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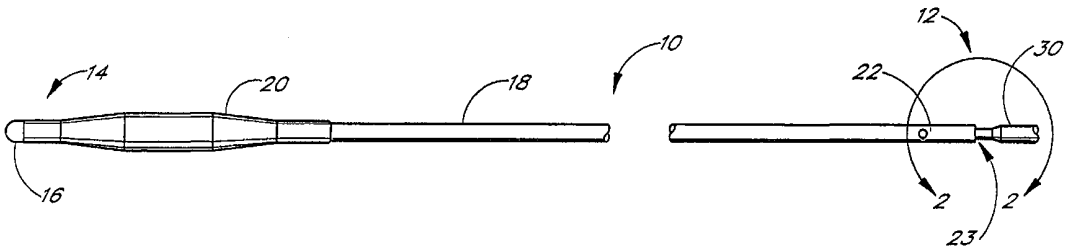
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(88) Date of publication of the international search report:
17 September 1998 (17.09.98)

(54) Title: LOW PROFILE CATHETER VALVE



(57) Abstract

Disclosed herein is a low profile catheter valve comprising a movable sealer portion positioned within the inflation lumen of a catheter. The sealer portion forms a fluid tight seal with the inflation lumen by firmly contacting the entire circumference of a section of the inflation lumen. The sealer portion may be positioned proximally of a side-access inflation port on the catheter, to establish an unrestricted fluid pathway between the inflation port and an inflatable balloon on the distal end of the catheter. As desired, the clinician may move the sealer portion to a position distal of the inflation port, thereby preventing any fluid from being introduced into or withdrawn from the balloon via the inflation port.

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INTERNATIONAL SEARCH REPORT

Internatic Application No
PCT/US 97/08469

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 A61M25/10 A61M25/00

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 A61M F16K

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)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	US 4 333 452 A (AU) 8 June 1982 see column 4, line 5 - column 5, line 33; figures	22 1,17,21, 23,24, 28,29
X A	US 3 982 544 A (DYCK) 28 September 1976 see column 5, line 57 - column 6, line 47; figures	22 1,17,21, 23
A	EP 0 710 490 A (SCIMED LIFE SYSTEMS) 8 May 1996 see column 9, line 19 - column 10, line 13; figure 2	1,17, 21-23
A	US 5 167 239 A (COHEN) 1 December 1992 cited in the application see abstract; figures	1,17, 21-23

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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

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"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	Date of mailing of the international search report
3 July 1998	24. 07. 98

Name and mailing address of the ISA	Authorized officer
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	Kousouretas, I

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INTERNATIONAL SEARCH REPORT

Internati Application No
PCT/US 97/08469

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 968 306 A (HUSS) 6 November 1990 see abstract; figures	1,2,17, 21
A	US 4 205 691 A (THE KENDALL COMPANY) 3 June 1980 see column 4, line 46 - line 66; figures 10-16	23
A	US 4 205 683 A (WILLIAM) 3 June 1980 see column 2, line 8 - column 3, line 7; figures	24,28,29
A	EP 0 547 358 A (CARDIO-SEARCH) 23 June 1993 see the whole document	24,28,29
A	GB 2 139 725 A (SAUNDERS) 14 November 1984 see abstract; figures	24,28,29

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 97/08469

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.:
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:

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.:

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: 1-23

A valve comprising a flexible elongate tubular body,an expandable member,an access opening on the tubular boby and a movable sealing member having a sealer portion which seals against a surface of the tubular body.

2. Claims: 24-29

An inflation adaptor comprising a housing,an inflation inlet connected to a source of inflation fluid,a seal which seals portions of said housing together and an actuator which drives a member.

INTERNATIONAL SEARCH REPORT

Information on patent family members

Internati Application No
PCT/US 97/08469

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4333452 A	08-06-1982	US 4178938 A	18-12-1979
		DE 2827648 A	18-01-1979
		GB 2000259 A,B	04-01-1979
		GB 2060826 A,B	07-05-1981
		JP 54017526 A	08-02-1979
		US 4178940 A	18-12-1979
US 3982544 A	28-09-1976	NONE	
EP 710490 A	08-05-1996	US 5647847 A	15-07-1997
		JP 8206228 A	13-08-1996
US 5167239 A	01-12-1992	WO 9221282 A	10-12-1992
US 4968306 A	06-11-1990	CA 2020614 A	08-01-1991
		EP 0406901 A	09-01-1991
		JP 3131272 A	04-06-1991
US 4205691 A	03-06-1980	US 4133303 A	09-01-1979
		AU 515294 B	26-03-1981
		AU 3551478 A	01-11-1979
		BE 866583 A	14-08-1978
		BR 7802642 A	09-01-1979
		CA 1113822 A	08-12-1981
		DE 2817232 A	02-11-1978
		FR 2388567 A	24-11-1978
		GB 1560458 A	06-02-1980
		JP 53136393 A	28-11-1978
		JP 62006822 B	13-02-1987
		NL 7804481 A	31-10-1978
		SE 435134 B	10-09-1984
		SE 7804870 A	29-10-1978
		ZA 7801939 A	28-03-1979
US 4205683 A	03-06-1980	US 4088135 A	09-05-1978
		JP 53085986 A	28-07-1978
EP 547358 A	23-06-1993	US 5364358 A	15-11-1994
		CA 2081944 A	06-05-1993

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 2139725 A	14-11-1984	NONE	