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[Continued on next page]

(54) Title: INTERFACE MECHANISM AND DETACHABLE SHAFT

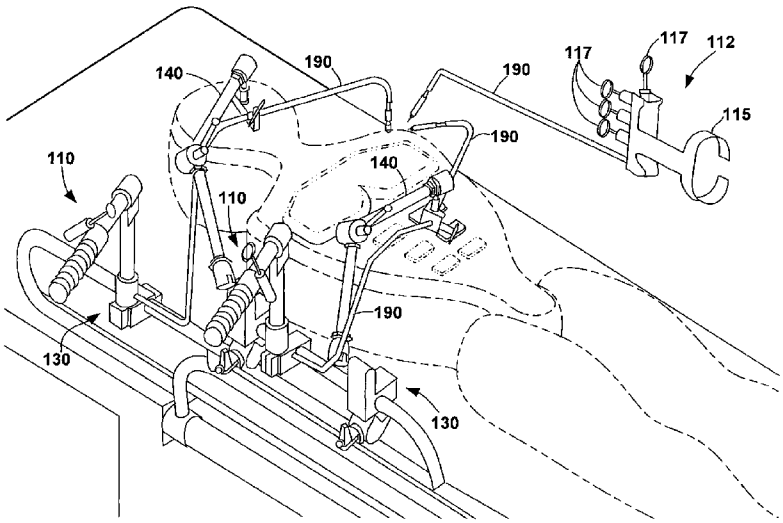


FIG. 1

(57) Abstract: An interface mechanism comprising: a ring defining an opening and configured for sealingly receiving a shaft there through, the ring comprising: an inner portion; and an outer portion, wherein the inner portion is sealingly coupled with a portion of a distal end of a mechanical slave cylinder of a surgical device, and the outer portion is coupled with the inner portion and is sealingly coupled with a draping material, the draping material configured for isolating a portion of the surgical device within a sterile environment.

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SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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International application No.
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A. CLASSIFICATION OF SUBJECT MATTER

A61B 19/00(2006.01)i, B25J 9/20(2006.01)i, B25J 3/00(2006.01)i, A61B 17/28(2006.01)i

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 19/00; A61B 17/42; A61M 37/00; F16D 31/02; A61B 17/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models
Japanese utility models and applications for utility models
Chinese utility models and applications for utility models

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

KOMPASS(KIPO internal) & keywords: droplet actuator, substrate, gap, electrode, blister, and temperature

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 2009-0105727 A1 (DOYLE, MARK C. et al.) 23 April 2009 See abstract; paragraph [29] - paragraph [84]; claim 26; Figure. 13.	1,2,17,23 3,14-16,18-22 ,24-25,28-30
A	US 5361583 A (HUITEMA, THOMAS W.) 8 November 1994 See abstract; column 4, lines 18 - column 5, lines 63; claims 1-4, Figure. 1.	1-3,14-25,28-30
A	US 2007-0156121 A1 (MILLMAN, PAUL et al.) 5 July 2007 See paragraph [61] - paragraph [269]; Figures. 1-20B.	1-3,14-25,28-30
A	US 2005-0043718 A1 (MADHANI, AKHIL JITEN et al.) 24 February 2005 See abstract; paragraph [35]; claim 1; Figure. 1.	1-3,14-25,28-30
A	US 6096004 A (MEGLAN, DWIGHT ALLAN et al.) 1 August 2000 See abstract; column 4, lines 30 - column 5, lines 48; claim 1, Figure. 2.	1-3,14-25,28-30

☐ 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 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 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
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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
21 MAY 2012 (21.05.2012)	**24 MAY 2012 (24.05.2012)**
Name and mailing address of the ISA/KR Korean Intellectual Property Office Government Complex-Daejeon, 189 Cheongsa-ro, Seo-gu, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140	Authorized officer RYU, Chang Yong Telephone No. 82-42-481-5546

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2011/053334

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.: 5-7, 13
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:

Claims 5-7 and 13 are not make meaningful search, because the claims refer multiple dependent claim do not referring to such claims in alternative only.

3. ☒ Claims Nos.: 4-13, 26-27
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:

1. ☐ As all required addtional 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 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/US2011/053334

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2009-0105727 A1	23.04.2009	AT 396650 T	15.06.2008
		AU 2001-280635 B2	21.09.2006
		AU 2001-80635 A1	05.02.2002
		CA 2415250 A1	31.01.2002
		CA 2415250 C	06.07.2010
		DE 60134236 D1	10.07.2008
		DK 1309277 T3	06.10.2008
		EP 1309277 A2	14.05.2003
		EP 1309277 B1	28.05.2008
		EP 2005914 A2	24.12.2008
		EP 2005914 A3	31.12.2008
		EP 2005914 B1	04.04.2012
		ES 2310186 T3	01.01.2009
		JP 2004-504095 A	12.02.2004
		KR 10-0834843 B1	04.06.2008
		US 2002-0111604 A1	15.08.2002
		US 2003-0153902 A1	14.08.2003
		US 2005-0090811 A1	28.04.2005
		US 2006-0195071 A1	31.08.2006
		US 2010-0241137 A1	23.09.2010
		US 6607475 B2	19.08.2003
		US 7470268 B2	30.12.2008
		US 8105319 B2	31.01.2012
		WO 02-07608 A2	31.01.2002
		WO 02-07608 A3	31.01.2002
		WO 2011-153082 A2	08.12.2011
US 5361583 A	08.11.1994	None	
US 2007-0156121 A1	05.07.2007	US 2007-005002 A1	04.01.2007
		US 2007-016174 A1	18.01.2007
		US 2009-099520 A1	16.04.2009
US 2005-0043718 A1	24.02.2005	CA 2128606 A1	22.07.1993
		CA 2128606 C	22.07.2008
		CA 2189775 A1	16.11.1995
		CA 2189775 C	11.07.2000
		CA 2632123 A1	22.07.1993
		CA 2632123 C	23.03.2010
		EP 0623066 A1	26.03.1997
		EP 0623066 B1	09.07.1997
		EP 0758469 A1	22.01.2003
		EP 0758469 B1	27.06.2007
		EP 0768567 A3	23.04.1997
		EP 0768567 B1	08.12.1999
		EP 0776738 A2	04.06.1997
		EP 0776738 A3	16.07.1997
		EP 0776738 B1	03.04.2002
		EP 0776739 A2	04.06.1997

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2011/053334

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		EP 0776739 B1	23.04.2003
		EP 1015944 A1	05.07.2000
		EP 1181627 A2	27.02.2002
		EP 1181627 B1	16.11.2005
		EP 1356781 A2	29.10.2003
		EP 1650615 A1	26.04.2006
		EP 1650615 B1	24.08.2011
		EP 1840818 A2	03.10.2007
		EP 1849566 A2	31.10.2007
		EP 2362283 A2	31.08.2011
		EP 2362284 A2	31.08.2011
		EP 2362285 A2	31.08.2011
		EP 2362286 A2	31.08.2011
		JP 09-146205 A	06.06.1997
		JP 10-504763 A	12.05.1998
		JP 2004-322310 A	18.11.2004
		JP 2005-261956 A	29.09.2005
		JP 2007-325960 A	20.12.2007
		JP 2007-325961 A	20.12.2007
		JP 2009-183733 A	20.08.2009
		JP 3557808 B2	25.08.2004
		JP 3583777 B2	04.11.2004
		JP 4156606 B2	24.09.2008
		JP 4172816 B2	29.10.2008
		JP 4324511 B2	02.09.2009
		JP 4324511 B2	12.06.2009
		JP 4430095 B2	10.03.2010
		JP 4430096 B2	10.03.2010
		US 05560184 A	01.10.1996
		US 05631973 A	20.05.1997
		US 05696837 A	09.12.1997
		US 05787680 A	04.08.1998
		US 05807664 A	15.09.1998
		US 05808665 A	15.09.1998
		US 05859934 A	12.01.1999
		US 2001-0046313 A1	29.11.2001
		US 2002-0055795 A1	09.05.2002
		US 2002-0058929 A1	16.05.2002
		US 2002-0120363 A1	29.08.2002
		US 2003-0023346 A1	30.01.2003
		US 2003-0228039 A1	11.12.2003
		US 2003-176948 A1	18.09.2003
		US 2005-0065657 A1	24.03.2005
		US 2005-0065658 A1	24.03.2005
		US 2005-0102062 A1	12.05.2005
		US 2006-0142897 A1	29.06.2006
		US 2007-0196004 A9	23.08.2007
		US 2007-0276423 A1	29.11.2007
		US 2009-012534 A1	08.01.2009
		US 2009-030429 A1	29.01.2009

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2011/053334

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		US 6223100 B1	24.04.2001
		US 6259806 B1	10.07.2001
		US 6364888 B1	02.04.2002
		US 6574355 B2	03.06.2003
		US 6684129 B2	27.01.2004
		US 6714839 B2	30.03.2004
		US 6731988 B1	04.05.2004
		US 6766204 B2	20.07.2004
		US 6786896 B1	07.09.2004
		US 6788999 B2	07.09.2004
		US 6850817 B1	01.02.2005
		US 6963792 B1	08.11.2005
		US 6999852 B2	14.02.2006
		US 7006895 B2	28.02.2006
		US 7107124 B2	12.09.2006
		US 7248944 B2	24.07.2007
		US 7333642 B2	19.02.2008
		US 7890211 B2	15.02.2011
		US 8123740 B2	28.02.2012
		WO 00-60421 A2	12.10.2000
		WO 00-60421 A3	12.10.2000
		WO 93-13916 A1	22.07.1993
		WO 95-30964 A1	16.11.1995
		WO 99-50721 A1	07.10.1999
US 6096004 A	01.08.2000	EP 0970663 A1	12.01.2000
		JP 2000-042116 A	15.02.2000
		JP 2009-061290 A	26.03.2009