

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
14 October 2004 (14.10.2004)

PCT

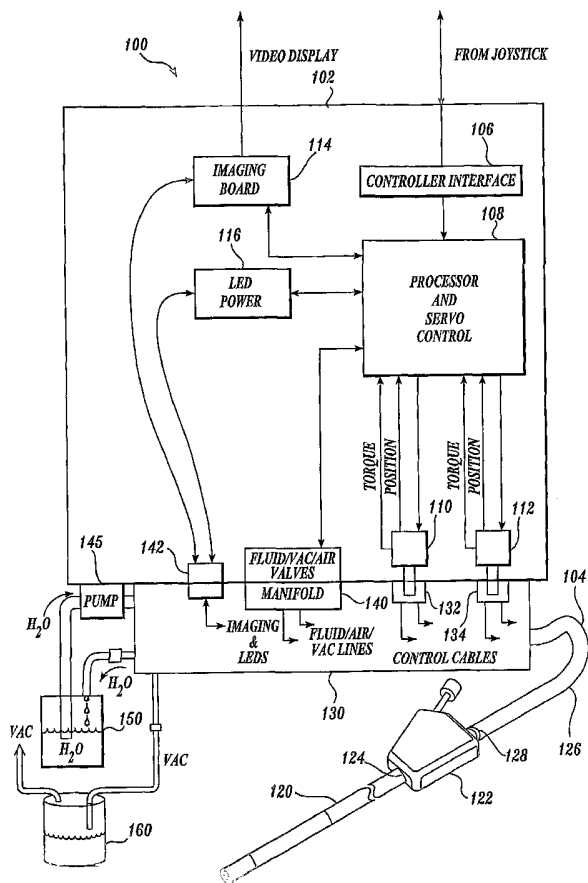
(10) International Publication Number
WO 2004/086957 A3

- (51) International Patent Classification⁷: A61B 1/008
- (21) International Application Number: PCT/US2004/009464
- (22) International Filing Date: 29 March 2004 (29.03.2004)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data: 10/406,149 1 April 2003 (01.04.2003) US
- (71) Applicant (for all designated States except US): SCIMED LIFE SYSTEMS, INC. [US/US]; One SCIMED Place, Maple Grove, MN 55411-1566 (US).
- (72) Inventors: BANIK, Michael, S.; 119 Wilder Road, Bolton, MA 01740 (US). BOULAIS, Dennis, R.; 7 Shepard Hill Road, Danielson, CT 06239 (US). COUVILLON, Lucien, A., Jr.; 190 Nashawtuc Road, Concord, MA

01742 (US). CHIN, Albert, C., C.; 25 Bernard Street, Newton, MA 02461 (US). ANDERSON, Frank, J.; 11 York Road, Mansfield, MA 02048 (US). MACNAMARA, Francis, T.; 89 Needham Street, Apt 2335, Newton Highlands, MA 02461 (US). FANTONE, Stephen, D.; 340 Summer Street, Lynnfield, MA 01940 (US). BRAUNSTEIN, Daniel, J.; 43 Draper Avenue, Arlington, MA 02474 (US). ORBAND, Daniel, G.; 14 Stonecleave Road, Boxford, MA 01921 (US). SABER, Michael; 47 Pleasant Street, Stoneham, MA 02180 (US). HUNTER, Ian, W.; 6 Oakdale Lane, Lincoln, MA 01773 (US). COPPOLA, Patsy, A.; 118 Davis Road, Bedford, MA 01730 (US). KIROUAC, Andrew, P.; 4 Comanche Circle, Chelmsford, MA 01824 (US). CLARK, Richard, J.; 4 Lee Ann Drive, Norfolk, MA 02056 (US). WISEMAN, Richard, M.; 21 High Rock Road, Wayland, MA 01778 (US). MASON, Timothy, J.; 12 West River Road, Uxbridge, MA 01569 (US). MEHTA, Neil, R.; 71 Glen Road, #3, Jamaica Plain, MA 02130 (US).

[Continued on next page]

(54) Title: SINGLE USE ENDOSCOPIC IMAGING SYSTEM



(57) Abstract: An endoscopic imaging system includes a reusable control cabinet having a number of actuators that control the orientation of a lightweight endoscope that is connectable thereto. The endoscope is used with a single patient and is then disposed. The endoscope includes an illumination mechanism, an image sensor, and an elongate shaft having one or more lumens located therein. An articulation joint at the distal end of the endoscope allows the distal end to be oriented by the actuators in the control cabinet. The endoscope is coated with a hydrophilic coating that reduces its coefficient of friction and because it is lightweight, requires less force to advance it to a desired location within a patient.

WO 2004/086957 A3



(74) **Agent:** TULLETT, Rodney, C.; Christensen O'Connor Johnson Kindness PLLC, 1420 Fifth Avenue, Suite 2800, Seattle, WA 98101 (US).

(81) **Designated States** (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) **Designated States** (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH,

GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

(88) **Date of publication of the international search report:**

24 March 2005

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US2004/009464

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A61B1/008

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 7 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)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 4 816 909 A (HIBINO HIROKI ET AL) 28 March 1989 (1989-03-28) column 4, line 7 - line 20 column 14, line 45 - column 15, line 11 column 31, line 56 - column 32, line 2 figures 20,25,54b -----	1-5
Y	US 3 572 325 A (BRUSHENKO ANATOLI ET AL) 23 March 1971 (1971-03-23) column 2, line 43 - column 3, line 38 figures 1-3 -----	1,4,5
Y	US 4 432 349 A (OSHIRO SUSUMU) 21 February 1984 (1984-02-21) column 2, line 32 - line 44 figure 2 -----	2
	----- -/--	

Further documents are listed in the continuation of box C.

Patent family members are listed in 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

"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

23 August 2004

Date of mailing of the international search report

03.01.2005

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

Abraham, V

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US2004/009464

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 3 266 059 A (STELLE ALLEN M) 16 August 1966 (1966-08-16) column 3, line 75 - column 4, line 23 figure 6	3
A	----- US 5 976 074 A (MORIYAMA HIROKI) 2 November 1999 (1999-11-02) column 23, line 57 - column 24, line 20 figure 16	1
A	----- US 2003/045778 A1 (BELSON AMIR ET AL) 6 March 2003 (2003-03-06) paragraph [0077] - paragraph [0078] figure 7a	1

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2004/009464

Box 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 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 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.:

1-6

Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
- No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International Application No. PCT/ US2004/ 009464

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-6

An imaging endoscope, details of the steering mechanism

2. claims: 7-11,38-54

An imaging endoscope comprising a connector comprising means for selectively directing a liquid and/or gas into one or more lumens

3. claims: 12-17,32-37

An endoscope comprising a cap and a heatexchanger assembly

4. claims: 18-28

An imaging endoscopic system comprising a control cabinet, a handheld controller and a single use endoscope connectable to the control cabinet

5. claims: 29-31

A handheld controller for operating a steerable endoscope comprising a tactile feedback mechanism

6. claim: 55

An imaging endoscopic system comprising a feedback mechanism avoiding breakage of the control cables

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/US2004/009464

Patent document cited in search report	A	Publication date	Patent family member(s)	Publication date
US 4816909	A	28-03-1989	JP 2624961 B2	25-06-1997
			JP 63186618 A	02-08-1988
			JP 1043227 A	15-02-1989
			JP 2643948 B2	25-08-1997
			JP 1107730 A	25-04-1989
			JP 2547226 B2	23-10-1996
			JP 1107732 A	25-04-1989
			JP 2547227 B2	23-10-1996
			JP 2034031 C	19-03-1996
			JP 7063448 B	12-07-1995
			JP 63153039 A	25-06-1988
			DE 3742900 A1	07-07-1988
			US 4887153 A	12-12-1989
			US 4926258 A	15-05-1990

US 3572325	A	23-03-1971	NONE	

US 4432349	A	21-02-1984	JP 55143802 U	15-10-1980
			JP 60041203 Y2	14-12-1985

US 3266059	A	16-08-1966	NONE	

US 5976074	A	02-11-1999	JP 9094215 A	08-04-1997
			JP 9294710 A	18-11-1997
			JP 10014860 A	20-01-1998
			US 5810715 A	22-09-1998

US 2003045778	A1	06-03-2003	US 2002022765 A1	21-02-2002
			WO 2004019769 A1	11-03-2004
			AU 5129201 A	15-10-2001
			CA 2406850 A1	11-10-2001
			EP 1267701 A1	02-01-2003
			JP 2003528677 T	30-09-2003
			NO 20024744 A	11-11-2002
			WO 0174235 A1	11-10-2001
			US 2002120178 A1	29-08-2002
			US 2002161281 A1	31-10-2002
			US 2003004399 A1	02-01-2003
			US 2002193661 A1	19-12-2002
			US 2002193662 A1	19-12-2002
			US 2003032859 A1	13-02-2003
			US 2003171650 A1	11-09-2003
			US 2003191367 A1	09-10-2003
			US 2004019254 A1	29-01-2004
			US 2004210109 A1	21-10-2004
			US 2004193008 A1	30-09-2004
US 2004220450 A1	04-11-2004			
US 2004193009 A1	30-09-2004			
US 2002062062 A1	23-05-2002			
