

Typically, the inventive intraocular lens structure will have a total length of from about 9 millimeters to about 14 millimeters, a width of from about 4 millimeters to about 14 millimeters and can be fabricated having a wide range of index of refraction. The deformable optical zone portion will typically have a thickness of from about 0.1 millimeters to about 1.0 millimeters and a diameter in the range of from about 4 millimeters to about 6 millimeters.

Any conventional method for manufacture of the inventive lens can be utilized in accordance with the present invention to insure that the lens has an elongation to break within the prescribed range as aforementioned herein. For instance, compression molding, transfer molding, injection molding, casting, machining, or combination of these techniques may be utilized to produce the inventive lens.

The deformable intraocular lens structures in accordance with the present invention also facilitate removal of the lens from the eye atraumatically should a complication arise after implant, necessitating its removal from the eye.

Those skilled in the art will readily appreciate that other less preferred procedures could be utilized to effect deformation of the lens during implantation. For instance, a lens fabricated from hydrophilic material could be implanted in a dry state and hydrated once in position to return to its desired configuration and fixed focal length. Alternatively, the lens could be implanted in a plurality of separate components which are built up in the eye and suitably attached to one another, for instance by a medical grade adhesive.

The lens holding chamber and lens holding compartment of the implantation devices depicted in FIGS. 37 through 49 can, of course, be fabricated having a wide variety of suitable configurations for containing the deformable intraocular lens therein. In this respect, the chamber and compartment having pre-deformed lenses contained therein can be conveniently dispensed separately from the injection type devices.

Additionally, the intraocular lens structure in accordance with the present invention may comprise a base member having at least one surface layer thereon. For instance, a base member composed of an elastomer can be encased within a surface layer of hydrophilic material to enhance tissue compatibility.

Accordingly, the present invention offers a unique implantation system for correction of or replacement of human crystalline lens after, for instance, cataract removal by way of small incision technique. The system therefore provides an implantation technique with attendant surgical safety, convenience and a comfortable fit for the eye.

The described lens implant procedures and devices, thus minimize the principle disadvantages attendant with conventional rigid intraocular lens implantation which requires a relatively large incision in the ocular tissue which, among other disadvantages, leads to a relatively high complication rate and longer recovery times.

It will be apparent from the foregoing that, while particular forms of the invention have been illustrated and described, various modifications can be made without departing from the spirit and scope of the invention. Accordingly, it is not intended that the invention be limited, except as by the appended claims.

I claim:

1. A method for implantation of an artificial intraocular lens for replacement of a surgically removed crystalline lens, the method comprising the steps of:

providing an intraocular lens having a deformable optical zone portion with prescribed memory characteristics; deforming said intraocular lens by compressing said optical zone portion to a diameter of about 80% or less of the cross-sectional diameter of the optic in an unstressed state; inserting the intraocular lens through a relatively small incision made in the ocular tissue; allowing the lens implant to return to its original configuration, full size and fixed focal length after insertion in the eye; whereby a safer, more convenient surgical procedure and more comfortable fit for the eye is achieved.

2. The method for implantation as defined in claim 1 wherein said intraocular lens is inserted and allowed to return to its original configuration, full size and fixed focal length in a position in front of the iris and the pupil of the eye.

3. The method for implantation of an artificial intraocular lens as defined in claim 1 wherein said intraocular lens is inserted and allowed to return to its original configuration, full size and fixed focal length in a position behind the iris and the pupil of the eye.

4. A method for implantation of an artificial intraocular lens for replacement of a surgically removed crystalline lens, the method comprising the steps of:

providing an intraocular lens having a deformable optical zone portion with prescribed memory characteristics; deforming said intraocular lens by rolling said optical zone portion to a diameter of about 80% or less of the cross-sectional diameter of the optic in an unstressed state; inserting the intraocular lens through a relatively small incision made in the ocular tissue; allowing the lens implant to return to its original configuration, full size and fixed focal length after insertion in the eye; whereby a safer, more convenient surgical procedure and more comfortable fit for the eye is achieved.

5. The method for implantation as defined in claim 4 wherein said intraocular lens is inserted and allowed to return to its original configuration, full size and fixed focal length in a position in front of the iris and the pupil of the eye.

6. The method for implantation of an artificial intraocular lens as defined in claim 4 wherein said intraocular lens is inserted and allowed to return to its original configuration, full size and fixed focal length in a position behind the iris and the pupil of the eye.

7. A method for implantation of an artificial intraocular lens for replacement of a surgically removed crystalline lens, the method comprising the steps of:

providing an intraocular lens having a deformable optical zone portion with prescribed memory characteristics; deforming said intraocular lens by folding said optical zone portion to a diameter of about 80% or less of the cross-sectional diameter of the optic in an unstressed state; inserting the intraocular lens through a relatively small incision made in the ocular tissue; allowing the lens implant to return to its original configuration, full size and fixed focal length after insertion in the eye; whereby a safer, more convenient surgical procedure and more comfortable fit for the eye is achieved.

8. The method for implantation as defined in claim 7 wherein said intraocular lens is inserted and allowed to