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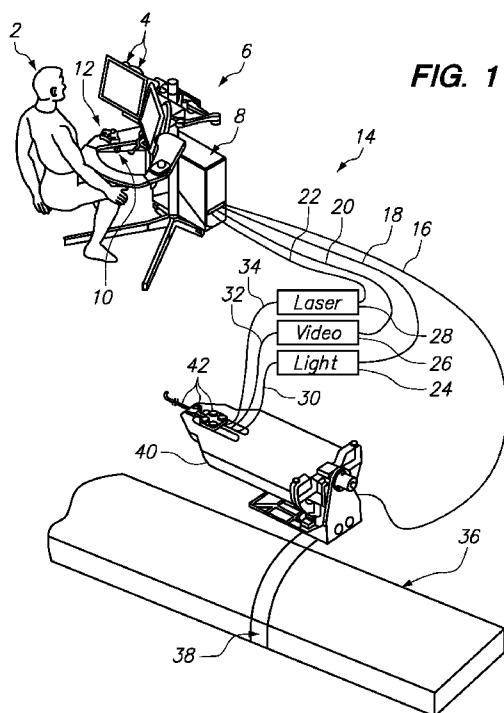
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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT,

[Continued on next page]

(54) Title: ENDOSCOPIC ROBOTIC CATHETER SYSTEM



(57) Abstract: A robotic catheter system includes an instrument driver in communication with a controller and having an elongate instrument interface including a plurality of instrument drive elements responsive to control signals generated, at least in part, by user input through a master input device operatively coupled to the controller, and an elongate instrument having a guide instrument base operatively coupled to the guide instrument interface. The elongate instrument comprises additional lumens to accommodate instruments such as an optics bundle, a light bundle, a laser fiber, and flush irrigation. The working lumen preferably is configured to accommodate a grasping or capturing tool, such as a collapsible basket or grasper, for use in procedures such as kidney stone interventions.



HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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INTERNATIONAL SEARCH REPORT

International application No

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A. CLASSIFICATION OF SUBJECT MATTER

INV. A61B19/00

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A61B17/221 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)

A61B

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)

EP0-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2007/005976 A1 (HANSEN MEDICAL INC [US]; MOLL FREDERIC H [US]; WALLACE DANIEL T [US];) 11 January 2007 (2007-01-11) claims 1,2,9,12,15,17; figures 1,4,5,14.1,18,19,52,86,93,95,103,109A,112A,111,172 figures 174A-D,180,187A-C,189B,192M,195A-G -----	1-30, 37-51
X	US 2005/222554 A1 (WALLACE DANIEL T [US] ET AL) 6 October 2005 (2005-10-06) figures 1,2,5,19,34,87,95,109A,174 -----	1-7, 10-16, 20-30, 37-51
A	US 2006/041245 A1 (FERRY STEVEN J [US] ET AL) 23 February 2006 (2006-02-23) figures 24,26A ----- -/-	16-19, 21-25

☒ Further documents 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 to be of particular relevance

"E" earlier document but published on or after the international filing date

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"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

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Authorized officer

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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 2002/087048 A1 (BROCK DAVID L [US] ET AL) 4 July 2002 (2002-07-04) figure 46 -----	37
A	US 2009/112229 A1 (OMORI SHIGERU [JP] ET AL) 30 April 2009 (2009-04-30) figure 55 -----	16
A	EP 1 779 801 A2 (OLYMPUS MEDICAL SYSTEMS CORP [JP]) 2 May 2007 (2007-05-02) figures 7,9,16,22 -----	16
A	WO 2006/050574 A1 (DALTRAY PTY LTD [AU]; LUBOWSKI DAVID [AU]; MARSH PETER CRISPIN [AU]) 18 May 2006 (2006-05-18) page 5, line 26 - page 6, line 12 -----	2-4,6

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2010/042080

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.: 58-70
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
Rule 39.1(iv) PCT - Method for treatment of the human or animal body by therapy
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:

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 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.:
1-30, 37-51

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.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2010/042080

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2007005976 A1	11-01-2007	EP 1906858 A1 JP 2009500086 T	09-04-2008 08-01-2009
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FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-30, 37-51

robotic catheter system

1.1. claims: 2-9, 38-43

connection interfaces

1.2. claims: 10-15, 44-47, 49-51

features of the catheter

1.3. claims: 16-20

assembly to insert and retract the medical instrument

1.4. claims: 21-26

assembly to roll the medical instrument

1.5. claims: 27-30

specific medical instruments

2. claims: 31-36

manual control interface

3. claims: 52-57

robotic system with a base and mounting structure
