

The intraocular lens **1300** of FIG. **66** has an optic **1302**, preferably configured, in side view, as shown in FIGS. **58** and **59** to provide the earlier described advantages and operation of the FIG. **59** embodiment of the invention. A plurality of relatively small extension portions or haptic plates **1304** having hinges **1306** to facilitate posterior and anterior movement of the optic in response to ciliary muscle action. The hinges **1336** are defined by grooves in the haptic plates and/or by grooves **1306a** in the loops. Hinging action of the plates can alternatively be provided by forming the haptics of a flexible material.

Two pairs of the haptics extend oppositely from the optic, and a loop **1310** extends between each pair of haptics, and is secured to the haptics. An arm **1312** extends from an arcuate transverse portion of each loop **1310** at an acute angle from the transverse portion. Each arm **1312** has an end protuberance defining an opening **1314** for improved fixation and centration.

FIG. **67** illustrates a related embodiment **1350** having an optic **1352**, and loops **1354** extending outwardly between pairs of spaced, radially extending small haptics or extension portions **1356**. As with the embodiment of FIG. **66**, hinging action may be provided by grooves **1356** in the haptics or by grooves **1356a** in the loops. An arm **1358** extends from each loop at an acute angle thereto, and has a protuberance **1360** defining a sizable opening at its end, as shown. Improved fibrosis securement and centration, are provided, with or without the opening therein, by the protuberance. The protuberances **1314** of FIG. **66** and **1360** of FIG. **67**, preferably with the openings therein, are important features in that they provide substantially improved retention and centration by fibrosis. The arms **1358** and their protuberances **1360**, as well as the loops **1358**, are preferably formed of a relatively non-inert material for improved fibrosis thereabout.

Thus there has been shown and described a novel accommodating intraocular lens which fulfills all the objects and advantages sought therefor. Many changes, modifications, variations and other uses and applications of the subject invention will, however, become apparent to those skilled in the art after considering this specification together with the accompanying drawings and claims. All such changes, modifications, variations and other uses and applications which do not depart from the spirit and scope of the invention are deemed to be covered by the invention which is limited only by the claims which follow.

What is claimed is:

**1.** An accommodating intraocular lens comprising:

a lens body having anterior and posterior sides, said lens body including:

an optic;

a first and second pair of haptic supports, each haptic support having an inner end adjacent said optic and an outer end extending from said optic;

at least one loop haptic extending between each haptic support of said first pair of haptic supports and at least one loop haptic extending between each haptic support of said second pair of haptic supports, said loop haptics having outer portions extending from said haptic supports; and

wherein, said lens body is adapted to be disposed in a natural capsular bag of the eye and is operable to move the optic posteriorly and anteriorly relative to said loop haptic outer portions in response to forces imparted by ciliary muscle relaxation and constriction, respectively.

**2.** The accommodating intraocular lens as claimed in claim **1**, further including at least one arm having an inner

end connected to said loop haptic and an outer end extending from said loop haptic.

**3.** The accommodating intraocular lens as claimed in claim **2**, wherein said arm has an enlarged outer end.

**4.** The accommodating intraocular lens as claimed in claim **3**, wherein said enlarged outer end of said arm has an opening therethrough.

**5.** The accommodating intraocular lens as claimed in claim **3**, wherein said enlarged outer end of said arm is disc shaped.

**6.** The accommodating intraocular lens as claimed in claim **3**, wherein said enlarged outer end of said arm is formed from a biologically inert material selected from the group consisting of PMMA, Acrylic, Prolene, and Polyimide.

**7.** The accommodating intraocular lens as claimed in claim **2**, wherein at least a portion of said arm is formed from a biologically inert material selected from the group consisting of PMMA, Acrylic, Prolene, and Polyimide.

**8.** The accommodating intraocular lens as claimed in claim **2**, wherein at least a portion of said arm is formed from a biologically inert material selected from the group consisting of Silicone, Polyhema and HEMA.

**9.** The accommodating intraocular lens claimed in claim **2**, wherein said arm extends from said loop haptic at an acute angle thereto.

**10.** The accommodating intraocular lens as claimed in claim **1**, wherein said haptic supports include a hinge and about which the optic moves posteriorly and anteriorly in response to forces imparted by ciliary muscle relaxation and constriction.

**11.** The accommodating intraocular lens as claimed in claim **10**, wherein said loop haptics have at least one hinge and about which the optic moves posteriorly and anteriorly in response to forces imparted by ciliary muscle relaxation and constriction.

**12.** The accommodating intraocular lens as claimed in claim **10**, wherein said haptic support hinge is a groove across an anterior surface of said haptic support.

**13.** The accommodating intraocular lens as claimed in claim **1**, wherein said loop haptics have at least one hinge and about which the optic moves posteriorly and anteriorly in response to forces imparted by ciliary muscle relaxation and constriction.

**14.** The accommodating intraocular lens as claimed in claim **13**, wherein said loop haptic hinge is a groove across an anterior surface of said loop haptic.

**15.** The accommodating intraocular lens as claimed in claim **1**, wherein said haptic supports are formed from a flexible material.

**16.** The accommodating intraocular lens as claimed in claim **15**, wherein said flexible material is silicone.

**17.** The accommodating intraocular lens as claimed in claim **15**, wherein said flexible material is a hydrogel.

**18.** The accommodating intraocular lens as claimed in claim **1**, wherein at least a portion of said loop haptic is formed from a biologically inert material selected from the group consisting of PMMA, Acrylic, Prolene, and Polyimide.

**19.** The accommodating intraocular lens as claimed in claim **1**, wherein at least a portion of said loop haptic is formed from a biologically inert material selected from the group consisting of Silicone, Polyhema and HEMA.

**20.** The accommodating intraocular lens as claimed in claim **1**, wherein said haptic supports are equally spaced about said optic.

**21.** The accommodating intraocular lens as claimed in claim **1**, wherein said haptic supports comprising said first