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27 December 2012

(54) Title: STEERABLE CATHETER

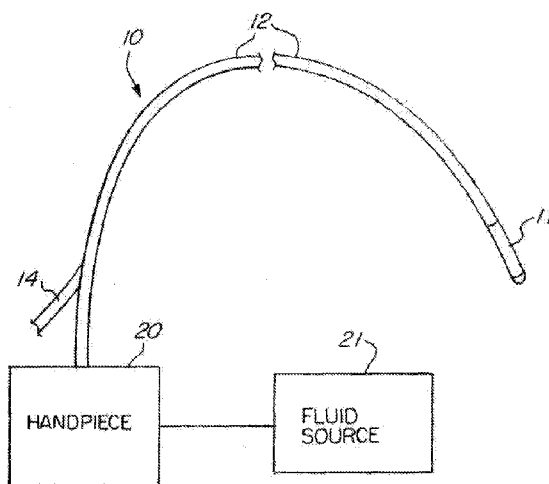


FIG. 1

(57) Abstract: The present invention relates to a steerable catheter device and method of using the same comprising a catheter body having a distal section. The distal section of the catheter body has an inner lumen, and one or more steering lumen radially offset from the inner lumen. The steering lumen comprise a first end having a first diameter and a second end having a second diameter smaller than the first diameter. A fluid source is in fluid communication with the steering lumen for supplying fluid thereto to dis-tend the first end of the steering lumen such that the catheter body bends away from the steering lumen. In some cases, a vacuum is supplied to an opposite lumen to further assist bending of the catheter body. The inner lumen may include a porous material that is utilized to clean an instrument, such as an imaging device, movably disposed in the lumen.



WO 2012/118924 A3

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 12/27205

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - A61M 31/00 (2012.01)

USPC - 604/95.03

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)

USPC: 604/95.03

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
USPC: 604/523, 528, 95.01, 95.02, 95.04; 600/101, 407 (keyword limited; terms below)

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

PubWEST (PGPB, USPT, EPAB, JPAB); Google Scholar

Search terms: Steering, lumen, channel, orifice, opening, taper\$, wedge\$, increas\$, decreas\$, diameter, size, dimension\$, steer\$, mov\$, curl\$, bend\$, deflect\$, maneuver\$, catheter, device, probe, instrument, fluid, pressur\$, air, gas, transduc\$, electric\$, porous\$.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X — Y	US 2007/0100235 A1 (KENNEDY) 03 May 2007 (03.05.2007), Fig 2A, 5A-5C, 9, para[0047], [0048], [0050], [0051], [0060], [0063], [0065], [0071]-[0073], [0078]-[0083], [0089]-[0095], [0099], [0104]-[0106]	1-3, 5-9, 13, 14, 17-22, 24-27, 31, 32, 34, 36-39, and 41 — 4, 10-12, 15, 16, 23, 28-30, 33, 35, 40, and 42
Y	US 2009/0030400 A1 (BOSE et al.) 29 January 2009 (29.01.2009), Fig 2A, abstract, para[0016], [0018]-[0020]	4, 15, 23, and 33
Y	US 5,392,766 A (MASTERSON et al.) 28 February 1995 (28.02.1995), Fig 11-13, abstract, col 3, ln 58-60, col 5, ln 44-50, col 6, ln 35-46, col 9, ln 43 to col 10, 18)	10-12 and 28-30
Y	US 2008/0147000 A1 (SEIBEL et al.) 19 June 2008 (19.06.2008), abstract, para[0004], [0074]	16, 35, and 42
Y	US 2010/0168665 A1 (SKERVEN) 01 July 2010 (01.07.2010), Fig 4, 5, para[0042], [0043]	40
A	US 2010/0010437 A1 (MILES et al.) 14 January 2010 (14.01.2010), entire document	1-42

☐ Further documents are listed in the continuation of Box C.

* 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 application or patent 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

22 August 2012 (22.08.2012)

Date of mailing of the international search report

07 SEP 2012

Name and mailing address of the ISA/US

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 12/27205

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 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 No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I: Claims 1-42, drawn to systems and methods steering a catheter.

Group II: Claims 43-44, drawn to a systems to clean ends of catheter imaging devices.

The inventions listed as Groups I - II do not relate to a single general 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 reasons:

--Please See Extra 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 additional fees, this Authority did not invite payment of additional fees.
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. 1-42

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.