for the right eye. This too, is to facilitate the adaptation process.

FIGS. **11**, **12** and **13** illustrate sectional views through hydrogel lenses having a large number of elements. In a lens, such as hydrogel lens **10**, having the incident rays **140***a*–**140***d* entering the convex side **143**, of a lens **141**, a potential problem arises due to the fact that the incident rays are diffracted inwardly forming diffracted rays **145***a*–**145***d* and may strike portions of the inner wall **146***a*–**146***n* of the concentric elements **148***a*–**148***n* causing an unwanted reflection and distortion. The incident rays which are close to the inner periphery of the annular elements **148***a*–**148***n* will be diffracted in the direction of the junction as shown by the rays **145***c* and **145***d*. The rays **145***a* and **145***b*, which fall further from the inner periphery, will not strike the corresponding wall **146***a*–**146***n*. This situation where incident rays, such as **140***c* and **140***d*, are reflected can lead to annoying ghosting and distortion.

In FIG. **12**, the concentric annular elements **150***a*–**150***n* have walls **152***a*–**152***n* which are angled causing incident rays **154***a*–**154***f* to be diffracted into diffracted rays **156***a*–**156***f* which are essentially parallel to the concentric annular elements **150***a*–**150***n*, thereby reducing the tendency to cause reflections when entering the convex side **158** of the lens **159**. If further reduction in reflections are desired the surface area near the junctions can be masked as previously described.

In FIG. **13**, the incident rays **160***a*–**160***n* strike the plano surface **161** of lens **163**. Since there is very little diffraction at this surface, reflections are largely avoided and diffracted rays **162***a*–**162***n* are diffracted minimally to depart the lens posterior at only a slightly diffracted angle. As in the case with the embodiment of FIG. **12**, reflections can be further reduced by masking the surface area in the region of the junctions between segments.

MODE OF OPERATION

In the case where a defective natural lens is to be replaced, it is customary to make extensive measurements on the eye prior to the removal of the defective natural lens and its replacement with a fixed focus implantable lens. Such measurements allow the selection of a lens having appropriate power for the individual and the nominal distance to the object which is desired to be brought into focus on the retina. This approach to the problem has the disadvantage that a wide range of powers must be available to the surgeon. Since each lens is individually fabricated, the economic burden of fabricating a wide variety of powers adds substantially to the cost of lenses. It would be much cheaper to manufacture only a few lenses and use them in all patients. The cost of manufacture would be reduced and inventory requirements would be much less burdensome.

The use of flexible hydrogel material allows the lens to be folded or rolled up and inserted into the eye through an incision or puncture which is much smaller than required for a conventional, rigid lens. Since the insertion procedure is simplified, the cost of implantation is reduced and the chance for success is enhanced.

Reduction of the cost of the lenses would have the effect of increasing the availability of this procedure to those who currently lack the economic means to afford such an operation. This is particularly the case in third world countries where costs are often the overriding consideration in medical care.

Various modifications can be made to the present invention without departing from the apparent scope herein.

I claim:

1. A zone of focus hydrogel lens for use with an eye comprising:

a. a cylindrical optical hydrogel element;

b. at least one annular optical hydrogel element joined with said cylindrical element to form a unitary lens structure having a front surface, a rear surface and a circular periphery;

c. each of said hydrogel elements serving to create an image on a distinct portion of the retina; and,

d. at least two of said hydrogel elements having different powers whereby objects at different distances from the eye are simultaneously brought to a focus on distinct portions of the retina; and,

(d) at least two of said lens elements are of different colors.

2. A lens according to claim **1** wherein at least two of said elements are of hydrogel materials having different indices of refraction.

3. A lens according to claim **1** wherein at least two of said elements have different surface curvature.

4. A lens according to claim **3** further including a layer of transparent material overlying one of said front and rear surfaces to provide a smooth surface thereon.

5. A lens according to claim **3** further including first and second layers of transparent material overlying said front and rear surfaces, respectively, to provide smooth surfaces thereon.

6. A lens according to claim wherein the boundaries between said elements include an anti-reflection material.

7. A lens according to claim **1** wherein the surface area of the boundaries between said elements are masked with an opaque material to block passage of rays which would otherwise cause reflections.

8. A lens according to claim **1** wherein said elements are joined with a transparent adhesive material.

9. A lens according to claim **8** wherein said adhesive material includes an anti-reflection additive.

10. A lens according to claim **1** wherein said elements are joined during an extrusion process.

11. A lens according to claim **1** wherein adjacent said elements have different indices of refraction.

12. A lens according to claim **1** comprised of elements each having different indices of refraction.

13. A lens according to claim **12** consisting of three elements.

14. A lens according to claim **1** having at least three elements.

15. A lens according to claim **1** wherein the front surface area of said annular element is greater than the front surface area of said cylindrical element.

16. A lens according to claim **1** wherein said elements providing sharp focus images of near objects are positioned within the inner half of the lens.

17. First and second lenses according to claim **1** for use in left and right eyes wherein like power elements are similarly positioned.

18. A lens according to claim **1** having a planar front surface and a convex rear surface to reduce internal reflections.

19. A lens according to claim **18** wherein the surface areas of the boundaries between said elements are masked with an opaque material to block passage of rays which would otherwise cause reflections.

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