US005752974A

United States Patent [19]

Rhee et al.

[11] **Patent Number: 5,752,974**

[45] **Date of Patent: May 19, 1998**

[54] **INJECTABLE OR IMPLANTABLE BIOMATERIALS FOR FILLING OR BLOCKING LUMENS AND VOIDS OF THE BODY**

[75] Inventors: **Woonza M. Rhee**, Palo Alto; **Richard A. Berg**, Los Altos; **George H. Chu**, Cupertino; **Frank A. DeLustro**, Belmont; **Dan M. Jolivette**, Menlo Park, all of Calif.; **Kimberly A. McCullough**, Kirkland, Wash.

[73] Assignee: **Collagen Corporation**, Palo Alto, Calif.

[21] Appl. No.: **574,050**

[22] Filed: **Dec. 18, 1995**

[51] **Int. Cl.**[6] **A61B 17/00**

[52] **U.S. Cl.** **606/214**; 606/1

[58] **Field of Search** 606/213, 214, 606/215, 216, 1

[56] **References Cited**

U.S. PATENT DOCUMENTS

4,963,146	10/1990	Li .	
5,019,087	5/1991	Nichols .	
5,196,185	3/1993	Silver et al.	424/45
5,204,382	4/1993	Wallace et al. .	
5,213,580	5/1993	Slepian et al.	623/1
5,443,481	8/1995	Lee	606/213
5,456,693	10/1995	Conston et al.	606/192
5,475,052	12/1995	Rhee et al.	525/54.1
5,480,644	1/1996	Freed	424/436
5,571,181	11/1996	Li	606/213

FOREIGN PATENT DOCUMENTS

0668081	8/1995	European Pat. Off. .
0697218	2/1996	European Pat. Off. .
0713707	5/1996	European Pat. Off. .
0732109	9/1996	European Pat. Off. .
WO 94/01483	1/1994	WIPO .
WO 403119	2/1994	WIPO .

OTHER PUBLICATIONS

"Hysteroscopic Approaches for Tubal Closure," John J. Sciarra, *Research Frontiers in Fertility Regulation*, 1980, Chapter 26, pp. 270–286.

Longaker et al. "Maternal Outcome After Open Fetal Surgery: A Review of the First 17 Human Cases", *J. Amer. Med Assoc.*, 265(6):737–741.

Primary Examiner—Jeffrey A. Schmidt

Attorney, Agent, or Firm—Morrison & Foerster, LLP

[57] **ABSTRACT**

Methods for completely or partially blocking, augmenting, sealing, or filling various biological lumens and voids within the body of a patient are disclosed. Lumens include arteries, veins, intestines, Fallopian tubes, and trachea. Voids include various lesions, fissures, diverticulae, cysts, fistulae, aneurysms, or other undesirable voids that may exist within a patient's body. In the most general method of the invention, an effective amount of a biomaterial is administered (e.g., via injection, catheter, or surgical implantation) into the lumen or void. Preferred biomaterial compositions for use in the present invention are disclosed.

48 Claims, No Drawings