

- [54] **SYNTHETIC POLYMER PROSTHESIS MATERIAL**
- [75] Inventors: **Donald J. Lyman; Frank J. Fazzio**, both of Salt Lake City, Utah
- [73] Assignee: **University of Utah**, Salt Lake City, Utah
- [21] Appl. No.: **654,831**
- [22] Filed: **Feb. 3, 1976**
- [51] Int. Cl.² **C08G 18/14; A61F 1/24**
- [52] U.S. Cl. **521/64; 3/1; 3/1.4; 3/1.7; 260/30.8 DS; 260/32.6 NR; 264/41; 428/315; 428/425**
- [58] Field of Search **264/41; 3/1, 1.4, 1.7; 260/2.5 A, 2.5 AD, 2.5 AY, 2.5 M; 428/315; 521/64**

3,862,452	1/1975	Wichterle	3/1.4
4,010,494	3/1977	Sauer	3/1
4,021,382	5/1977	Stoy	260/2.5 M

Primary Examiner—H. S. Cockeram
Attorney, Agent, or Firm—Criddle, Thorpe & Western

[57] **ABSTRACT**

A blood and body-tissue compatible synthetic polymer having mechanical compliance properties matching that of body tissue, useful in prosthesis as vascular grafts, skin covering, small diameter body duct work, and similar tissue replacement materials. A block copolymer having suitable body and blood compatibility characteristics is dissolved in a solvent, yielding a solution having an approximate relative viscosity between the range of 100 to 1000. A clean mandrel is slowly dipped into the solution and slowly withdrawn, leaving a uniform coating of polymer solution over the forming surface of the mandrel. The coated mandrel is then immersed into a second, nonsolvent solution which is miscible with the first solvent. The resulting transfer of the nonsolvent solution into the polymer network, displacing the first solvent molecules, acts to precipitate the polymer in a physical form containing a uniform dispersion of voids throughout the polymer structure. Such voids provide a mechanical response to the final polymer material which parallels that of natural arterial tissue, while at the same time retaining the necessary compatibility characteristics for prosthesis.

[56] **References Cited**
U.S. PATENT DOCUMENTS

2,540,906	2/1951	Overton et al.	264/49 X
3,449,153	6/1969	Saligny	260/2.5 AY
3,483,015	12/1969	Fukushima	260/2.5 AY
3,512,183	5/1970	Sharp	3/1.4
3,555,129	1/1971	Fukada	260/2.5 M
3,622,526	11/1971	Zorn	260/2.5 AY
3,644,233	2/1972	Traubel	260/2.5 AY
3,664,979	5/1972	Tanomura	260/2.5 AY
3,700,380	10/1972	Kitrilakis	3/1
3,720,631	3/1973	Fukushima	260/2.5 AY
3,743,530	7/1973	Oohara	260/2.5 AY
3,803,061	4/1974	Fabre	260/2.5 M
3,853,462	12/1974	Smith	3/1.4

22 Claims, 1 Drawing Figure

