US007071279B2

(12) **United States Patent**
Liao

(10) **Patent No.: US 7,071,279 B2**
(45) **Date of Patent: *Jul. 4, 2006**

(54) **HIGH REFRACTIVE INDEX AND OPTICALLY CLEAR COPOLY (CARBOSILANE AND SILOXANE) ELASTOMERS**

(75) Inventor: **Xiugao Liao**, Irvine, CA (US)

(73) Assignee: **STAAR Surgical Company**, Monrovia, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **10/826,498**

(22) Filed: **Apr. 16, 2004**

(65) **Prior Publication Data**

US 2004/0198865 A1 Oct. 7, 2004

Related U.S. Application Data

(62) Division of application No. 10/308,803, filed on Dec. 3, 2002.

(51) **Int. Cl.**
C08G 77/12 (2006.01)

(52) **U.S. Cl.** **528/31**; 528/32; 524/91; 524/359; 524/588

(58) **Field of Classification Search** 623/400; 528/25, 31, 32; 523/106, 113
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,153,641 A	5/1979	Deichert et al.	
4,189,546 A	2/1980	Deichert et al.	
4,254,248 A	3/1981	Friends et al.	
4,259,467 A	3/1981	Keogh et al.	
4,327,203 A	4/1982	Deichert et al.	
4,647,282 A	3/1987	Fedorov et al.	
5,077,335 A	12/1991	Schwabe et al.	
5,236,970 A	8/1993	Christ et al.	
5,371,147 A	12/1994	Spinelli et al.	
5,376,694 A	12/1994	Christ et al.	
5,444,106 A	8/1995	Zhou et al.	
5,451,617 A	9/1995	Lai et al.	
5,494,946 A	2/1996	Christ et al.	
5,512,609 A	4/1996	Yang	
5,623,029 A	4/1997	Yang	
5,661,195 A	8/1997	Christ et al.	
5,869,549 A	2/1999	Christ et al.	
5,945,498 A	8/1999	Hopken et al.	
5,962,548 A	10/1999	Vanderlaan et al.	
5,981,669 A	11/1999	Valint, Jr. et al.	
5,981,675 A	11/1999	Valint, Jr. et al.	
6,020,445 A	2/2000	Vanderlaan et al.	
6,066,172 A	5/2000	Huo et al.	
6,139,576 A	10/2000	Doyle et al.	
6,255,362 B1	7/2001	Ito	
6,277,147 B1	8/2001	Christ et al.	
6,361,561 B1	3/2002	Huo et al.	
6,534,587 B1 *	3/2003	Tapsak et al.	524/588

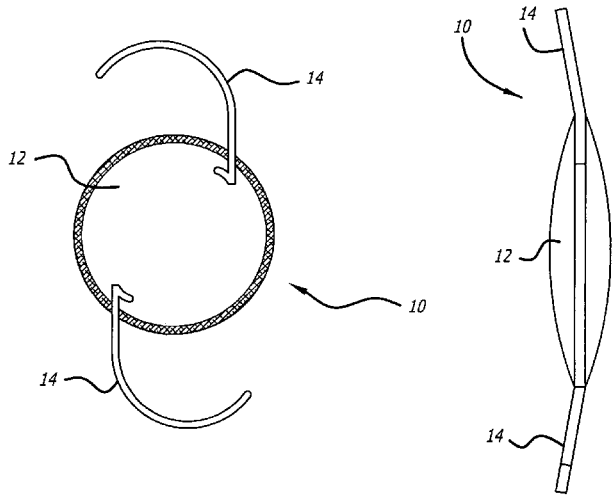
FOREIGN PATENT DOCUMENTS

JP	60-120755 A	*	6/1985
JP	2000131655 A		5/2000
JP	2000131655 A	*	5/2000

* cited by examiner

Primary Examiner—Marc S. Zimmer
(74) *Attorney, Agent, or Firm*—Fulwider Patton LLP

(57) **ABSTRACT**

High refractive index and optically clear copoly(carbosilane and siloxane) elastomers and ophthalmic lenses made therefrom are provided. The elastomers are comprised of copolymers having carbosilane repeat units and siloxane repeat units. The copolymers and ophthalmic lenses of the present invention have a high refractive index and excellent folding recoverability.

6 Claims, 2 Drawing Sheets