

tures have been developed wherein there is a moderate amount of flexibility associated with such lenses whereby such lenses can flex and bend to compensate for various stresses and contortions of the human eye.

FIG. 9 illustrates the implantation of a preferred embodiment of the present invention wherein an intraocular lens of this invention is implanted into the anterior chamber of a human eye. In FIG. 9, eyeball 34 includes a cornea 36. The geometric center axis of the cornea is depicted by axis line 32 in FIG. 9. Iris 38 defines a circular opening or pupil 40. Annular iris 38 defines a forward or anterior chamber 42 and a posterior chamber 44. Cataract extraction or removal of the natural lens from the eye is normally performed by surgical means through incision 52 which is cut in cornea 36. Scleral spur 46 is an annular inwardly extending flap that lies in a plane roughly parallel to the plane of annular iris 38, thereby forming trabecular meshwork 48 around the interior circumference of the eyeball. Hyloid membrane 50 is disposed behind iris 38 and contains vitreous fluid. The trabecular meshwork is illustrated in the form of annular groove 48 in FIG. 9. The retina of the eye is disposed along the back interior walls of the eyeball and is depicted as region 54. Light entering through cornea 36 must be focused into a sharp image by means of an optical lens onto retina 54 in order for there to be discernable visual perception.

As illustrated in FIG. 9, incision 52 is made into the cornea and the natural lens is removed. Thereafter, the lens of the instant invention is inserted through incision 52. The intraocular lens of this invention is inserted in such a fashion that contact lobes 26 and 28 are seated either in groove 48 or in such other naturally occurring structures of the eyeball whereby the geometric axis 30 of the haptics is accurately aligned with and held in place with the geometric center axis of the cornea. As previously mentioned, however, the geometric axis of the cornea is not at the same point where the optical axis of the pupillary structure exists. By turning to FIGS. 10 and 10a, a view of the right and left eye of a human are graphically illustrated, as viewed from the anterior portions of the eye. It will be noted that the optical axis 32 of the intraocular lenses of this invention are offset from the geometric center of the haptics usually in a direction toward the opposite eye. By utilizing such a configuration, the optical axis of the intraocular lenses of this invention can be positioned precisely in alignment with the pupillary axis of the human eye while the contact lobes 26 and 28 engage and contact the natural structural features of the human eyeball to hold the lens structures in place within the eye.

It will be noted that in FIG. 10, the intraocular lens is graphically illustrated as being inserted and implanted into the right eye of a human. In FIG. 10a, an identical lens to that lens which is implanted into the right eye, is implanted into the left eye. However, the lens implant in FIG. 10a has been rotated 180° about the direction perpendicular to the geometric center axis of the cornea. With that in mind, it will be appreciated that one lens design can be made in many different counterparts and that one lens design and configuration can be utilized both for the right eye and the left eye of a human whereby there can be an exact implantation and alignment of the optical axis of the intraocular lens with the pupillary axis simply by rotating the intraocular lens 180° or any amount dictated by the pupillary axis of the eye as the lens is implanted.

For the average human adult, it has been found that the offset of the optical axis of the intraocular lens of this invention from the geometric axis of the lens should be in the order of one millimeter. It will, of course, be appreciated that such dimensions can vary.

In order to facilitate correct implantation of the lenses of this invention, suitable indicia or markings may be made on the lens structure to assist the surgeon in the proper implantation of the lenses. As shown in FIGS. 10 and 10a, circles and ovals have been imprinted on limb portions 22 and 24. Thus, the ophthalmic surgeon can readily detect the orientation of the lenses as he implants such lenses into the human eye. For example, the limb portion marked with a circle can be implanted into the human eye with the circle indicia appearing upright in the right eye and the oval indicia appearing upright in the left eye. Of course, it will be appreciated that such markings and indicia are for convenience only. Other indicia such as dots, color codes, letters and the like can be also utilized for proper installation and implantation of the lenses of this invention.

The implantation procedures are well known in the art. Any suitable means for forming incisions and inserting the intraocular lenses into the human eye can be utilized. It is well known that various surgical tools, such as forceps, lens implantation tools and the like can be utilized for inserting the lenses into the eye. Suitable examples which can be utilized include forceps that engage and index small apertures adjacent the contact lobes. As shown in FIGS. 10 and 10a, such apertures for use with conventional implantation tools are illustrated by means of apertures 56. Such apertures can also be utilized to secure the implanted lenses into place if suturing is desired to hold the lenses in place within the eye.

While it will be appreciated that FIG. 9 shows the cross section of a human eye with the implantation of the intraocular lens in the anterior chamber, such lenses can also be implanted in the posterior chamber.

It will be appreciated that the foregoing descriptions of the methods and structures of this invention are for illustrative purposes only. The foregoing descriptions should in no way be considered to be a detailed surgical procedure but instead are presented to point out and define the important features of this invention. Well known surgical procedures can readily be followed by those skilled in the art in applying the novel methods and implantation of the novel structures of this invention.

The foregoing specification and drawings have been presented to describe the instant invention. It will be appreciated that various changes and modifications may be made in the foregoing specification and drawings without departing from the spirit and scope of this invention.

What is claimed is:

1. An intraocular lens structure suitable for use as an artificial lens implant which comprises a light focusing lens body and a plurality of oppositely disposed support members for supporting said intraocular lens structure upon implantation in the eye, said oppositely disposed support members terminating with a plurality of oppositely disposed contact lobes having intersecting axis lines that define the geometric center of said support members and which are adapted to contact natural regions of the eye upon implantation, to position the intersection of the axis lines which are defined by the oppositely disposed contact lobes in alignment with and