

convex and the posterior surface 11 is planar and supported by arches 8 from feet 7 as to be clear of the iris, thereby avoiding problems attendant to the irritation resulting from operative procedures during removal of the natural lens and the implant thereof.

Exemplary dimensional parameters of the particular embodiment of the invention described in FIGS. 1 through 5 are:

- diameter of lens 9=6.0 mm.;
- lateral dimension of foot 7=5.0 mm.;
- thickness of lens 9 along the optical axis 14, variable according to the power of the lens;
- thickness of foot 7 perpendicular to the ciliary area=0.25 mm.;
- distance from toe to toe=11.0 mm. to 14.0 mm. in 0.5 mm. steps.

The distance from the transiridial plane to the lens posterior along the optical axis 14 preferably is about  $\frac{1}{4}$  mm.

In FIG. 3, the lens 9 is illustrated as inserted into an eye 41. Posterior chamber 35 is separated from anterior chamber 37 by the iris 32. The iris 32 is comprised of spongy tissue and has a central aperture or pupil 33. The cornea 38 defines the outside boundary of the anterior chamber 37. During surgical implantation of the intra-ocular lens, an incision is made in the cornea 38, and the cornea 38 is carefully lifted away to permit surgical entry into the eye 41. After the natural lens is removed, the lens structure is then positioned in the anterior chamber of the eye anterior to the iris 32.

The intraocular lens 9 functions to provide accommodation by supporting the optical structure anterior to the iris and movably holding the lens in front of the pupillary aperture by means of the supporting structure which extends to the boundary of the anterior chamber and responds to lateral forces on the feet 7 to change the lens-retina spacing. More particularly, if forces are applied in the direction of arrows 7a, FIG. 2, then with the implant totally or partly of soft materials, the lens will be moved in direction 10a thereby changing the optics in the eye. In effect, the lens section is coupled to the feet by a structural hinge which permits change in the angle between the posterior plane of the lens and the structure forming the haptics and feet. The haptics and feet are proportioned and of such material that the haptics may be distorted without distortion of the lens section and such that the position of the lens section may be forced to change. The effect will be to move the image forward, and thus, in a manner which generally corresponds to that of the natural eye, provides for focusing onto the retina of objects at varying distances from the eye. It is noted that the chemistry of PMMA and PHEMA materials is well known. Extensive study of such materials has been undertaken in connection with developments relating to contact lenses. Three manuscripts contained in Montague Ruben's *Soft Contact Lenses*, John Wiley & Sons, 1978, New York, which

extensively treat the subject of the materials here involved are:

1. "The Beginning of the Soft Lens", Otto Wichterle, pp. 3-5.
2. "The Development of pHEMA for Contact Lens Wear", Maximilian Dreifus, pp. 7-15.
3. "The Chemistry of Soft Hydrogel Lens Materials", Miguel F. Refojo, pp. 19-38.

Although particular embodiments of the invention have been illustrated in the drawings and described herein, it will be understood that the invention is not limited to the embodiments disclosed, but is capable of rearrangement, modification and substitution of parts and elements without departing from the spirit of the invention.

I claim:

1. In an eye implant having an optical lens anteriorly convex and posteriorly planar supported on two diametrically opposed coplanar feet through two supporting members forming a substantially continuous arched surface, each supporting member being unitary with said lens and rooted in one of said feet outside the perimeter of said lens and supporting said lens with the posterior thereof anterior to the plane of said feet, the improvement comprising said lens being formed of a rigidly biologically inert material, and said supporting members being formed of soft biologically supporting hydrogel material to provide structure which, when fixed into the eye, moves said lens anteriorly only along the axis of the eye when forces are applied to said feet upon contraction of the ciliary body.

2. The implant of claim 1, said lens being formed of material such as polymethyl methacrylate and said supporting members being formed of material such as PHEMA.

3. An accommodating artificial implant lens to be fixed into an eye which comprises:

- (a) a substantially continuous arched surface structural support of soft biologically inert hydrogel lens material,
- (b) coplanar oppositely directed feet extending from opposite ends of said support, of dimension to extend to the boundary of the anterior chamber of the eye, and shaped to fix the position thereof into the eye, and
- (c) a lens formed in said structural support anteriorly convex and posteriorly shaped for substantial clearance above the plane of said feet and of hard biologically inert lens material and movable only away from the iris of the eye along the axis of the eye upon bending of said support in response to contraction of the ciliary body.

4. The combination set forth in claim 3 in which said structural support is formed of PHEMA compounds and said lens is formed of material such as polymethyl methacrylate.

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