

- [54] **CONTINUOUSLY VARIABLE CONTACT LENS**
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- [58] **Field of Search** 51/284 R, 324; 351/160 R, 160 H, 161, 162, 176, 177

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[57] **ABSTRACT**

A continuously variable multi-focal soft contact lens wherein a continuous optical gradient in a region smaller than the maximum pupil opening is provided. The concave surface is aspheric with a desired optical power for distant viewing at the center which increases to the desired near vision power. The increase is usually about 3 to 5 diopters within 6 mm of the anterior optical zone (AOZ) which is approximately 9.7 mm in diameter when wet. Outside this 6 mm zone the concave surface is essentially spherical. The concave surface is an aspheric curve having a steeper curve in the middle than a base curve r_2 . The curve at the center is the steepest and is designated as r_2' . Once r_2 and r_2' curves are determined, the thickness of the lens (t) and the radius of curavation for AOZ designated r_1 is calculated using the desired optical power at the apex of the lens (P_w) and desired thickness at the junction (JTK) of the AOZ, based on the following equation:

$$P_w = \frac{1}{\frac{r_1 \times \text{Exp}}{n-1} - \frac{t \times \text{Exp}}{n}} - \frac{n-1}{r_2' \times \text{Exp}}$$

wherein Exp is the expansion factor and n is the index of refraction of the lens when wet, all other dimension in the dry state, before expansion. The lenses may be manufactured by lathe cut and polish means using the squeeze method or may be duplicated by molding and casting.

35 Claims, 8 Drawing Figures

