



(12) **United States Patent**
Ellis et al.

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(54) **STENT DELIVERY SYSTEM WITH STENT SECUREMENT MEANS**

5,026,377 A 6/1991 Burton et al.
5,037,392 A 8/1991 Hillstead

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(List continued on next page.)

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FOREIGN PATENT DOCUMENTS

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

EP	0 266 957 A2	5/1988
EP	0 442 657 A2	9/1991
EP	0 257 091 B1	7/1993
EP	0 553 960 A1	8/1993
EP	0 627 201 A1	12/1994
EP	0 699 451 A2	3/1996
EP	0 707 837 A1	4/1996
WO	WO 93/19703	10/1993
WO	WO 96/03072	2/1996
WO	WO 96/03092 A1	2/1996

This patent is subject to a terminal disclaimer.

OTHER PUBLICATIONS

(21) Appl. No.: **09/420,249**

Julio C. Palmaz et al., Expandable Intraluminal Graft: A Preliminary Study, Work in Progress, From the Departments of Radioloty (J.C.P., R.R.S., S.R.R.) and Pathology (F.O.T.) Universitij of Texax Health Science Center at Sanantonio and Memorial Medical Center (W.J.K.), Corpus Christi, Texas, *Radiology*, vol. 356, No. 1, pp. 73-77.

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Primary Examiner—Justine R. Yu

Related U.S. Application Data

(74) *Attorney, Agent, or Firm*—Vidas, Arrett & Steinkraus

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(51) **Int. Cl.⁷** **A61F 11/00**

(57) **ABSTRACT**

(52) **U.S. Cl.** **606/108; 606/194**

A stent delivery system to facilitate introduction and placement of a stent, including a catheter having an expandable distal portion constructed and arranged for expanding the outer diameter of the catheter from a contracted state to an expanded state: a stent positioned around the distal portion of the catheter having a contracted condition and being expandable to an expanded condition, and being sized in the contracted condition to closely surround the catheter in the contracted state, the expandable distal portion of the catheter including a balloon within which there is included on the catheter shaft at least one body of a diameter larger than the catheter shaft to which the stent and balloon are fitted, as by crimping, for holding the stent in place until it is released therefrom by expansion of the balloon.

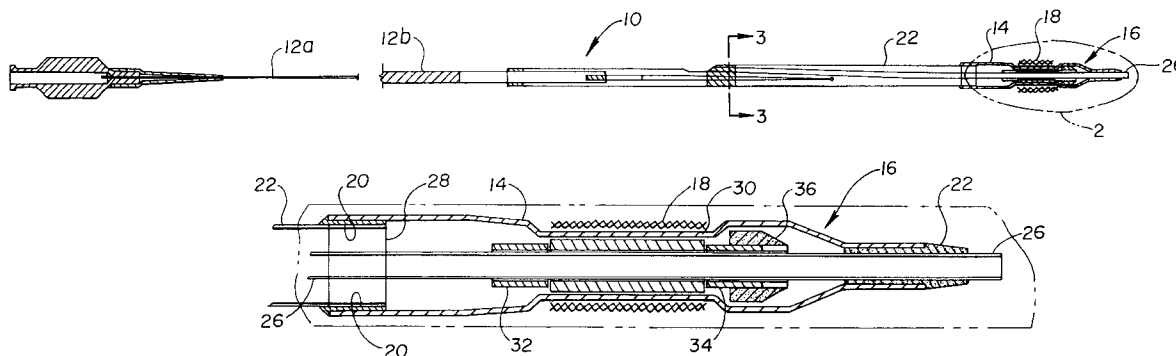
(58) **Field of Search** 606/194, 195, 606/198, 108

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,328,056 A	5/1982	Snooks	
4,338,942 A	7/1982	Fogarty	
4,423,725 A	1/1984	Baran et al.	
4,608,984 A	9/1986	Fogarty	
4,733,665 A	3/1988	Palmaz	
4,740,207 A	4/1988	Kreamer	
4,744,366 A	5/1988	Jang	
4,848,343 A	7/1989	Walstein et al.	
4,875,480 A	10/1989	Imbert	
4,950,227 A *	8/1990	Savin et al.	606/192
5,007,926 A	4/1991	Derbyshire	

37 Claims, 4 Drawing Sheets



U.S. PATENT DOCUMENTS

5,049,132 A	9/1991	Shaffer et al.		5,415,664 A	5/1995	Pinchuk	
5,108,416 A *	4/1992	Ryan et al.	606/194	5,441,515 A *	8/1995	Khosravi et al.	606/194
5,116,318 A	5/1992	Hillstead		5,445,646 A *	8/1995	Euteneuer et al.	606/198
5,158,548 A	10/1992	Lau et al.		5,447,497 A	9/1995	Sogard et al.	
5,226,880 A	7/1993	Martin		5,453,090 A	9/1995	Martinez et al.	
5,226,889 A	7/1993	Sheiban		5,458,615 A	10/1995	Klemm et al.	
5,242,399 A	9/1993	Lau et al.		5,470,313 A	11/1995	Crocker et al.	
4,733,665 C1	1/1994	Palmaz		5,507,768 A	4/1996	Lau et al.	
5,290,306 A	3/1994	Trotta et al.		5,512,051 A	4/1996	Wang et al.	
5,304,198 A *	4/1994	Samson	606/194	5,534,007 A	7/1996	St. Germain et al.	
5,342,305 A	8/1994	Shonk		5,536,252 A	7/1996	Imran et al.	
5,344,402 A	9/1994	Crocker		5,571,086 A *	11/1996	Kaplan et al.	604/96
5,344,426 A	9/1994	Lau et al.		5,571,089 A *	11/1996	Crocker	604/96
5,358,487 A	10/1994	Miller		5,591,228 A *	1/1997	Edoga	606/194
5,364,354 A *	11/1994	Walker et al.	604/96	5,632,760 A *	5/1997	Sheiban et al.	606/195
5,378,237 A	1/1995	Boussignac et al.		5,653,691 A *	8/1997	Rupp et al.	604/96
5,403,341 A	4/1995	Solar		5,817,102 A	10/1998	Johnson et al.	606/108
5,405,380 A	4/1995	Gianotti et al.		5,846,246 A *	12/1998	Dirks et al.	606/108
5,409,495 A *	4/1995	Osborn	606/108				

* cited by examiner

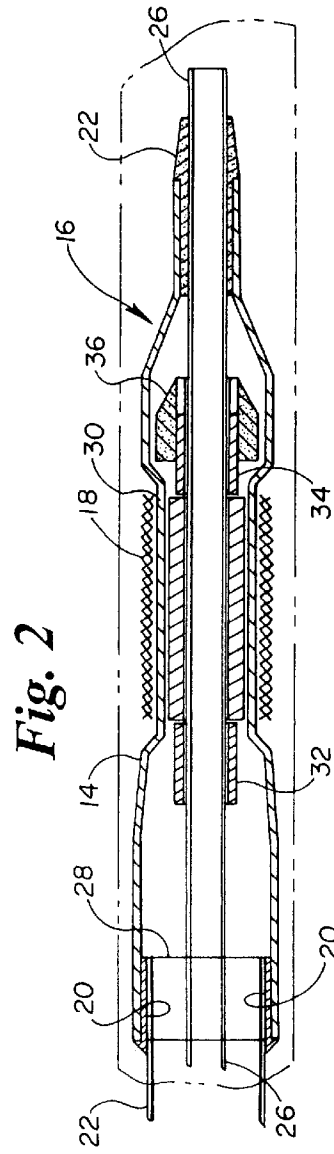
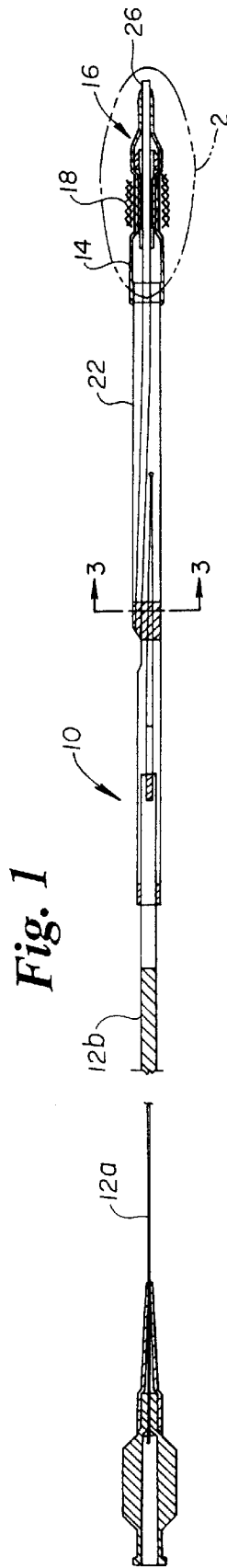


Fig. 3

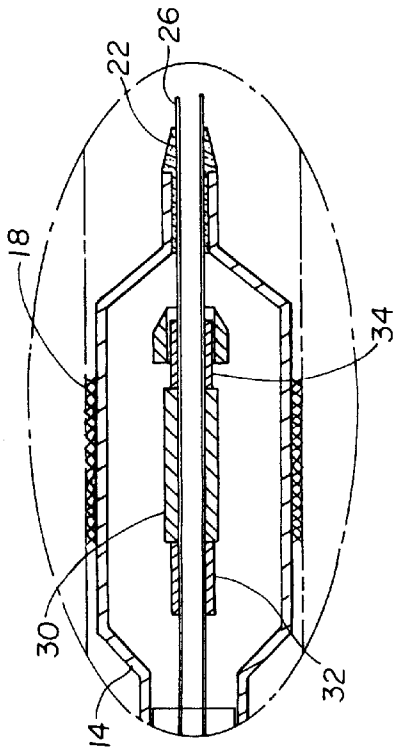


Fig. 4

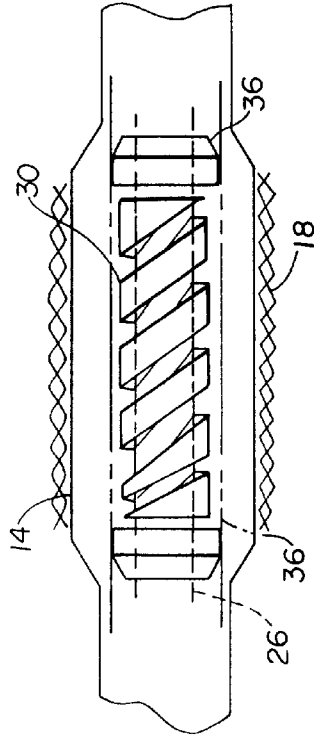


Fig. 6

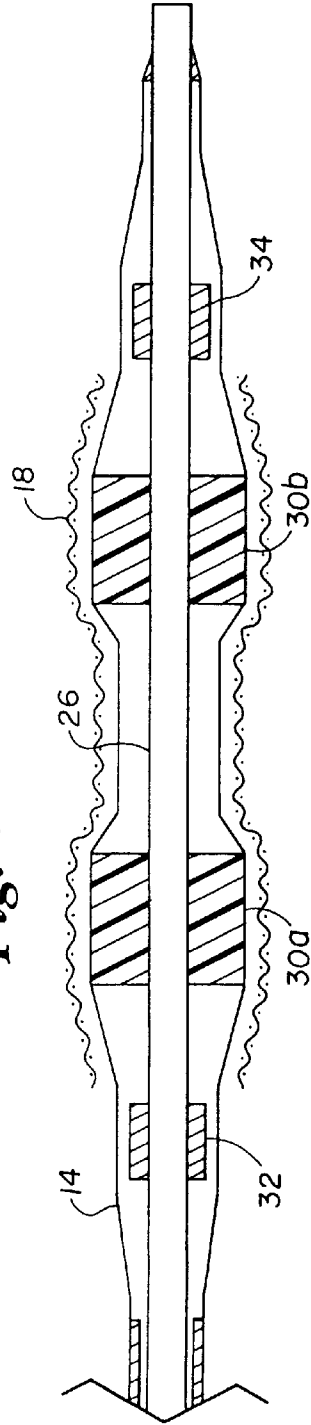
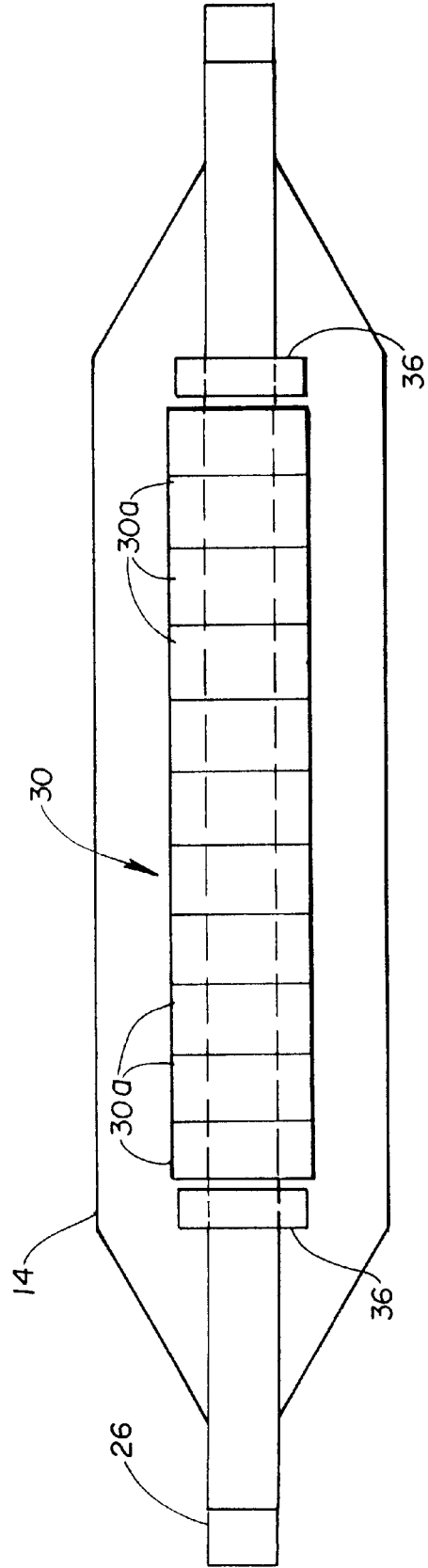


Fig. 5



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