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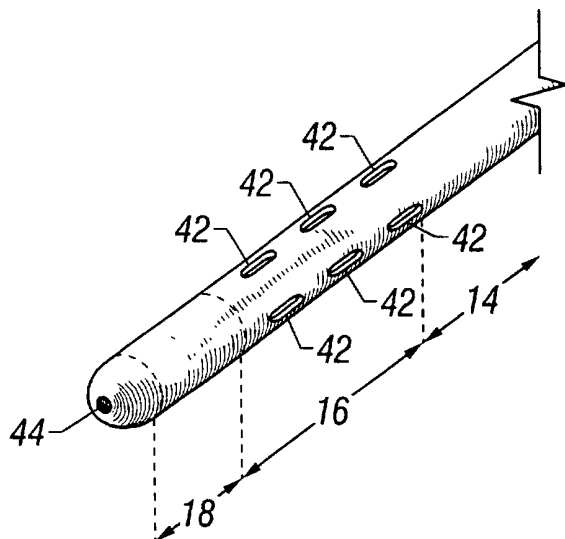
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- Published:**  
— with international search report
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13 December 2001
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(54) Title: ANTI-RECOIL CATHETER



(57) Abstract: A design is disclosed for a catheter assembly (10) used during interventional and/or diagnostic procedures. The catheter includes a plurality of openings (44, 42) that allow for controlled fluid flow as the fluid exits the lumen of the catheter and can be inserted into the vascular system over a guidewire. As a result, the openings balance the fluid forces and, thereby, stabilize the distal tip (18) to accommodate a wide range of injection parameters. The particular design of the catheter assembly of the present invention also reduces and/or eliminates recoil of the catheter tip during high volume injections, such as those associated with coronary or ventricular angiography.

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# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/US 01/00307

<b>A. CLASSIFICATION OF SUBJECT MATTER</b> IPC 7 A61M25/00 A61M25/01		
According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b>		
Minimum documentation searched (classification system followed by classification symbols) IPC 7 A61M		
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, WPI Data		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 584 803 A (MACHOLD TIMOTHY R ET AL) 17 December 1996 (1996-12-17)  column 30, line 14-43 column 31, line 38-54 column 34, line 7-12 figure 25  ---	1-4, 6-10, 14-16
X	US 5 085 635 A (CRAGG ANDREW H) 4 February 1992 (1992-02-04) column 2, line 46 -column 3, line 34; figure 1  ---	1,7-10, 14-17
Y	---	2-6,18
Y	EP 0 334 640 A (BAXTER INT) 27 September 1989 (1989-09-27) column 4, line 40 -column 5, line 44; figure 1  ---	2-6,18
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<input checked="" type="checkbox"/> Further documents are listed in the continuation of box C. <span style="margin-left: 200px;"><input checked="" type="checkbox"/> Patent family members are listed in annex.</span>		
° Special categories of cited documents :		
"A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed		"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
Date of the actual completion of the international search  <p style="text-align: center; font-size: 1.2em;">9 March 2001</p>		Date of mailing of the international search report  <p style="text-align: center; font-size: 1.2em;">06.07.01</p>
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016		Authorized officer  <p style="text-align: center; font-size: 1.2em;">Rosenblatt, T</p>

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 01/00307

**C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 843 050 A (EVANS SCOTT ET AL) 1 December 1998 (1998-12-01)  column 3, line 59 -column 4, line 42 column 6, line 46-57 column 10, line 17 -column 11, line 45 figures 1,5,6  ---	1,3, 7-10, 13-19
X	US 5 380 307 A (CHEE U HIRAM ET AL) 10 January 1995 (1995-01-10) column 3, line 40 -column 5, line 15; figures 1,2  ---	1,7-10, 14-17,20
X	US 5 807 349 A (MASTRI DOMINICK L ET AL) 15 September 1998 (1998-09-15) cited in the application column 3, line 24 -column 4, line 26; figure 7 column 5, line 17-30; figure 15  -----	1,8-12, 14-17

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US 01/00307

## 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.  Claims Nos.: 21,22  
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
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:

see additional sheet

1.  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.:

1-20

### 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: 1-20

catheter assembly with sidewall openings and distal tip opening for fluid control

2. Claims: 23-28

fixture for measuring catheter movement during a simulated injection procedure, and method of measuring

3. Claims: 29-35

fixture for measuring fluid backflow from a catheter during a simulated injection procedure, and method of measuring

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 01/00307

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Information on patent family members

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