

ate a pore diameter of 100 Angstroms. A refractive index of 1.366 is arbitrarily chosen and will require a solution of 20% amylopectin. A wide and generous optical zone of 7.0 mm is selected. The lens is designed to be fitted to a cornea so that its posterior radius will conform, for example, an average 7.8 mm radius of the cornea. Given these parameters, an anterior curvature of the lens of 6.0 mm radius will occur and result in an extremely favorable thin lens having a central maximum thickness of the lens of 0.3 mm. The volume of the lens will be 6.19 cu mm and thus 1.5 mg of amylopectin will create the desired 20% solution and refractive index of 1.366. The periphery of the lens can be heat-sealed at 225-260 degrees Fahrenheit. If necessary, a posterior scaffolding can be constructed of polymethylmethacrylate, a silicon polymethylmethacrylate polymer, polypropylene or hydrogel and joined to either posterior and/or anterior polymer films by heat impulse, compatible adhesive or the manufacturing process itself when mesh and/or film are in a precast state.

#### EXAMPLE II

A concave lens to correct high myopia, thus gaining "minus" power can be similarly constructed. For example a lens correcting relatively extreme myopia of -10.00 diopters, can be constructed. Assuming a cornea of average radius, 7.8 mm, choosing a refractive index for the lens of 1.366 equalling the index ascertained for a 20% solution of amylopectin, and a large optical zone of 7.0 mm diameter, the required anterior radius of the lens will be 9.9 mm. Given the basic stability and characteristics of this type of lens, it can be constructed with no significant center point thickness except for the thickness of the opposing membranes, thus attaining a maximum vertical height at its lateral thickest portion of 0.19 mm. The volume of this lens is 4.58 cu mm and thus 1.1 mg of amylopectin will be added to the lens cavity. The osmotic pressure generated in the lenses is well below the burst strength of 30 pounds per square inch for a 1 mil film of polyvinylidene chloride.

#### EXAMPLE III

A lens for incorporation within the corneal substance (keratophakia) can be similarly constructed. The following conditions are assumed: an example of aphakic hyperopia; the need to generate a total ocular power from the posterior corneal surface of 60 diopters; an average normal anterior corneal radius of 7.8 mm; and a posterior corneal radius of 6.5 mm. As an extreme example, the lens may be made with a dilute solution of macromolecules such that the refractive index approaches that of water and aqueous humor and tears, namely 1.336, less than that of the cornea itself (1.376). A large optical zone of diameter of 7.0 mm is chosen and a new anterior corneal radius of 5.6 mm is necessary. To achieve this change in corneal configuration, a lenticule, with an anterior radius of 5.35 mm, a posterior radius of 7.55 mm, thus generating a central maximum thickness of 0.4 mm should be fabricated. Obviously, for increasing refractive index, a decreased thickness for any given diameter of optical zone can be achieved by requiring less of a change in the anterior convexity of the cornea. Reduction in corneal convexity, by incorporating minus concave lenses for the correction of myopia, can be similarly accomplished by fashioning such intrastromal lenticules as described for the contact lens. Support scaffolding can be incorporated into the ante-

rior and/or posterior surfaces as needed. The periphery of this particular lens may be impulse sealed after incorporation of less than one-half mg of dextran (less than 5% solution), requiring a peripherally sealed zone of  $\frac{1}{2}$  to 1 mm for a total 8.0 to 9.0 mm diameter lenticule.

#### EXAMPLE IV

An intraocular lens may be constructed in accordance with the invention. Assuming an average intraocular lens power of 20 diopters, a lens symmetrically biconvex, and 33 $\frac{1}{3}$ % solution of dextran or amylopectin with a refractive index of 1.400, a generous optical zone for an intraocular lens of 6.0 mm diameter is chosen, thus requiring a radius anteriorly and posteriorly of 6.4 mm and creating a total thickness at the center maximum of 1.4 mm. The lens will have a volume of 11.92 cu mm and thus require incorporation of 5.9 mg of Dextran or amylopectin. This lens may be constructed so that it has a  $\frac{1}{2}$  mm wide circumferential seal which incorporates thin support haptics enabling the lens in its dehydrated state to be folded or rolled and maneuvered into the eye through an incision 3 $\frac{1}{2}$  to 4 mm long.

It will be understood that the above description of the present invention is susceptible to various modifications, changes and adaptations and the same are intended to be comprehended within the meaning and range of equivalents of the appended claims.

I claim:

1. A lens comprising

a semipermeable transparent sheath having opposite anterior and posterior portions joined at their edges and forming a closed interior space between themselves;

a body of liquid within said sheath and filling said interior space, said body of liquid constituting an optical lens whose anterior and posterior surfaces are bounded by said anterior and posterior portions of said sheath, respectively, thus defining the anterior and posterior surfaces of the lens; and

means in said body of liquid for producing within said interior space a concentration which is greater than the concentration of a liquid medium in association with which the lens is to be used, in consequence of which when said lens is in contact with such medium, the interior space will be kept filled with liquid under the influence of osmosis which causes the flow of liquid from the exterior of the sheath to the interior thereof whenever the interior space is less than full thereby maintaining the shape of the lens.

2. The lens of claim 1 wherein said transparent sheath has a thickness of less than 50 microns.

3. The lens of claim 1 wherein said body of liquid and said medium in association with which the lens is to be used are comprised of a physiological solution.

4. The lens of claim 3 wherein said physiological solution comprises a physiological saline solution.

5. The lens of claim 3 wherein said body of liquid further includes a physiologically active agent.

6. The lens of claim 1 wherein said means for producing within said interior space a concentration which is greater than the concentration of a liquid medium in association with which the lens is to be used comprises a macromolecule.

7. The lens of claim 6 wherein said macromolecule is photostable.

8. The lens of claim 6 wherein said macromolecule is inert.