



US007892201B1

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

(10) **Patent No.:** **US 7,892,201 B1**  
(45) **Date of Patent:** **Feb. 22, 2011**

(54) **BALLOON CATHETER AND METHOD OF MOUNTING SAME**

(75) Inventors: **Alvaro J. Laguna**, Flagstaff, AZ (US);  
**Carey V. Campbell**, Flagstaff, AZ (US)

(73) Assignee: **Gore Enterprise Holdings, Inc.**,  
Newark, DE (US)

(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 1826 days.

(21) Appl. No.: **09/384,900**

(22) Filed: **Aug. 27, 1999**

(51) **Int. Cl.**  
**A61M 29/00** (2006.01)

(52) **U.S. Cl.** ..... **604/96.01**

(58) **Field of Classification Search** ..... 604/96.01,  
604/103, 103.05, 103.06, 103.09, 103.11,  
604/103.12, 912, 915

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

1,690,995 A	11/1928	Pratt
3,953,566 A	4/1976	Gore
4,003,382 A	1/1977	Dyke
4,106,509 A	8/1978	McWhorter
4,187,390 A	2/1980	Gore
4,194,041 A	3/1980	Gore et al.
4,279,245 A	7/1981	Takagi et al.
4,304,010 A	12/1981	Mano
4,327,736 A	5/1982	Inoue
4,338,942 A	7/1982	Fogarty
4,403,612 A	9/1983	Fogarty
4,443,511 A	4/1984	Worden et al.
4,490,421 A	12/1984	Levy
4,573,966 A	3/1986	Weigl et al.
4,608,984 A	9/1986	Fogarty
4,613,544 A	9/1986	Burleigh
4,619,641 A	10/1986	Schanzer
4,637,396 A	1/1987	Cook

4,650,466 A	3/1987	Luther
4,702,252 A	10/1987	Brooks et al.
4,706,670 A	11/1987	Andersen et al.
4,713,070 A	12/1987	Mano
4,737,219 A	4/1988	Taller et al.
4,764,560 A	8/1988	Mitchell
4,816,339 A	3/1989	Tu et al.
4,819,751 A	4/1989	Shimada et al.
4,832,688 A	5/1989	Sagae et al.

(Continued)

FOREIGN PATENT DOCUMENTS

EP	372088	6/1990
----	--------	--------

(Continued)

OTHER PUBLICATIONS

Dillon M E, Silicone and Poly(tetrafluoroethylene) Interpenetrating Polymer Networks. 1994 American Chemical Society.

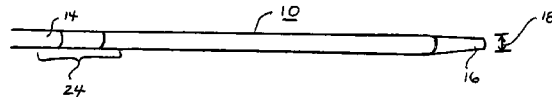
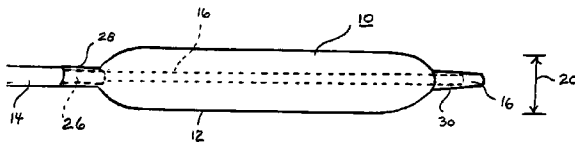
*Primary Examiner*—Manuel A Mendez

(74) *Attorney, Agent, or Firm*—David J. Johns

(57) **ABSTRACT**

The present invention provides improved methods for forming and mounting a sleeve on a catheter shaft in order to form a distensible balloon catheter. The balloon is formed from a distensible sleeve that is treated to render one or both of its ends essentially non-distensible. The balloon is mounted on the catheter shaft by the non-distensible ends, without compromising the distensible operative portion of the balloon. The balloon may also be mounted using non-distensible tape or similar means to achieve a similar result.

**19 Claims, 5 Drawing Sheets**



**EDWARDS LIFESCIENCES EX. 1019**

U.S. PATENT DOCUMENTS			FOREIGN PATENT DOCUMENTS		
4,896,669 A	1/1990	Bhate et al.	5,470,313 A	11/1995	Crocker et al.
4,946,464 A	8/1990	Pevsner	5,478,320 A	12/1995	Trotta
4,955,899 A	9/1990	Del Corna et al.	5,490,839 A	2/1996	Wang et al.
5,066,298 A	11/1991	Hess ..... 606/194	5,496,276 A	3/1996	Wang et al.
5,071,609 A	12/1991	Tu et al.	5,498,238 A	3/1996	Shapland et al.
5,087,244 A	2/1992	Wolinsky et al.	5,499,973 A	3/1996	Saab
5,112,304 A	5/1992	Barlow et al.	5,499,980 A	3/1996	Euteneuer
5,116,318 A	5/1992	Hillstead	5,499,995 A	3/1996	Teristein
5,137,512 A	8/1992	Burns et al.	5,500,180 A	3/1996	Anderson et al.
5,152,782 A	10/1992	Kowligi et al.	5,500,181 A	3/1996	Wang et al.
5,171,297 A	12/1992	Barlow et al.	5,512,051 A	4/1996	Wang et al.
5,192,296 A	3/1993	Bhate et al.	5,519,172 A	5/1996	Spencer et al.
5,201,706 A	4/1993	Noguchi et al.	5,527,282 A	6/1996	Segal
5,211,654 A	5/1993	Kaltenbach	5,529,820 A	6/1996	Nomi et al.
5,213,576 A	5/1993	Abiuso et al.	5,609,605 A	3/1997	Marshall et al.
5,226,880 A	7/1993	Martin	5,613,979 A	3/1997	Trotta et al.
5,236,659 A	8/1993	Pinchuk et al.	5,620,649 A	4/1997	Trotta
5,254,090 A	10/1993	Lombardi et al.	5,641,373 A	6/1997	Shannon et al.
5,256,143 A	10/1993	Miller et al.	5,718,680 A *	2/1998	Kraus et al. .... 604/509
5,286,254 A	2/1994	Shapland et al.	5,728,066 A *	3/1998	Daneshvar ..... 604/96.01
5,290,306 A	3/1994	Trotta et al.	5,766,201 A *	6/1998	Ravenscroft et al. .... 606/194
5,330,429 A	7/1994	Noguchi et al.	5,843,116 A *	12/1998	Crocker et al. .... 606/192
5,338,299 A	8/1994	Barlow	5,868,704 A	2/1999	Campbell et al. .... 604/96
5,342,305 A	8/1994	Shonk	5,919,163 A *	7/1999	Glickman ..... 604/101.05
5,348,538 A	9/1994	Wang et al.	6,139,570 A *	10/2000	Saadat et al. .... 607/105
5,358,486 A	10/1994	Saab	6,312,405 B1 *	11/2001	Meyer et al. .... 604/96.01
5,358,516 A	10/1994	Myers et al.			
5,366,472 A	11/1994	Hillstead	EP	0 540 858	5/1993
5,370,618 A	12/1994	Leonhardt	GB	1566674	5/1980
5,403,340 A	4/1995	Wang et al.	WO	90/14054	11/1990
5,411,479 A *	5/1995	Bodden ..... 604/101.03	WO	94/02185	2/1994
5,415,636 A	5/1995	Forman	WO	95/05555	2/1995
5,425,710 A	6/1995	Khair et al.	WO	96/14895	5/1996
5,429,605 A	7/1995	Bernd et al.	WO	97/02791	1/1997
5,456,661 A	10/1995	Narciso, Jr.	WO	99/02212	1/1999
5,458,568 A	10/1995	Racchini et al.			
5,466,252 A	11/1995	Soukup et al.			

\* cited by examiner

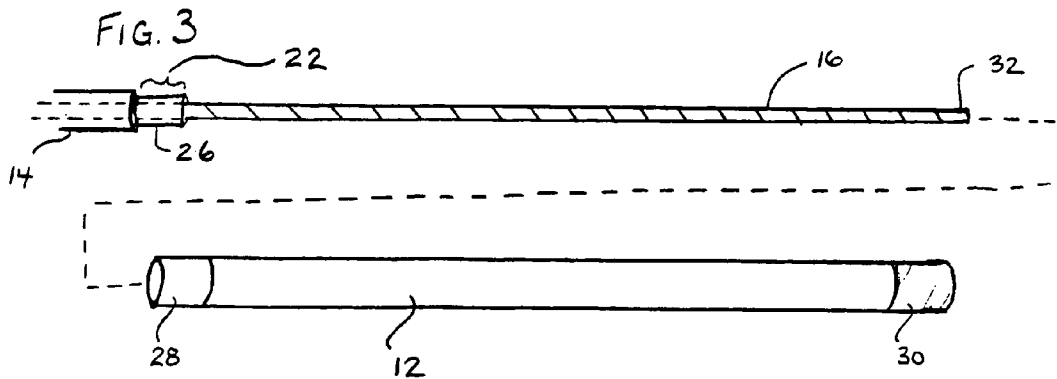
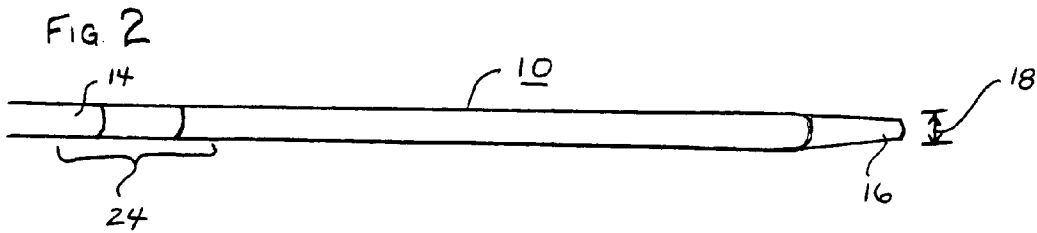
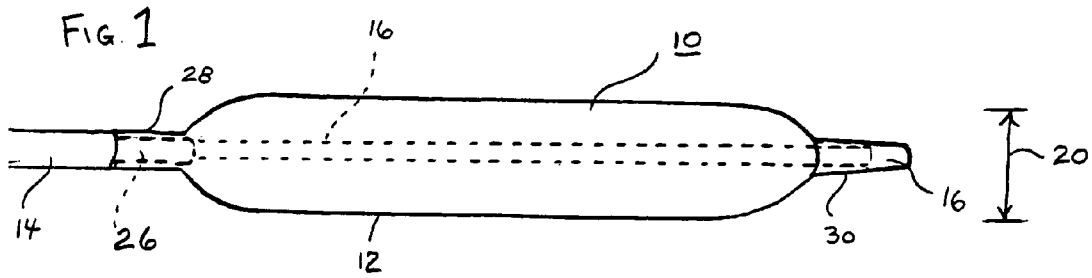


FIG. 4

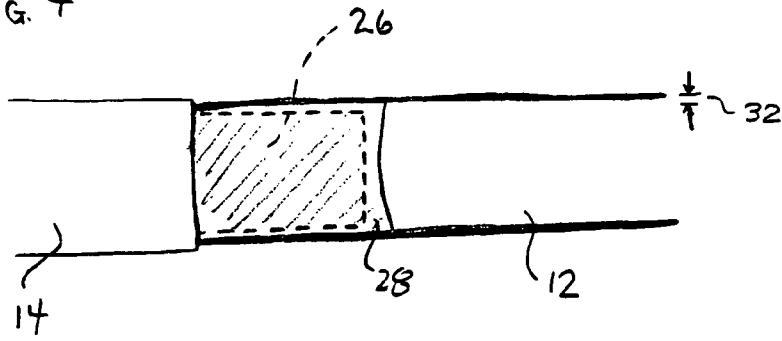


FIG. 5

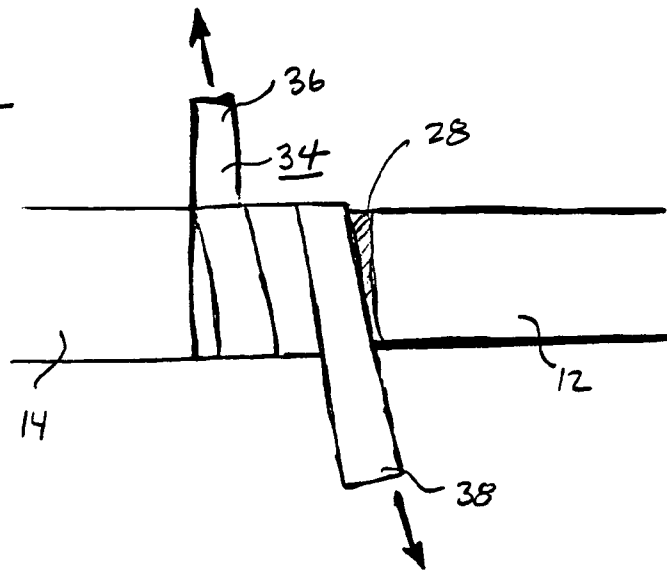


FIG. 6

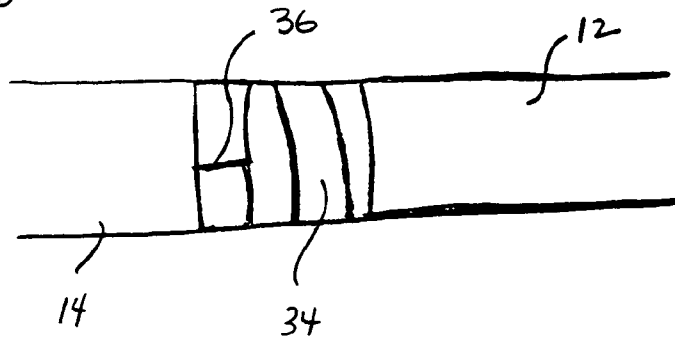


FIG. 7

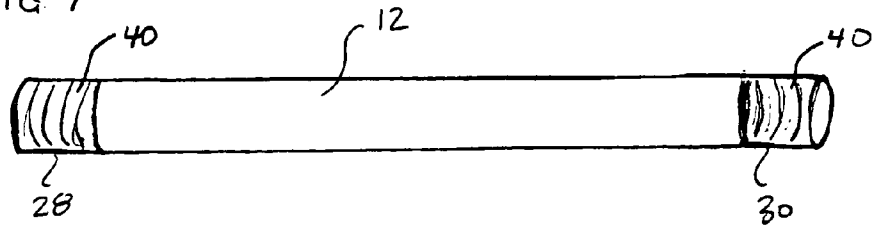


FIG. 8

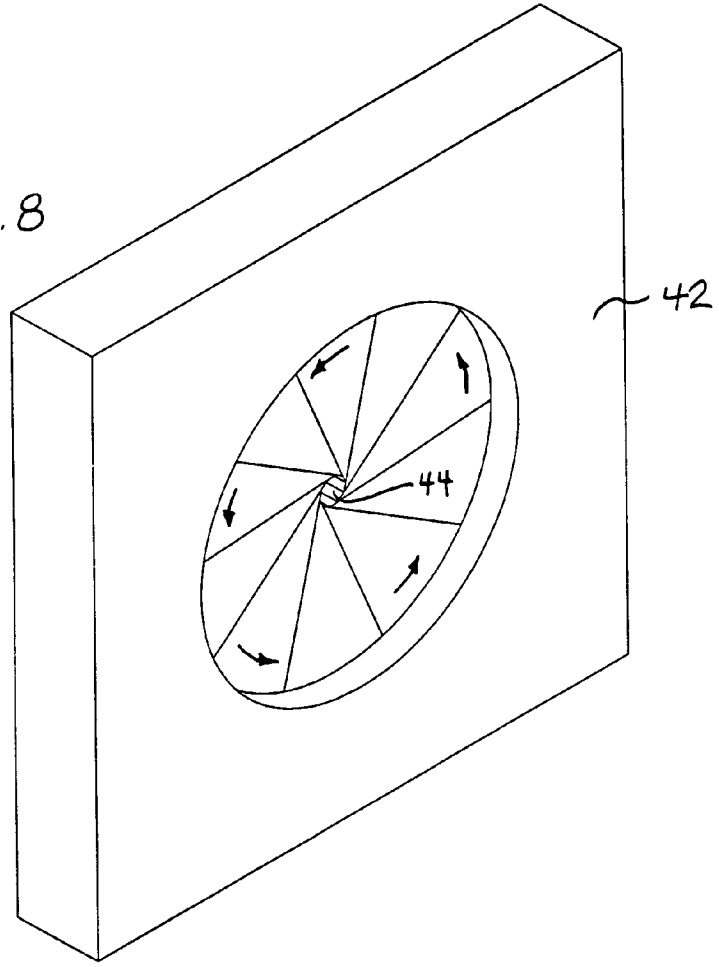
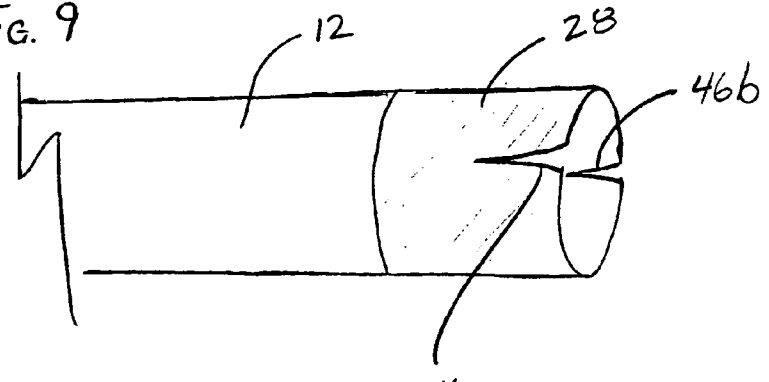


FIG. 9



# Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

## Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

## Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

## Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

## API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

## LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

## FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

## E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.