

[54] **INTRAVASCULAR DEVICE FOR CORONARY HEART TREATMENT**

0277366 8/1988 European Pat. Off. .  
 0282143 9/1988 European Pat. Off. .  
 0397357 11/1990 European Pat. Off. .  
 0627828 8/1978 U.S.S.R. .

[75] Inventors: **Daniel O. Adams**, Orono; **Scott P. Thome**, Waite Park, both of Minn.

OTHER PUBLICATIONS

[73] Assignee: **SciMed Life Systems, Inc.**, Maple Grove, Minn.

A Technique For Exchanging A Clotted Intravascular Catheter Using The Original Arteriopuncture Site—M. Leon Skolnick, M.D., Syracuse, New York.

[21] Appl. No.: **303,590**

“Replacing the Occluded Percutaneous Nephrostomy Catheter”, *Radiology*, p. 824, Dec. 1981, Baron et al.

[22] Filed: **Sep. 9, 1994**

“Spiral Exchange Cannula for the Occluded Drainage Catheter”, *Radiology*, pp. 543-544, Nov. 1985. McCain et al.

**Related U.S. Application Data**

[63] Continuation of Ser. No. 874,079, Apr. 24, 1992, abandoned, which is a continuation-in-part of Ser. No. 605,398, Oct. 29, 1990, abandoned.

“An Alternate Method for Repair of a Leaking Arterial Chemotherapy Infusion Catheter”, *Journal of Surgical Oncology*, pp. 27-28, 1987. Burkhalter et al.

[51] **Int. Cl.<sup>6</sup>** ..... **A61M 5/00**

Schneider, Inc., Product Brochure for Monorail® GEX™, Copright Oct. 1990.

[52] **U.S. Cl.** ..... **604/171; 604/264; 604/280; 604/96; 604/164; 128/772**

USCI, Product Brochure for Probing Catheter.

[58] **Field of Search** ..... **604/162, 163, 604/160, 158, 159, 161, 166, 282, 283, 93, 96, 100, 164, 171, 264, 280, 281, 284; 128/657, 658, 772; 606/108, 119, 121**

Cordis Corp., Product Brochure for The Cordis Shuttle™ Catheter (2 pages), Copyright Dec. 1990.

*Primary Examiner*—Corrine M. Maglione  
*Assistant Examiner*—Ronald K. Stright, Jr.  
*Attorney, Agent, or Firm*—Kinney & Lange

[56] **References Cited**

[57] **ABSTRACT**

**U.S. PATENT DOCUMENTS**

An intravascular device having an elongated flexible tube sized for insertion into a coronary vessel beyond a distal end of a guide catheter. In use, the flexible tube has its proximal end within a guide catheter and has its distal end extending to a treatment site in a coronary artery. The device also including a push rod attached to a proximal end of the flexible tube to facilitate placement of the flexible tube within the coronary artery requiring treatment. In certain applications, the intravascular device is used as a drug (or other fluid) delivery device or as an aspiration device. In other applications, the intravascular device is used as a guiding means for placement of an angioplasty device, such as a guide wire or a balloon catheter. Additionally, an attachment tube may be provided which is designed to couple with a proximal end of the flexible tube to provide a continuous conduit for aspiration or fluid delivery to a treatment site in a coronary artery.

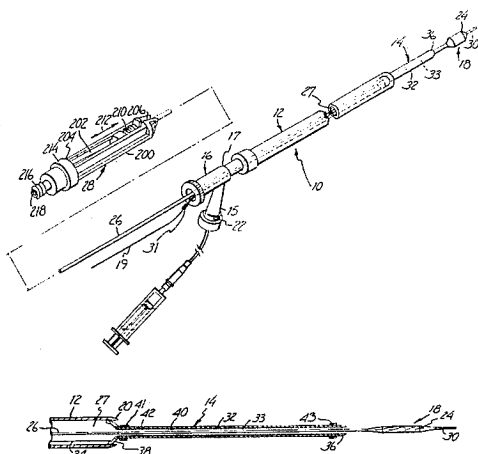
2,657,691	11/1953	Nordstrom, Jr. ....	606/108
3,262,449	7/1966	Pannier .	
3,297,030	1/1967	Czorny et al. .	
3,550,591	12/1970	MacGregor .	
3,559,643	2/1971	Pannier et al. .	
3,682,173	8/1972	Center .	
3,777,743	12/1973	Binard et al. ....	606/119
3,877,429	4/1975	Rasumoff ..... ..	604/158
4,000,743	1/1977	Weaver ..... ..	606/119
4,187,848	2/1980	Taylor .	
4,198,981	4/1980	Sinnreich ..... ..	606/119

(List continued on next page.)

**FOREIGN PATENT DOCUMENTS**

0628292	10/1961	Canada .
0002607	6/1979	European Pat. Off. .
0231601	8/1987	European Pat. Off. .

**41 Claims, 10 Drawing Sheets**



U.S. PATENT DOCUMENTS					
		4,842,590	6/1989	Tanabe et al. ....	604/282
		4,858,810	8/1989	Intekofer et al. .	
		4,863,439	9/1989	Sanderson .....	604/93
		4,886,500	12/1989	Lazarus .....	128/772
		4,905,667	3/1990	Foerster et al. .	
		4,909,258	3/1990	Kuntz et al. .	
		4,929,236	5/1990	Sampson .	
		4,932,413	6/1990	Shockey et al. .	
		4,944,740	7/1990	Buchbinder et al. .	
		4,947,864	8/1990	Shockey et al. .	
		4,969,890	11/1990	Sugita et al. .	
		4,976,689	12/1990	Buchbinder et al. .	
		4,988,356	1/1991	Crittenden et al. .	
		4,994,027	2/1991	Farrell .	
		4,998,923	3/1991	Sampson et al. .	
		5,002,559	3/1991	Tower .....	128/772
		5,035,686	7/1991	Crittenden et al. .	
		5,078,702	1/1992	Pomeranz .....	604/282
		5,120,323	6/1992	Shockey et al. ....	604/282
		5,135,535	8/1992	Kramer .....	604/194
		5,147,377	9/1992	Sahota .....	128/772
		5,178,608	1/1993	Winters .....	604/101
4,345,596	8/1982	Young .			
4,354,491	10/1982	Marbry .			
4,369,790	1/1983	McCarthy .....	604/280		
4,412,832	11/1983	Kling et al. .			
4,449,532	5/1984	Storz .			
4,534,363	8/1985	Gold .....	128/772		
4,581,017	4/1986	Sahota .			
4,581,019	4/1986	Curelaru et al. .			
4,581,025	4/1986	Timmermans .			
4,616,652	10/1986	Simpson .			
4,619,644	10/1986	Scott .			
4,631,059	12/1986	Wolvek et al. .			
4,687,469	10/1987	Osypka .			
4,696,667	9/1987	Masch .....	604/53		
4,723,948	2/1988	Clark et al. ....	604/283		
4,726,369	2/1988	Mar .			
4,747,833	5/1988	Kousai et al. .			
4,748,982	6/1988	Horzewski et al. .			
4,771,777	9/1988	Horzewski et al. .			
4,801,294	1/1989	Okada .			
4,827,941	5/1989	Taylor et al. .			

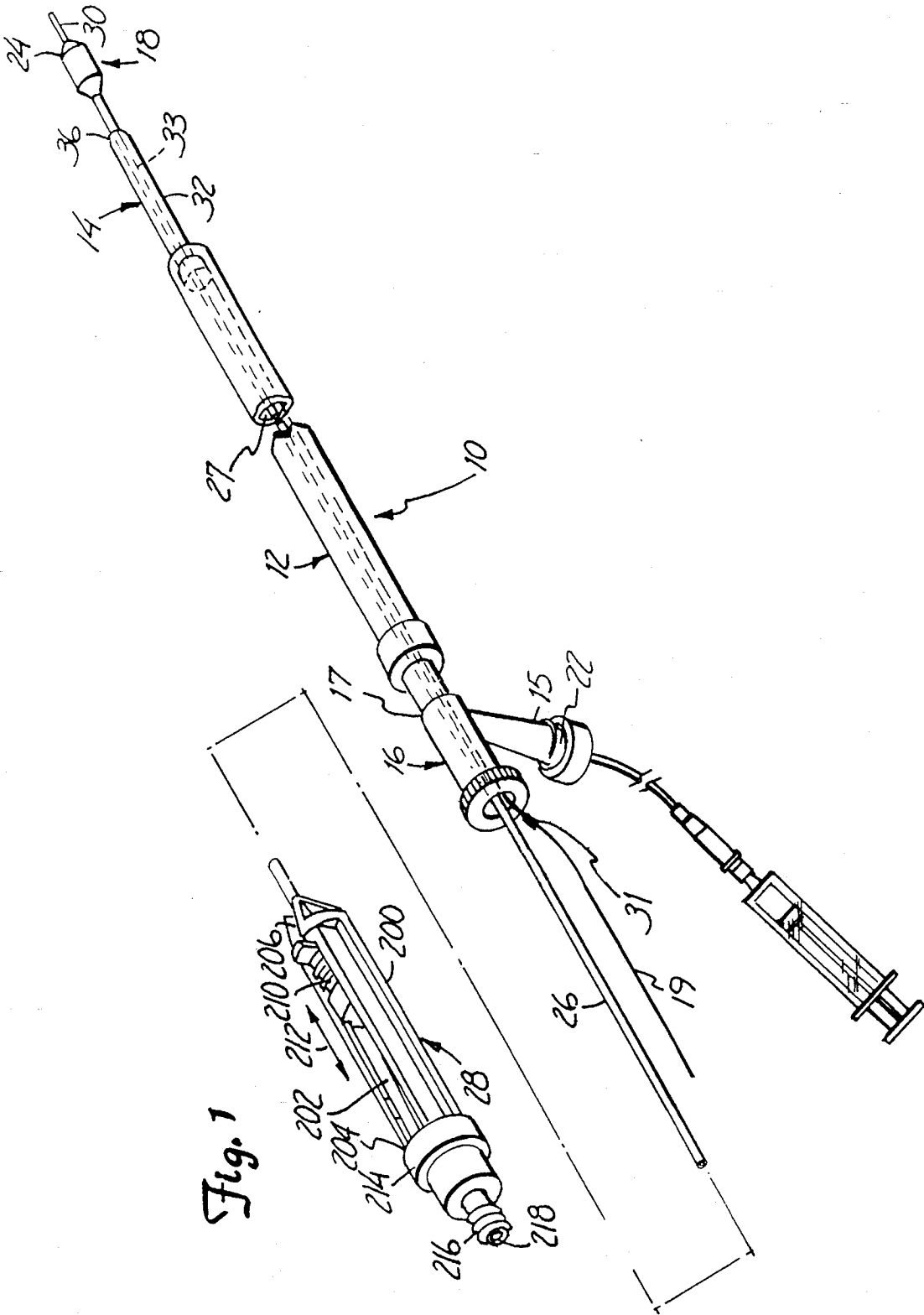


Fig. 1

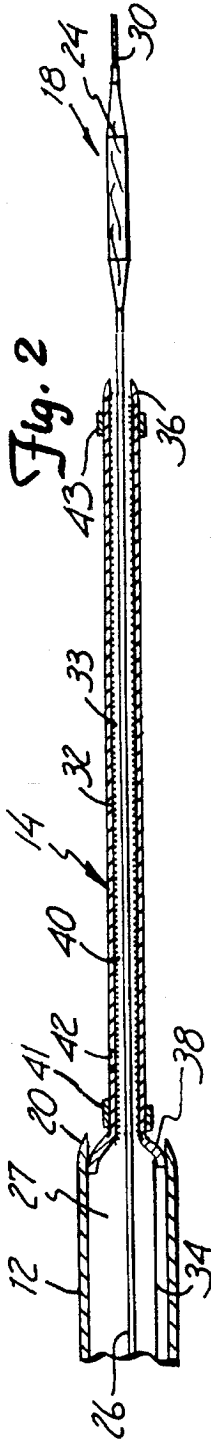


Fig. 2

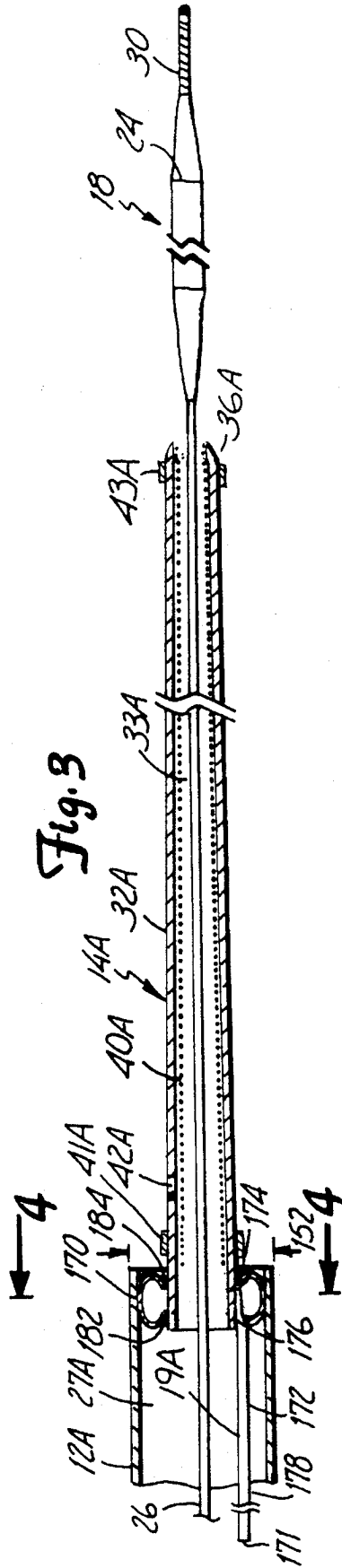


Fig. 3

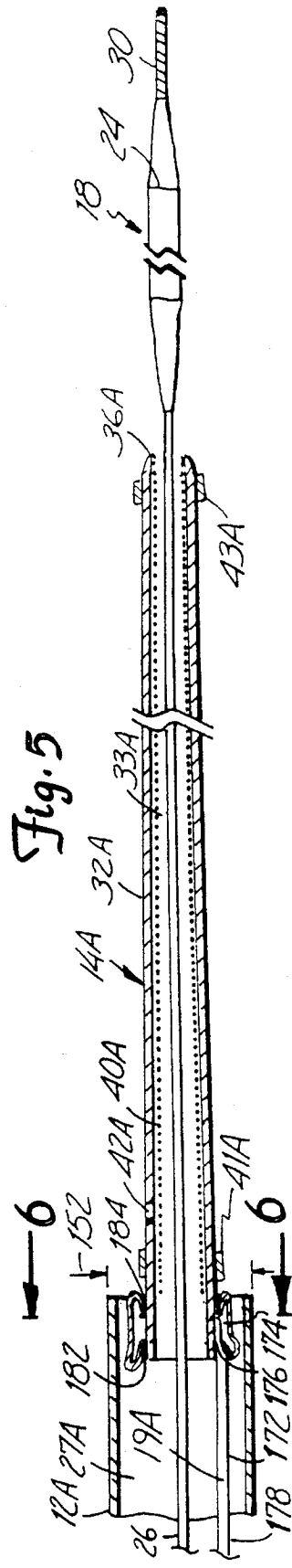


Fig. 5

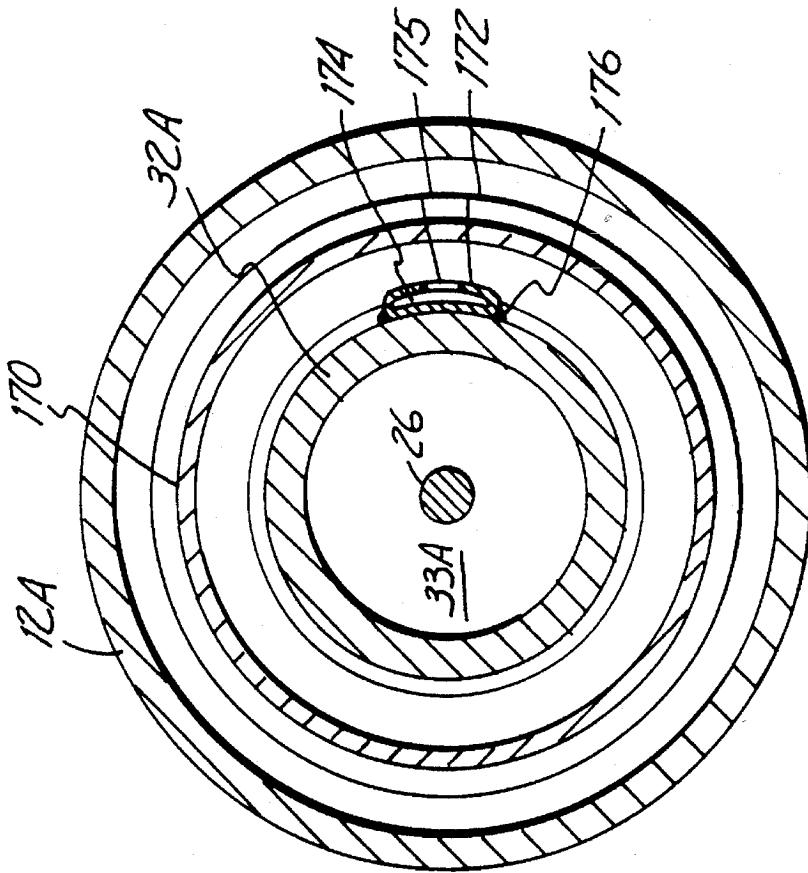


Fig. 6

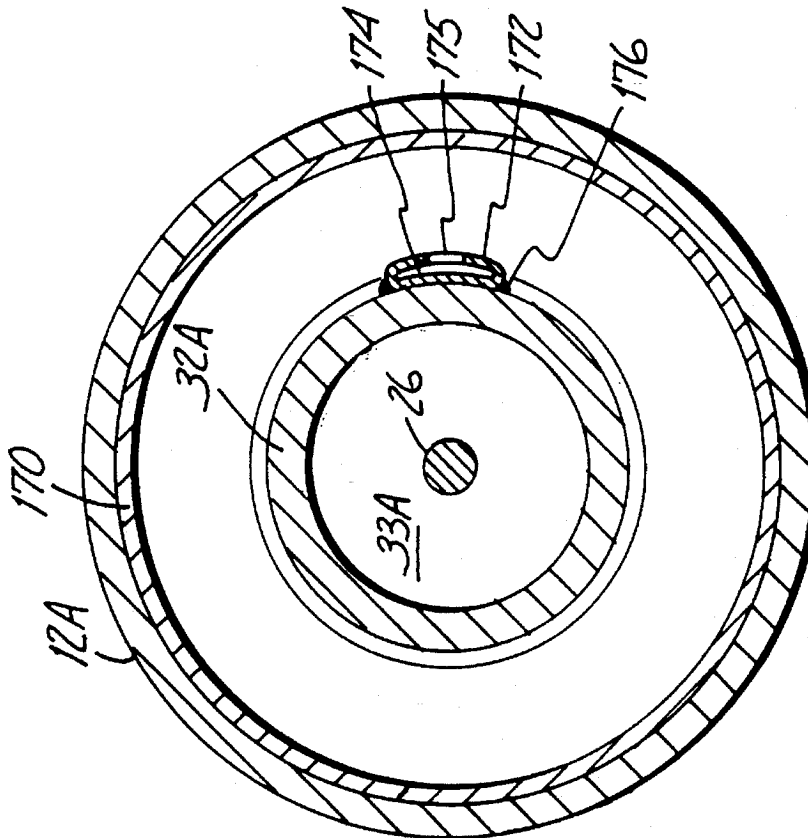


Fig. 4

# 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.