(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
26 January 2012 (26.01.2012)

PCT

(10) International Publication Number
WO 2012/012807 A3

(51) International Patent Classification:
A61B 18/02 (2006.01) *A61L 29/04* (2006.01)
A61M 25/01 (2006.01) *A61F 7/12* (2006.01)

(21) International Application Number:
PCT/US2011/045261

(22) International Filing Date:
25 July 2011 (25.07.2011)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/367,252 23 July 2010 (23.07.2010) US

(71) Applicant *(for all designated States except US)*: **BOARD OF REGENTS OF THE UNIVERSITY OF TEXAS SYSTEMS** [US/US]; 201 West 7th Street, Austin, TX 78701 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **FENG, Yusheng** [US/US]; 1628 Randolph Ridge Trail, Austin, Texas 78746 (US). **PAREKH, Dipen, J.** [IN/US]; 1311 Greystone Ridge, San Antonio, Texas 78258 (US). **CANTA, Richard, Dashan** [US/US]; 8513 Davis Oaks Trail, Austin, Texas 78748 (US). **DAVILA, Luis, Alberto** [US/US]; 2671 Crown Way, Eagle Pass, Texas 78852 (US). **LONG, Justin, Alexander** [US/US]; 13815 Chevy Oak, San Antonio, Texas 78247 (US).

(74) Agent: **WHITNEY, Jason, W.**; Jackson Walker LLP, 112 E. Pecan, Suite 2400, San Antonio, TX 78205 (US).

(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, 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.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

[Continued on next page]

(54) Title: SURGICAL COOLING DEVICE

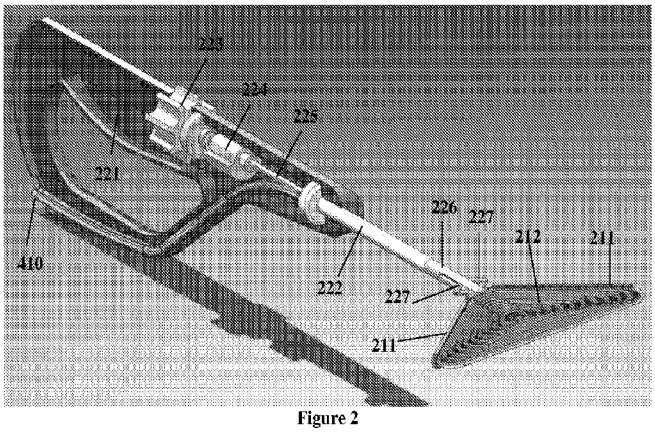

Figure 2

(57) Abstract: A surgical cooling device comprising a body having a handle and a shaft having a pair of axial cooling channels extending through the interior of the shaft; a cooling assembly comprising a pair of arms pivotally attached to the shaft and a foldable thermal exchanger mounted on the pair of arms and fluidly coupled to the pair of axial cooling, the thermal exchanger comprising an inlet port, an outlet port, and one or more exchange channels fluidly connecting the inlet port to the outlet port; and a mechanical control system for opening and closing the cooling assembly, the mechanical control system comprising a rotatable knob with a male threaded end, a plunger with a female threaded opening and an opening adapted to receive a rod, the rod engaging the plunger and a pair of wing connectors, the wing connectors attached to the rod and the pair of arms; wherein the cooling assembly unfolds from a closed position to an open position and folds from the open position to the closed position in response to rotation of the knob; and wherein a coolant flows through a first of the pair of axial cooling channels, through the one or more exchange channels, and out a second of the pair of cooling channels. BACKGROUND This invention relates to the field of medicine and more particularly to a surgical cooling device. The present invention is useful for cooling organs attendant to surgery. For example, in partial nephrectomies, the kidney is often cooled prior to performing the surgery. This specification describes a novel surgical cooling device useful in surgeries where organ cooling is desired. It may be applied in any setting by any approach (open, laparoscopic, robotic and/or any minimally invasive approach) on any organ where surface hypothermia is desired.

WO 2012/012807 A3

— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

— *of inventorship (Rule 4.17(iv))*

Published:

— *with international search report (Art. 21(3))*

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

(88) Date of publication of the international search report:
19 April 2012

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2011/045261

A. CLASSIFICATION OF SUBJECT MATTER

A61B 18/02(2006.01)i, A61M 25/01(2006.01)i, A61L 29/04(2006.01)i, A61F 7/12(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 18/02; A61N 7/00

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

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

eKOMPASS(KIPO internal) & Keywords: surgical, cooling, device, fold*.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2009-0234345 A1 (RAPHAEL HON) 17 September 2009 See the abstract and paragraphs [0060]-[0063] and figures 1, 7.	1-5
A	US 2009-0182317 A1 (ROBERT F. BENCINI) 16 July 2009 See the abstract and paragraphs [0035]-[0040] and figures 2-6.	1-5
A	US 2009-0138000 A1 (DAVID W. VANCELETTE et al.) 28 May 2009 See the abstract and paragraphs [0013]-[0016] and figures 1-5.	1-5
A	US 2009-0299235 A1 (EILAZ BABAEV) 03 December 2009 See the abstract and paragraphs [0014]-[0016] and figures 1-6.	1-5

☐ 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

"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	Date of mailing of the international search report
28 FEBRUARY 2012 (28.02.2012)	**29 FEBRUARY 2012 (29.02.2012)**

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

KIM, In Cheon

Telephone No. 82-42-481-8218

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2011/045261

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2009-0234345 A1	17.09.2009	CA 2719093 A1	17.09.2009
		EP 2265205 A1	29.12.2010
		KR 10-2011-0000654 A	04.01.2011
		WO 2009-114701 A1	17.09.2009
US 2009-0182317 A1	16.07.2009	CA 2703414 A1	16.07.2009
		EP 2249733 A1	17.11.2010
		JP 2011-509711 A	31.03.2011
		KR 10-2010-0110790 A	13.10.2010
		WO 2009-089427 A1	16.07.2009
US 2009-0138000 A1	28.05.2009	AU 2004-308416 A1	14.07.2005
		AU 2004-308416 B2	18.03.2010
		AU 2004-308417 A1	14.07.2005
		AU 2004-308417 B2	08.04.2010
		CA 2551555 A1	14.07.2005
		CA 2552219 A1	14.07.2005
		EP 1706050 A2	04.10.2006
		EP 1706051 A2	04.10.2006
		US 2005-0177147 A1	11.08.2005
		US 7500973 B2	10.03.2009
		WO 2005-063136 A2	14.07.2005
		WO 2005-063136 A3	14.07.2005
		WO 2005-063137 A2	14.07.2005
		WO 2005-063137 A3	14.07.2005
US 2009-0299235 A1	03.12.2009	US 2009-0306550 A1	10.12.2009
		WO 2009-149042 A2	10.12.2009
		WO 2009-149042 A3	10.12.2009