## (19) World Intellectual Property Organization

International Bureau





(10) International Publication Number

WO 2007/075903 A3

(43) International Publication Date 5 July 2007 (05.07.2007)

(51) International Patent Classification: A61F 2/06 (2006.01)

(21) International Application Number:

PCT/US2006/048815

(22) International Filing Date:

21 December 2006 (21.12.2006)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

60/754,107

27 December 2005 (27.12.2005) US

(71) Applicant (for all designated States except US): EAST CAROLINA UNIVERSITY [US/US]; 2200 Charles Boulevard, Greenville Centre, Room 2400, Greenville, North Carolina 27858 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): ISHIKAWA, Norihiko [JP/JP]; 1-159 Matsumura, Kanazawa, Ishikawa 920-0348 (JP). NIFONG, L. Wiley [US/US]; 300 Queen Anne Road, Greenville, North Carolina 27858 (US). SUN, You Su [US/US]; 109 Knight Drive, Winterville, North Carolina 28590 (US).

(74) Agent: MYERS BIGEL SIBLEY & SAJOVEC, P.A.; Po. Box 37428, Raleigh, North Carolina 27627 (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, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW

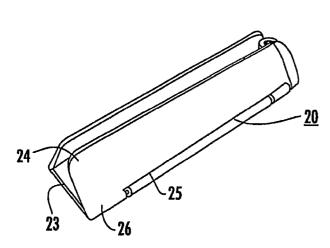
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, 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
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments
- (88) Date of publication of the international search report:

7 August 2008

(54) Title: ENDOSCOPIC CARDIAC RETRACTORS WITH FOLDING COMPONENTS CONFIGURED FOR INSERTION USING MINIMALLY INVASIVE ACCESS PORTS AND RELATED METHODS



(57) Abstract: Cardiac retractors include a rod and a foldable blade that can be introduced using minimally invasive access ports such that provided by an intra-thoracic cavity cannula. The rod can be integral to the blade or may be releasably attached in situ. The devices may be sized and configured to reside in situ proximate the mitral valve site at a left atria to splint open (lift a roof of) the mitral valve in response to robotic controlled direction of a surgeon for a mitral valve repair during a closed chest minimally invasive cardiac surgery.



WO 2007/075903 A3 ||||||||||||

## INTERNATIONAL SEARCH REPORT

International application No.

PC17US06/48815

A. CLASSIFICATION OF SUBJECT MATTER IPCi A6JF 2/06( 2006.01)		
USPC: 606/201 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)  *U.S.: 606/201		
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 practicable, search terms used)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		<u> </u>
Category * Citation of document, with indication, where a	appropriate, of the relevant passages	Relevant to claim No.
X US 2004/0138527 A1 (BONNER et al) 15 July. 2004	1 (15.07.2004), whole document.	1, 17-18, 20-21, 31, 33, <b>34</b>
<b>D</b> Furthei documents are listed in the continuation of Box C.	See patent family ann,ex.	
Special categories of cited documents:  "A" docummv. defining (he genera) stale of the art which is not considered to be of particutø relevance	"T" later document published after the in date and not in conflict with the appl principle or theory underlying the inv	ication but cited to understand the . vention
"E" earlier application or patent published on or after the international fling date	"X" document of particular relevance, the considered novel or cannot be consid	
"L" documen <sup>1</sup> which may throw doubls on priority claim(s) or which is cited Io 'establish the publication date of another citation or oilier special reason (as specified)	when the document is taken alone  "Y" document of particular relevaπο:; the considered to involve an inventive st with one ormore other such document	ep when the document is combined
"O" documem referring Io an oral disclosure, use, exhibition or other meas  "P" document published prior to the international filing dale but later than the	obvious to a person skilled In the art  "Sc" document member of the same paten	t family
priority date claimed		
Date of the actual completion of the international search	Date of mailing of the spin (A)	Freport
14 April 2003 (14.04.2008)	Authorized officer	
Name and mailing address of the ISA/US  Ma-1Stop PCT, Attn: ISA/US  Commissioner for Patents  P.O. Box 1450	Eduardo C, Robert Annie	Breport Hista Jug
Alexandria, Virginia 22313-1450 . Facsimile No. (571) 273-3201 Form PCT/ISA/2 IO(second sheet) (April 2007)	Telephone No. (571) 272-4719	Juj
form PLIJISA/J IO)(second sheet) (April 2007)		