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**Zadno-Azizi**

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(54) **INTRAOCULAR LENS WITH  
POST-IMPLANTATION ADJUSTMENT  
CAPABILITIES**

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See application file for complete search history.

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

1,483,509 A 5/1921 Bugbee  
2,129,305 A 9/1938 Feinbloom  
2,274,142 A 2/1942 Houchin  
2,405,989 A 8/1946 Beach  
2,511,517 A 6/1950 Spiegel

(Continued)

**FOREIGN PATENT DOCUMENTS**

AU 3225789 A1 10/1989  
DE 2702117 A1 7/1978

(Continued)

**OTHER PUBLICATIONS**

Amo Specs Model AC-21B, 1992.

Chiron, Clemente Optfit Model SP525, Brochure Translation, Jul.  
12, 1998.

Chiron Vision, Nuvita Mar. 20, 1997 (Chiron Vision Corp. 1997), 6  
pages.

Fechner P.U., et al., "Iris-Claw Lens In Phakic Eyes To Correct  
Hyperopia: Preliminary Study," Journal of Cataract and Refractive  
Surgery, 1998, vol. 24 (1), pp. 48-56.

(Continued)

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(57) **ABSTRACT**

Disclosed are accommodating intraocular lenses for implan-  
tation in an eye having an optical axis. In certain embod-  
iments, an intraocular lens includes an anterior optic, a poste-  
rior optic, and a support structure configured to move the  
optics relative to each other along an optical axis between an  
accommodated state and an unaccommodated state. In cer-  
tain embodiments, at least a portion of the support structure  
can be modified in situ to alter reaction forces between the  
support structure and at least one structure of the eye. In  
certain embodiments, a refractive property of one of the ante-  
rior or posterior optics can be modified in situ while leaving  
the refractive properties of the remaining one of the anterior  
or posterior optics substantially unaffected. Additional  
embodiments and methods are also disclosed.

**7 Claims, 66 Drawing Sheets**

