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United States Patent [19] Summers

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[54] **STENT FOR SUPPORTING A BLOOD VESSEL**

4,856,516	8/1989	Hillstead	604/104
4,877,030	10/1989	Beck et al.	128/343
4,886,062	12/1989	Wiktor	128/343
4,902,290	2/1990	Fleckenstein et al.	623/1

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(List continued on next page.)

[73] **Assignee:** American BioMed, Inc., The Woodlands, Tex.

FOREIGN PATENT DOCUMENTS

[*] **Notice:** The term of this patent shall not extend beyond the expiration date of Pat. No. 5,342,387.

0282175	9/1988	European Pat. Off.	A61F 2/06
0380666	8/1990	European Pat. Off.	A61L 31/00
0417928	3/1991	European Pat. Off.	A61M 29/00
2678508	1/1993	France	A61F 2/06

[21] **Appl. No.:** 367,239

OTHER PUBLICATIONS

[22] **PCT Filed:** Jun. 16, 1993

Technical Developments and Instrumentation; *Transluminal Expandable Nitinol Coil Stent Granting; Preliminary Report*; Charles T. Dotter, M.D., Robert W. Buschmann, P.A.C., Montgomery K. McKinney, Josef Rösch, M.D.; 2 pgs.

[86] **PCT No.:** PCT/US93/05823

§ 371 Date: Dec. 16, 1994

§ 102(e) Date: Dec. 16, 1994

Artificial Organs; *Characterization of Rehydrated Gelatin Gels*; Hideto Emoto, Helen Kambic, Ji-Feng Chen, and Yukihoko Nosé; 1991 International Society for Artificial Organs; 6 pgs.

[87] **PCT Pub. No.:** WO94/00179

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Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 900,896, Jun. 18, 1992, Pat. No. 5,342,387.

[57] ABSTRACT

[51] **Int. Cl.⁶** A61M 29/02

[52] **U.S. Cl.** 606/198; 623/1

[58] **Field of Search** 606/198, 191, 606/108; 623/1, 12

A stent comprising a coil including a plurality of arcuate sections that alternate directions around a central axis, each arcuate section including a pair of curved turns joined by a cusp, and the cusps of adjacent arcuate sections intermeshing and defining at least one region of overlap, which in turn describes a helix around and along the length of the coil. In the preferred embodiment, there are two regions of overlap, which together describe a double helix. In another preferred embodiment, the stent is bifurcated so as to support a branched vessel or the like.

[56] References Cited

U.S. PATENT DOCUMENTS

4,120,649	10/1978	Schechter	8/94
4,378,224	3/1983	Nimni et al.	8/94
4,536,179	8/1985	Anderson et al.	604/266
4,553,545	11/1985	Maass et al.	128/341
4,580,568	4/1986	Gianturco	128/345
4,733,665	3/1988	Palmaz	128/343
4,784,659	11/1988	Fleckenstein et al.	623/1
4,800,882	1/1989	Gianturco	128/343
4,820,302	4/1989	Woodroof	623/8
4,828,561	5/1989	Woodroof	623/8
4,830,003	5/1989	Wolff et al.	128/343

A method for forming a stent, including the steps of providing a flat sheet of material, chemically etching said sheet to form a blank, and forming said blank into a cylindrical coil. The coiling step is preferably carried out on a plurality of rollers.

10 Claims, 15 Drawing Sheets

