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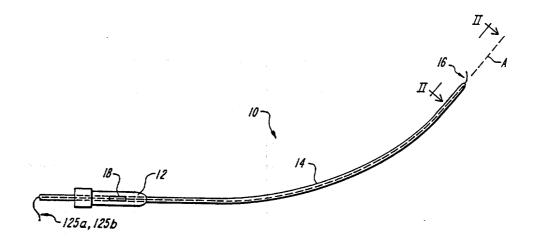
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Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.

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(54) Title: REMOTELY STEERED CATHETERIZATION DEVICE



(57) Abstract

A remotely steerable guide wire, catheter or insertable active implement (10) is disclosed. A steerable guide wire or a catheter for coronary and peripheral catheterizations is illustrated, using electro-strictive or piezoelectric material for controlling its motions inside the body via control inputs (18) applied from outside the body. A steerable portion of the device, which may be either an active flexible tip (16) or an active region (14) along the length of the implement, controls the tip position or modifies stiffness along a region of the tip. In one embodiment, manipulation of electrical control inputs permits deflection of the steerable region through a range of motion about the axis of the implement in a single plane. In further embodiments the tip may deflect in multiple planes about its longitudinal axis, or the device may be selectively stiffened to assume an arc shape or to firmly lodge the tip in position in a vessel.

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GA	Gaboli				

International application No.
PCT/US94/08456

A. CLASSIFICATION OF SUBJECT MATTER IPC(6) :A61M 37/00 US CL :604/95							
According to International Patent Classification (IPC) or to both national classification and IPC							
B. FIELDS SEA							
	tion searched (classification system followed						
U.S. : 29/29.34;	128/657, 772; 310/311/ 361/225; 604/5	3, 95, 281					
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched NONE							
	consulted during the international search (na	me of data base and, where practicable,	search terms used)				
APS Searched: catheter, guide wire, piezoelectric, electrical conductor, strain element, steering, actuator, polymer.							
C. DOCUMENT	S CONSIDERED TO BE RELEVANT						
Category* Cita	tion of document, with indication, where ap	propriate, of the relevant passages	Relevant to claim No.				
	A, 5,281,213 (MILDER ET line 56 of column 4 through	1-3, 6, 11, 12, 15, 17-19					
strair	US, A, 4,799,474 (UEDA) 24 January 1989. Note the strain element means (44A) and (44B) that are connected to the electrical conduction means (32)(34).						
Y the e							
strair	A, 4,944,727 (MCCOY) (n element means (20) that rical conduction means (40).	1-3, 11, 13-15, 17, 19 20-23					
X Further docum	nents are listed in the continuation of Box C	. See patent family annex.					
Special categories of cited documents: 'A' document defining the general state of the art which is not considered		"T" later document published after the inte date and not in conflict with the applica principle or theory underlying the inv	ation but cited to understand the				
	articular relevance rat published on or after the international filing date	"X" document of particular relevance; th	e claimed invention cannot be				
"L" document which	th may throw doubts on priority claim(s) or which is ish the publication date of another citation or other	considered novel or cannot be considered to involve an inventive step when the document is taken alone					
special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means		"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art					
		& document member of the same patent family					
Date of the actual completion of the international search Date of mailing of the international search report							
07 MARCH 1995		20 MAR 1995					
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT		Authorized officer Hacia Sincik BRYAN L. TSOSIE					
Washington, D.C. 20231 Executive No. (703) 305-3230		Telephone No. (703) 308-3175	704				

International application No.
PCT/US94/08456

C (Continual	tion). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant	ant passages	Relevant to claim No.
х	US, A, 4,984,581 (STICE) 15 January 1991. Note element means (12) and electrical conduction means (3	1-3, 11, 15, 17, 19	

International application No. PCT/US94/08456

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)				
This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:				
1. Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:				
2. Claims Nos.: because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:				
3. Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).				
Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)				
This International Searching Authority found multiple inventions in this international application, as follows:				
Please See Extra Sheet.				
1. X As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.				
2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.				
3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:				
4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:				
Remark on Protest The additional search fees were accompanied by the applicant's protest. X No protest accompanied the payment of additional search fees.				

International application No. PCT/US94/08456

BOX II. OBSET ATIONS WHERE UNITY OF INVENTION WAS LACKING This ISA found multiple inventions as follows:					
Group I, claims 1-19, drawn to an apparatus.					
Group II, claims 20-23, drawn to a method of making a component of the apparatus.					
Groups I and II do not relate to a single inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reason:					
Group I, the component of this group could be made by any known method, and it is clearly not limited to the method of Group II.					

Form PCT/ISA/210 (extra shees)(July 1992)*