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Steinke et al.

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[54] CATHETER WITH FLEXIBLE SIDE PORT ENTRY

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[51] Int. Cl.⁵ **A61M 29/00**

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[58] Field of Search **604/96, 102, 280, 282; 128/656-658, 772; 606/191, 192, 194**

[56] References Cited

U.S. PATENT DOCUMENTS

4,594,074	6/1986	Anderson et al.	604/270
4,648,384	3/1987	Schmukler	128/1
4,723,936	2/1988	Buchbinder et al.	604/95
4,748,982	6/1988	Horzewski et al.	128/344
4,762,129	8/1988	Bonzel	128/344
4,771,777	9/1988	Horzewski et al.	128/344
4,790,315	12/1988	Mueller, Jr. et al.	128/344
4,804,358	2/1989	Karcher et al.	600/17
4,832,028	5/1989	Patel	128/344
4,838,268	6/1989	Keith et al.	128/344
4,877,031	10/1989	Conway et al.	128/344
4,892,519	1/1990	Songer et al.	604/96
4,909,252	3/1990	Goldberger	606/194
4,917,666	4/1990	Solar et al.	604/95
4,927,413	5/1990	Hess	604/95
4,943,278	7/1990	Euteneuer et al.	604/96
4,944,740	7/1990	Buchbinder et al.	606/194

4,944,745	7/1990	Sogard et al.	606/194
4,976,689	12/1990	Buchbinder et al.	604/95
4,988,356	1/1991	Crittenden et al.	606/192
5,000,753	3/1991	Hagen et al.	606/32
5,040,548	8/1991	Yock	128/898
5,061,273	10/1991	Yock	606/194
5,125,895	6/1992	Buchbinder et al.	604/95
5,154,725	10/1992	Leopold	606/194
5,156,594	10/1992	Keith	604/96

FOREIGN PATENT DOCUMENTS

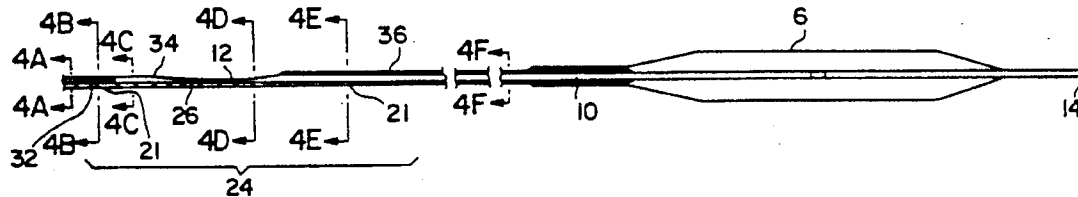
0420486	3/1991	European Pat. Off.	A61M 29/02
8803389	5/1988	PCT Int'l Appl.	A61B 10/00
9108013	6/1991	PCT Int'l Appl.	A61M 25/10

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[57] ABSTRACT

An improved balloon catheter is disclosed which is comprised of two jacketed spring coils placed end-to-end and joined by a linking element which contains a lumen communicating between the inflation lumens formed by the two spring coils. A side port entry to a guidewire lumen, which extends through the distal coil to the distal end of the catheter, is located in the transition region formed by the linking element. The linking element may include two polyimide tubes or may be a multilumen insert. The catheter is stiffened by a core wire which is bonded directly to the spring coils. A catheter comprised of a single spring coil with a side port entry in the coil is also disclosed, and a method and apparatus for crimping the coil to create the entry.

12 Claims, 7 Drawing Sheets



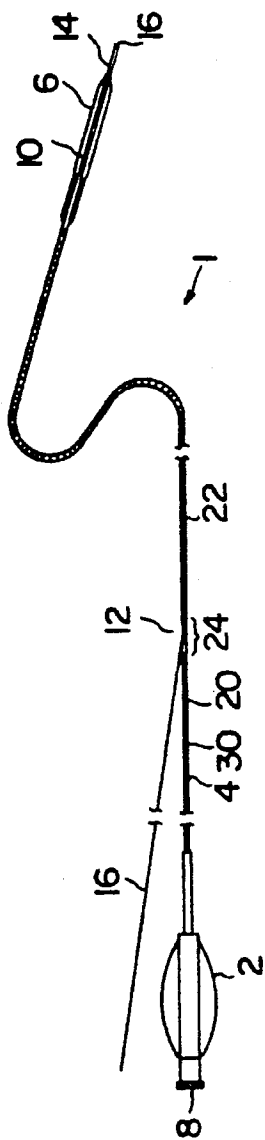


FIG. 1

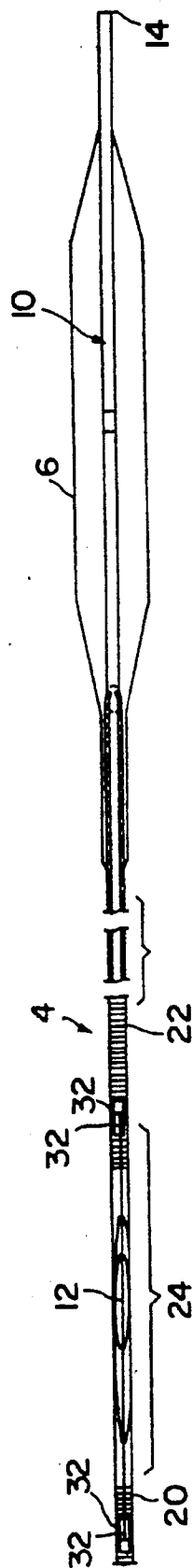
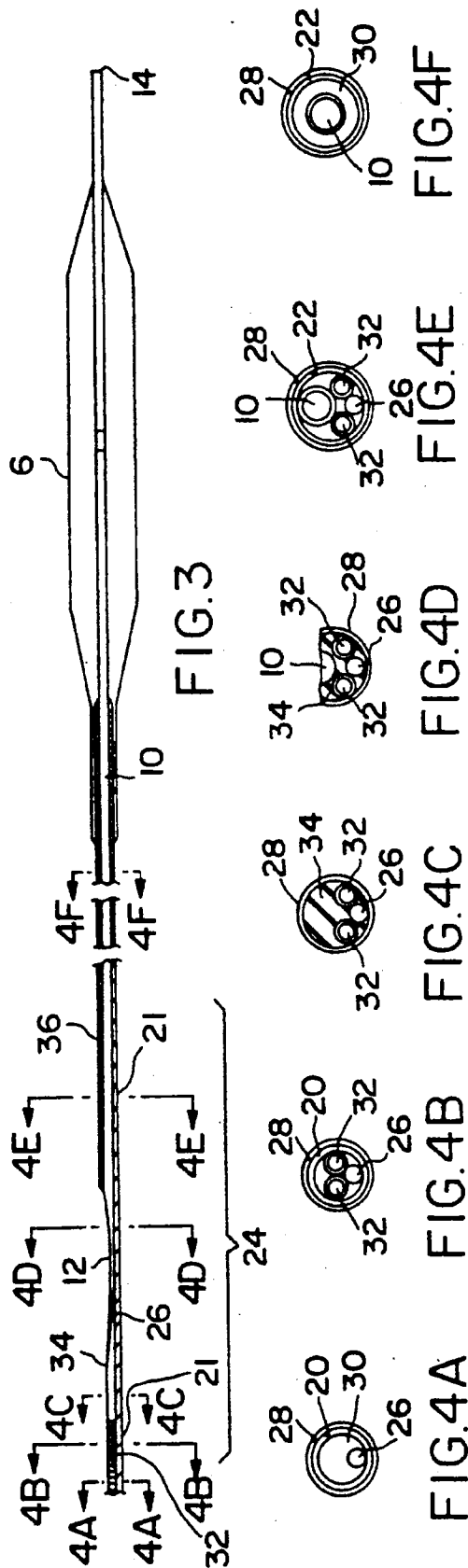
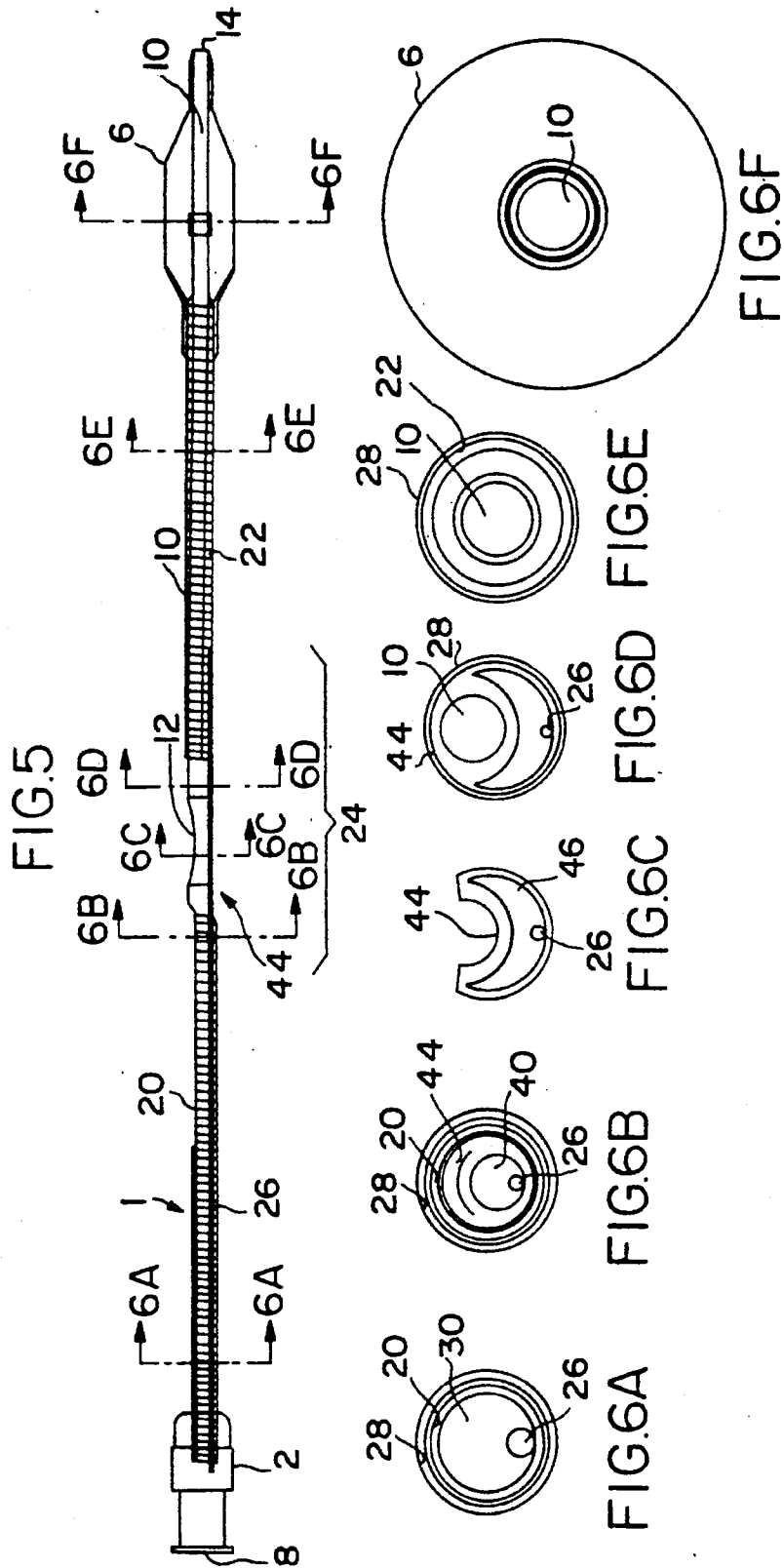
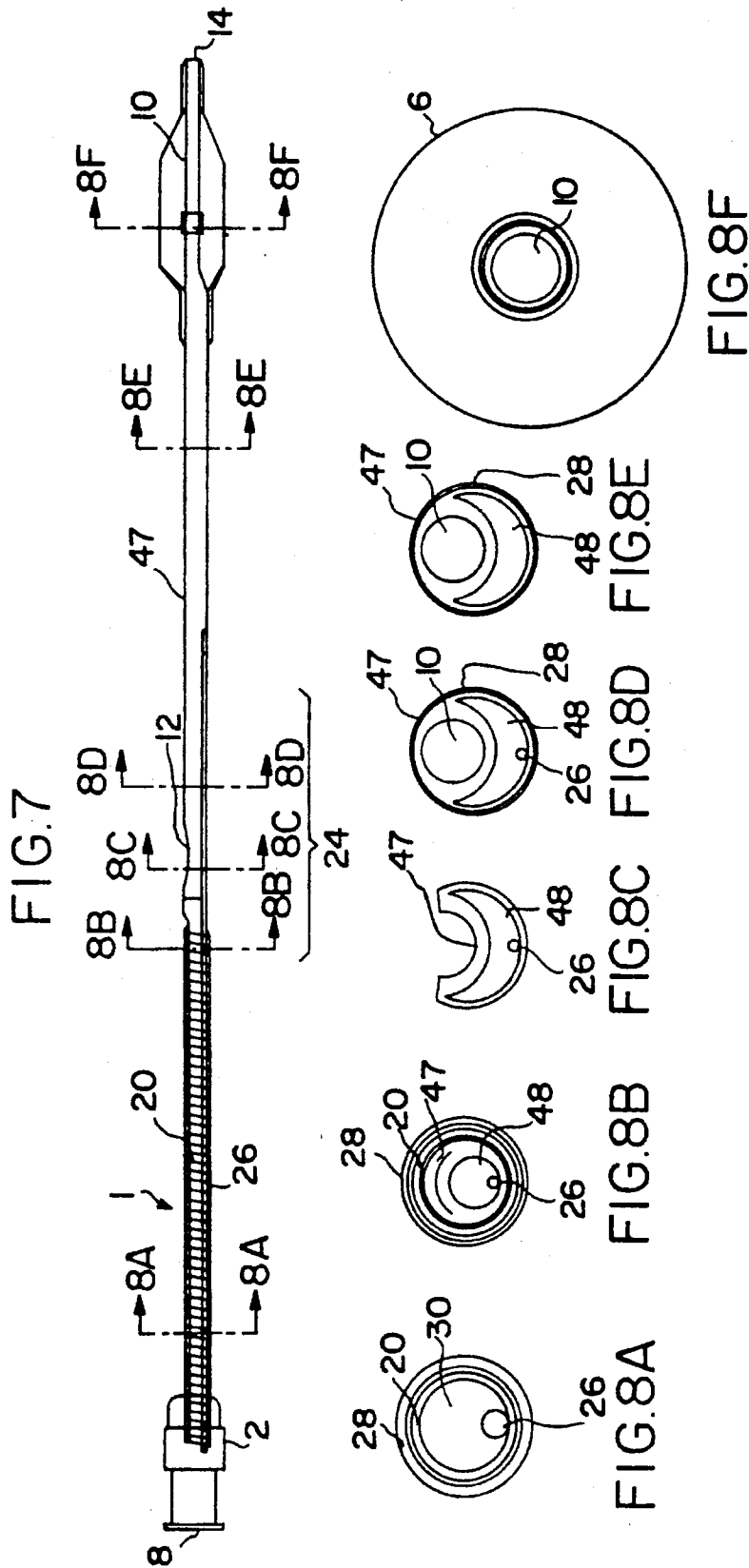


FIG. 2







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