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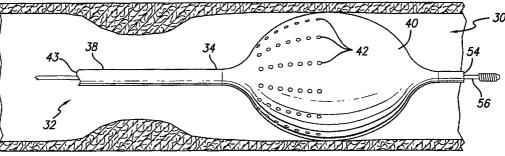
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(54) Title: EMBOLI PROTECTION SYSTEM



(57) Abstract: The emboli protection system provides one or more inflatable blocking ballons for isolation of a section of a blood vessel to prevent migration of emboli from the section during an interventional procedure, and fluid infusion and evacuation ports for flushing emboli from the isolated section. One embodiment provides for a distal blocking balloon catheter, over which an interventional device can be introduced, and a proximal blocking balloon catheter to be introduced over the interventional device for isolating a portion of a blood vessel to be treated. The blocking balloons can be perforated to provide the infusion ports, and thrombolytic inflation fluid may be used to break down and dissolve thrombus and plaque in the isolated portion of the blood vessel. The interventional therapeutic device such as an angioplasty balloon catheter may be incorporated into the distal blocking balloon catheter, or the distal and blocking proximal balloon catheters can be incorporated with the interventional therapeutic device together in one device. Infusion ports may also be provided in either or both of the distal and proximal blocking catheters.

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IN RNATIONAL SEARCH REPORT

onal Application No PCT/US 01/08183

A. CLASSIFICATION OF SUBJECT MATTER IPC 7 A61F2/01 A61M25/10

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

 $\label{eq:minimum} \begin{array}{ll} \text{Minimum documentation searched (classification system followed by classification symbols)} \\ \text{IPC 7} & \text{A61F} & \text{A61M} \end{array}$

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ, WPI Data

IENTS CONSIDERED TO BE RELEVANT			
Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.		
WO 99 40964 A (FRID NOUREDDINE ;RUFENACHT DANIEL (CH); MEDICORP SA (FR); AMOR MAX) 19 August 1999 (1999-08-19) the whole document	1-10, 17-24		
WO 99 08744 A (SHAKNOVICH ALEXANDER) 25 February 1999 (1999-02-25) the whole document	1-10, 17-24		
US 5 728 068 A (WEISSINGER KARL PHILLIP ET AL) 17 March 1998 (1998-03-17) claim 1; figures	1,8,17, 22		
-/			
[/_]	ers are listed in annex.		
ent defining the general state of the art which is not dered to be of particular relevance invention document but published on or after the international "X" document of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "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		
	WO 99 40964 A (FRID NOUREDDINE; RUFENACHT DANIEL (CH); MEDICORP SA (FR); AMOR MAX) 19 August 1999 (1999-08-19) the whole document WO 99 08744 A (SHAKNOVICH ALEXANDER) 25 February 1999 (1999-02-25) the whole document US 5 728 068 A (WEISSINGER KARL PHILLIP ET AL) 17 March 1998 (1998-03-17) claim 1; figures -/ ther documents are listed in the continuation of box C. It patent family member or priority date and not in cited to be of particular relevance invention. "T" later document published or priority date and not in cited to understand the priority date and not in cited to be of particular relevance.		

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Name and mailing address of the ISA

31 October 2001

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26. 03. 2002

Authorized officer

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INT RNATIONAL SEARCH REPORT

Inter. Snal Application No
PCT/US 01/08183

	tinuation) DOCUMENTS CONSIDERED TO BE RELEVANT					
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.				
A	PATENT ABSTRACTS OF JAPAN vol. 1999, no. 11, 30 September 1999 (1999-09-30) & JP 11 164890 A (TORAY MEDICAL CO LTD), 22 June 1999 (1999-06-22) abstract	1,8,17, 22				

International application No. PCT/US 01/08183

INTERNATIONAL SEARCH REPORT

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)	
This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:	
1. X Claims Nos.: 11-16, 25, 31-33, 39-42 because they relate to subject matter not required to be searched by this Authority, namely:	
Rule 39.1(iv) PCT - Method for treatment of the human or animal body by surgery	
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:	
see additional sheet	
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. X 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.: 1-10, 17-24	
Remark on Protest The additional search fees were accompanied by the applicant's protest. No protest accompanied the payment of additional search fees.	

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-10,17-24

An emboli protection system comprising a catheter with a distal blocking balloon having a surface defining a plurality of perforations facing the proximal end of the catheter, a proximal blocking balloon having a surface defining a plurality of perforations facing away from the proximal end of the proximal blocking balloon catheter and inflation fluid supply for supplying inflation fluid to the inflatable balloons which can exit the perforations and flush emboli in the isolated portion of the blood.

2. Claims: 26-30

An emboli protection system comprising a catheter shaft having an inflatable balloon with a surface defining a plurality of perforations in the balloon facing the proximal end of the shaft and an inflation valve disposed in the catheter shaft.

3. Claims: 34-38,43-47

An emboli protection system comprising a catheter shaft having a first inflatable balloon, an infusion and an evacuation port on the surface of the catheter shaft and a second and third inflatable balloons.

IN' RNATIONAL SEARCH REPORT

Information on patent family members

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PCT/US 01/08183

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