minimize binding or jamming of the segments during their inward and outward radial movement.

It is a further object of the invention to provide a segment mounting arrangement which eliminates, or at least substantially decreases, the tendency for the segments to bind or jam during radial movement between their open or tire loading position and their closed or tire moulding position.

Another object of the invention is to provide a segmental mould mechanism which is readily adaptable for use in conventional curing presses which normally utilize upper and lower mould halves, each of which includes half of the sidewall and tread moulding portion of the mould.

A still further object of the invention is to provide a segmental tire mould which is exceptionally compact and is relatively inexpensive to manufacture, install and operate.

Another object of the invention is to provide a segment mounting arrangement which is particularly suitable for mounting the radially movable segments on a segmental tire mould of the type which includes opposed sidewall moulding sections adapted for axial displacement relative to one another, a plurality of tread moulding segments in an annulus between said sidewall sections and resilient biasing means positioned radially inwardly of said segments and operative to urge said segments radially outwardly. I

In accordance with the invention, there is provided a mould mechanism having a segment mounting arrangement which secures the segments to a support surface in such manner that the segments are resiliently biased away from the support surface so as to float in relation thereto unless the segments are pressed towards the support surface with a force greater than that biasing them away therefrom. This arrangement, coupled with any suitably controlled actuating means for moving the segments radially inward and outward as well as axially towards

the segment support surface, enables operation of the mould mechanism with minimum sliding contact between the segments and the support surface during the radial inward and outward movement of the segments. That is, by controlling the force exerted on the segments towards the support surface in relation to the force biasing them away therefrom, the segments can be allowed to float in relation to the segment support surface until they are at or near their radially innermost or moulding positions.

More specifically, in its preferred form, the mould mechanism provided in accordance with the invention includes two opposed sidewall moulding sections axially relatively movable towards and away from each other; a plurality of tread moulding segments disposed between said sections, a bearing surface for said segments extending radially outwardly with respect to one of said sections; mounting means for said segments per se of the force of said resilient means; and means for effecting movement of said segments radially inwardly and outwardly as well as axially towards said bearing surface in co-ordination with the axial movement of said sidewall sections towards and away from each other.

In another preferred modification of the invention the segment mounting arrangement is adapted to permit, in addition to the limited axial movement just described, limited pivotal movement of the segments about axes substantially parallel to the axis of the sidewall moulding sections.

The segment mounting arrangement of the mould mechanism of the invention functions, firstly, to minimize sliding contact between the adjacent surfaces of the mould segments and the support surface on which they are mounted thereby preventing these surfaces from becoming worn from the repeated in-and-out movement of the segments in the operation of the mould. Secondly, it serves to eliminate any binding tendency during the inward and outward radial movement of the segments. More importantly, it facilitates the separation of the tread moulding face from the cured tire tread since there need not be simultaneous separation of the total tread face from the total tire tread surface with which it is in contact. One portion of the tread mould face can separate before another portion,

- thus providing a type of peeling" action. This feature,

in turn, permits the use of inexpensive, compact and efficient resilient biasing means for effecting radially outward movement of the segments rather than the elaborate levers, cams, gears and other bulky contrivances of prior art segmental mould mechanisms.

DESCRIPTION OF THE DRAWINGS These and other features of the invention will become apparent from the following description of the parts, principles and elements thereof given herein by way of example, with reference to the accompanying drawings wherein like reference numbers refer to like parts throughout the several views and wherein:

FIG. 1 is a side elevation view, partially in section of a segmental mould apparatus constructed in accordance with the