

EDGE DESIGN FOR REDUCING UNWANTED PHOTIC EFFECTS IN INTRAOCULAR LENSES

5 TECHNICAL FIELD

This invention relates generally to the field of intraocular lenses and, more particularly, to an edge design for reducing unwanted photic effects in intraocular lenses.

BACKGROUND OF THE INVENTION

10 The human eye in its simplest terms functions to provide vision by transmitting light through a clear outer portion called the cornea, and focusing the image by way of a crystalline lens onto a retina. The quality of the focused image depends on many factors including the size and shape of the eye, and the transparency of the cornea and the lens. When age or disease causes
15 the lens to become less transparent, vision deteriorates because of the diminished light which can be transmitted to the retina. This deficiency in the lens of the eye is medically known as a cataract. An accepted treatment for this condition is surgical removal of the lens and replacement of the lens function by an artificial intraocular lens (IOL). In the United States, the
20 majority of cataractous lenses are removed by a surgical technique called phacoemulsification. During this procedure, an opening is made in the anterior capsule and a thin phacoemulsification cutting tip is inserted into the diseased lens and ultrasonically vibrated. The vibrating cutting tip liquefies or emulsifies the lens so that the lens may be aspirated out of the eye. The
25 diseased lens, once removed, is replaced by an IOL.

A known difficulty for intraocular lenses has been that off-axis light rays can be reflected or transmitted into the visual field, producing undesirable photic effects. Edge designs for IOLs have been proposed to steer the unwanted light rays to different locations, but depending on the incident angle
30 of the incoming light, this may not address the problem sufficiently and may inadvertently create new photic effects. The problems may be exacerbated in thin lens designs that use particular edge shapes for mechanical stability. There accordingly remains a need to reduce these undesired photic effects.

SUMMARY OF INVENTION

According to an aspect of the present invention, there is provided an intraocular lens (IOL) formed from a soft, foldable material, comprising: an optic having an optical surface with a base curvature corresponding to an optical power of the optic, the optic having an edge thickness at an outer boundary of the optical surface; a peripheral rim formed as a circle surrounding the optic, the peripheral rim having a maximum thickness, the peripheral rim having a continuously curving outer edge extending between the anterior and posterior surfaces of the IOL and intersecting each surface at a respective corner; and a reduced thickness region outside the optical surface of the optic between the peripheral rim and the optic, the reduced thickness region integrally formed with the peripheral rim and the optic and having a reduced thickness relative to the maximum thickness of the peripheral rim and the edge thickness of the optic.