



US006042578A

United States Patent [19]
Dinh et al.

[11] **Patent Number:** **6,042,578**
[45] **Date of Patent:** ***Mar. 28, 2000**

[54] **CATHETER REINFORCING BRAIDS**
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5,403,292 4/1995 Ju .
5,451,209 9/1995 Ainsworth et al. 604/96
5,496,291 3/1996 Spencer 604/280
5,514,236 5/1996 Avellanet et al. .
5,522,832 6/1996 Kugo et al. .
5,527,325 6/1996 Conley et al. .

(List continued on next page.)

[73] Assignee: **Schneider (USA) Inc.**, Maple Grove, Minn.
[*] Notice: This patent is subject to a terminal disclaimer.

FOREIGN PATENT DOCUMENTS

0520692A1 12/1992 European Pat. Off. .
93/08986 5/1993 WIPO .
9601664 1/1996 WIPO .
9737713 10/1997 WIPO .

[21] Appl. No.: **08/833,639**
[22] Filed: **Apr. 8, 1997**

OTHER PUBLICATIONS

Definition of polytetrafluoroethylene from Hawley's Condensed Chemical Dictionary, Twelfth Edition, Revised by Richard J. Lewis, Sr., p. 942, 1993.

Related U.S. Application Data

[63] Continuation-in-part of application No. 08/645,381, May 13, 1996, abandoned.
[51] **Int. Cl.**⁷ **A61M 25/00**
[52] **U.S. Cl.** **604/527; 604/524**
[58] **Field of Search** **604/280, 282, 604/264, 265, 524, 526, 527, 529, 532**

Search Report dated Sep. 29, 1997 in corresponding European Patent Application No. 97201366.8, together with Communication, Supplementary Sheet B (1 page), and two-page Annex.

"Declaration of Thomas E. Eibs in Support of Supplemental Information Disclosure Statement," dated Sep. 9, 1996. (The original Declaration is on file in parent application serial No. 08/645,381.)

Search Report dated Jan. 16, 1998 in corresponding European Patent Application No. 97201366.8, together with Communication and two-page Annex.

[56] **References Cited**

U.S. PATENT DOCUMENTS

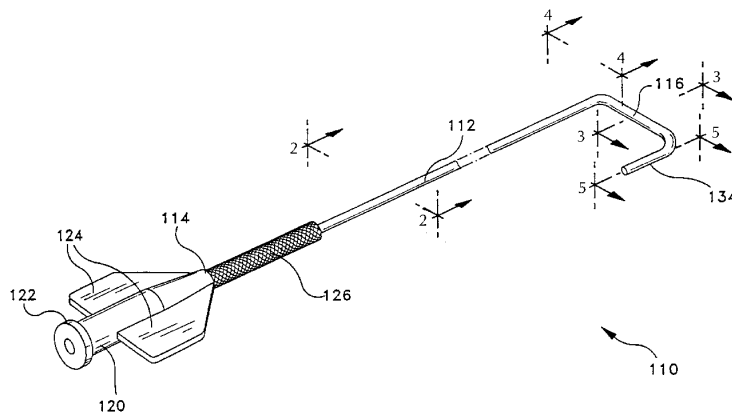
4,531,943 7/1985 Van Tassel et al. 604/280
4,646,742 3/1987 Packard et al. 128/344
4,898,591 2/1990 Jang et al. 604/282
4,994,032 2/1991 Sugiyama et al. .
4,998,923 3/1991 Samson et al. 606/194
5,035,694 7/1991 Kasprzyk et al. 606/27
5,176,661 1/1993 Evard et al. 604/282
5,180,376 1/1993 Fischell .
5,201,757 4/1993 Heyn et al. 606/198
5,221,270 6/1993 Parker 604/282
5,248,305 9/1993 Zdrahala .
5,256,144 10/1993 Kraus et al. 604/96
5,312,356 5/1994 Engelson et al. 604/164
5,342,383 8/1994 Thomas .
5,357,955 10/1994 Wolf et al. 128/634
5,387,199 2/1995 Siman et al. 604/282

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Assistant Examiner—Deborah Blyveis
Attorney, Agent, or Firm—Crompton, Seager & Tufte, LLC

[57] **ABSTRACT**

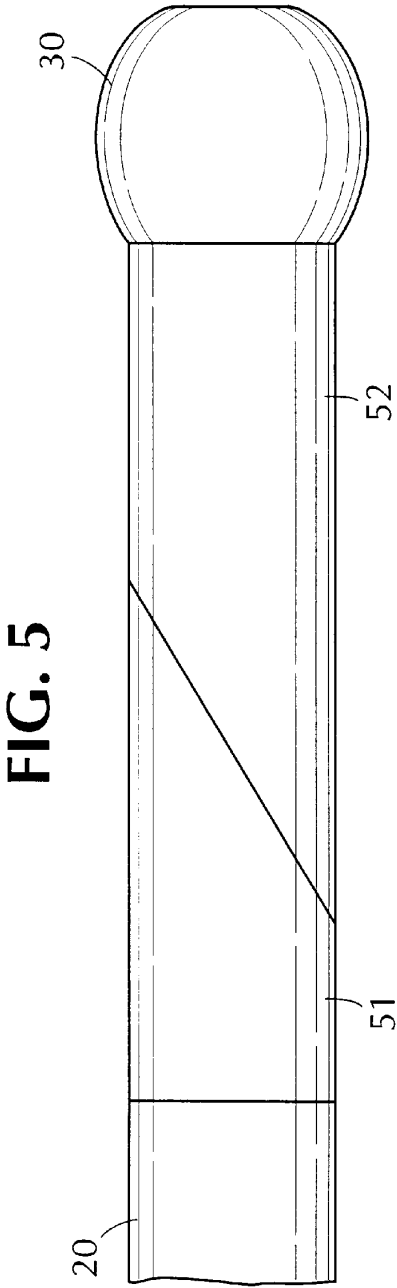
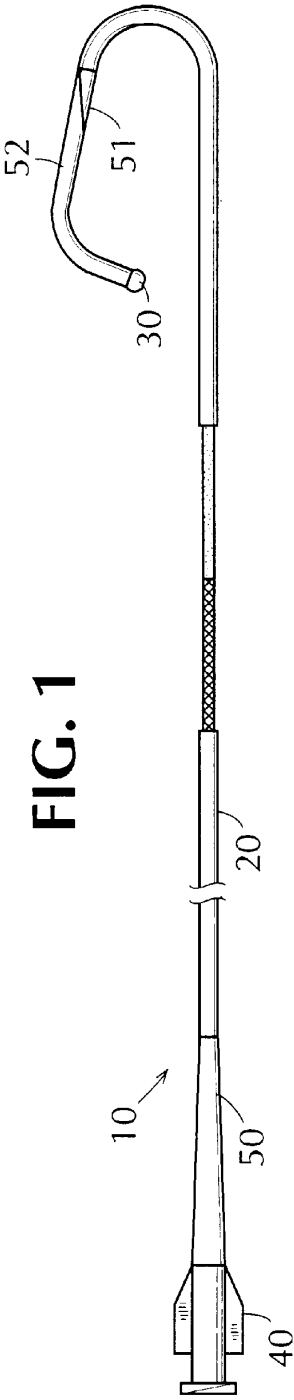
An intravascular catheter having an elongated tubular body with a proximal portion, a distal portion and a lumen extending therebetween. The tubular body is formed with polymeric materials, preferably containing no radiopaque filler, and metallic reinforcing braiding configured to provide the catheter with radiopaque properties and/or kink resistance.

19 Claims, 8 Drawing Sheets



U.S. PATENT DOCUMENTS

5,531,719	7/1996	Takahashi .	5,573,520	11/1996	Schwartz et al. .	
5,533,987	7/1996	Pray et al. .	5,573,522	11/1996	Houser et al.	604/282
5,538,513	7/1996	Okajima .	5,599,325	2/1997	Ju et al. .	
5,545,151	8/1996	O'Connor et al. .	5,695,468	12/1997	Lafontaine et al. .	
5,565,523	10/1996	Chen et al. .	5,725,513	3/1998	Ju et al.	604/280
5,569,200	10/1996	Umeno et al.	5,728,063	3/1998	Preissman et al. .	
5,569,220	10/1996	Webster, Jr.	5,741,333	4/1998	Frid	623/12
5,569,221	10/1996	Houser et al.	5,755,704	5/1998	Lunn	604/282-



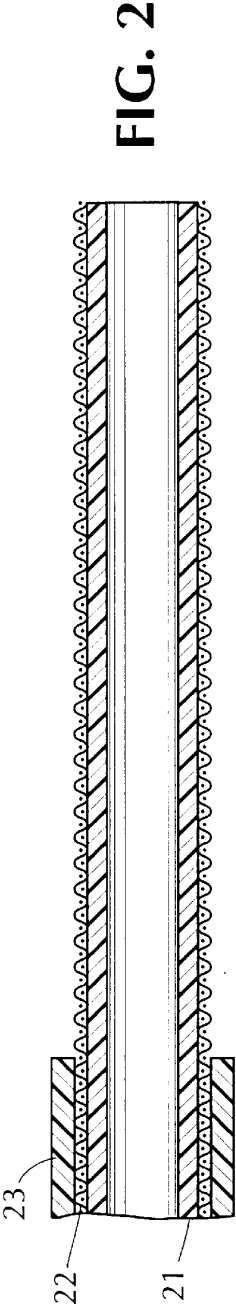


FIG. 2

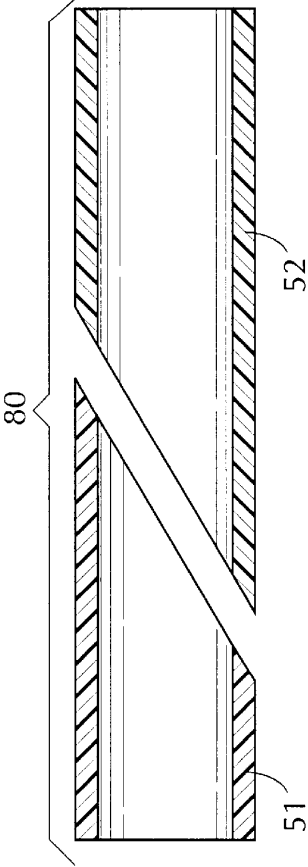


FIG. 3

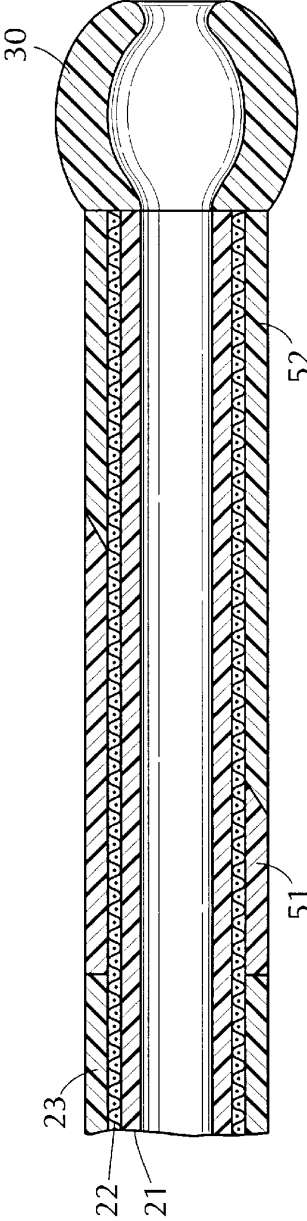
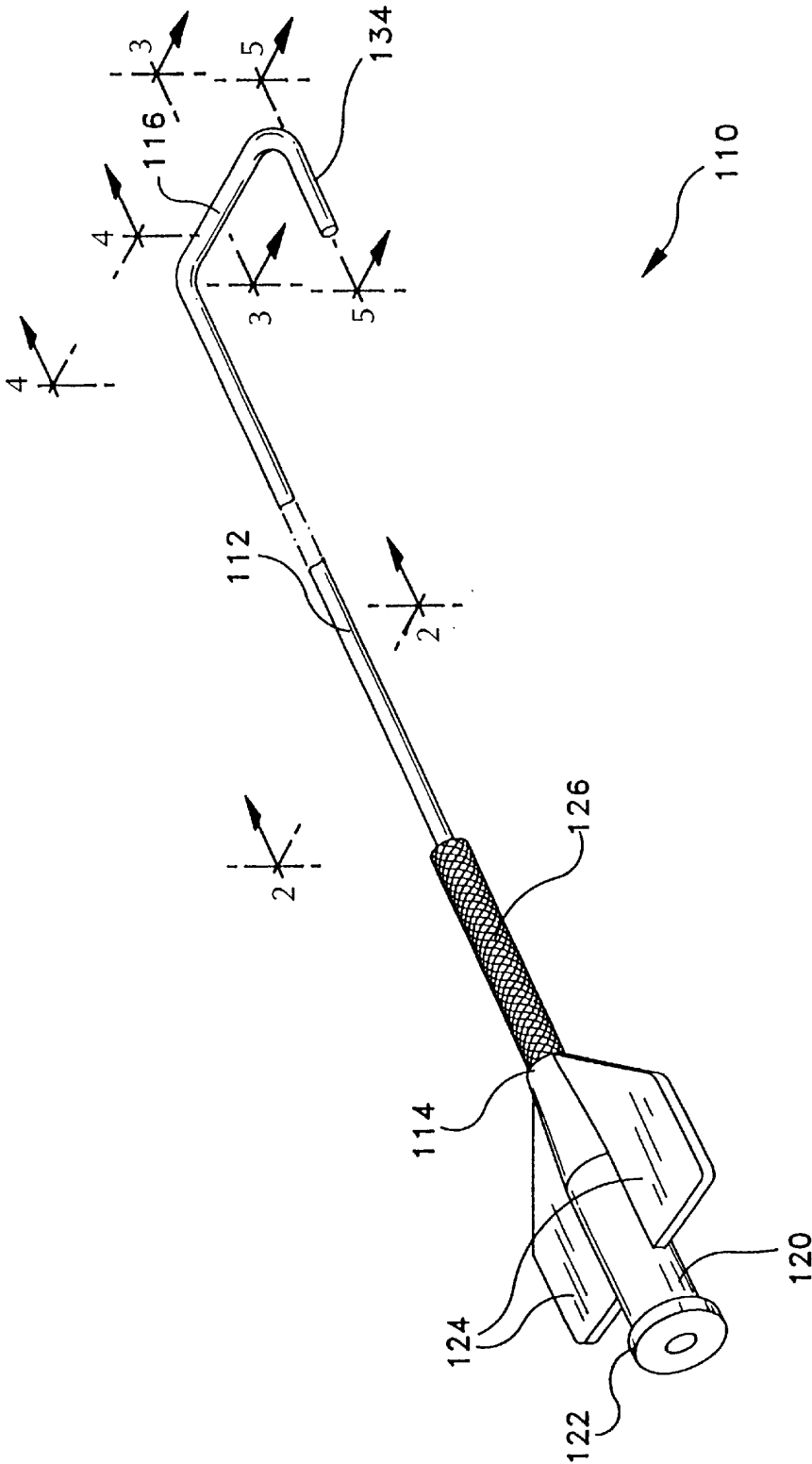


FIG. 4

FIG. 6



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