

[54] **OPHTHALMIC LENS FOR PRESBYOPIA AND APHAKIA**

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Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 322,488, Jan. 10, 1973, abandoned.

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[51] Int. Cl.² **G02C 7/06**

[58] Field of Search **351/169, 167, 161, 177**

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UNITED STATES PATENTS

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[57] **ABSTRACT**

There is presented a multifocal ophthalmic lens of homogeneous transparent optical material useful for the correction of the refractive error and the accommodative insufficiency or absence of accommodation in presbyopia and in aphakia, the lens characterized by

having a unique variable front surface, and a coating conicoid surface of eccentricity zero or greater, or toric, back surface, said variable front surface characterized by being geometrically and optically regular and continuous and having a pair of intersecting orthogonal principal planes, the first of said planes, generally horizontal, intersecting said variable surface normally at all points in a circular or elliptical or substantially elliptical great arc, the derivative of curvature vanishing at said great arc in sections orthogonal to it; the second of said planes, generally vertical, intersecting said variable surface normally at all points in a principal curve, about which there is symmetry, at least the portion of said principal curve below said great arc increasing in curvature progressively, said orthogonal principal planes intersecting along the axis of said variable surface, said axis intersecting said variable surface normally at an axial umbilical point where the derivative of curvature vanishes, all transverse sections of said surface at least below said great arc by planes orthogonal to said principal curve being conics of eccentricity greater than zero, or slight modifications thereof, the axes of all of said conics intersecting normally said principal curve, and the apical curvatures of said conic transverse sections at said principal curve being substantially equal to and increasing at an accelerated rate substantially equal to the corresponding curvature and rates of change respectively along said principal curve, while the corresponding eccentricities of said conic transverse sections also increase.

11 Claims, 23 Drawing Figures

