



(51) International Patent Classification:
A61B 19/00 (2006.01) *B25J 9/18* (2006.01)

(21) International Application Number:
PCT/IB2008/003363

(22) International Filing Date:
16 April 2008 (16.04.2008)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/912,144 16 April 2007 (16.04.2007) US

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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, 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, 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, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: FRAME MAPPING AND FORCE FEEDBACK METHODS, DEVICES AND SYSTEMS

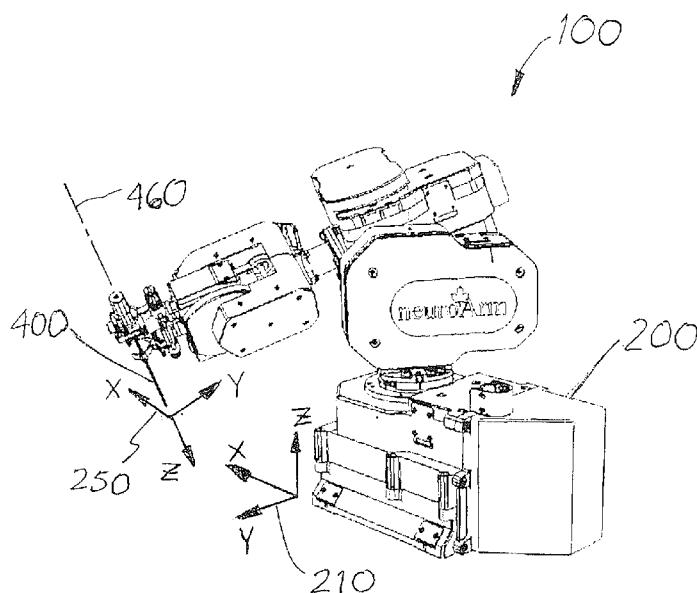


FIG. 7

(57) Abstract: Methods, devices, and systems for controlling movement of a slave manipulator by an operator controlling a master manipulator in a way that the motion of that slave manipulator can be presented via a display to the operator such that the displayed position of the slave manipulator is intuitive to the operator, regardless of the actual position and orientation of the slave manipulator. Methods, devices, and systems relating to force feedback associated with medical robotic procedures.

WO 2009/034477 A3



Published:

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

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

4 February 2010

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB2008/003363

A. CLASSIFICATION OF SUBJECT MATTER

IPC: **A61B 19/00** (2006.01), **B25J 9/18** (2006.01)

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 (2009.01): A61B 19/00, B25J-09/18

ECLA: B65J-09/02

USCL: 318/568.19

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

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

Questel-Orbit (PlusPat, FamPat), USPTO (keywords: Effector, coordinate system, instrument, tool, haptic, collision, reference system)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 815 640 (WANG, Y. et al.) 29 September 1998 (29-09-1998) *Abstract; Fig. 3, 6, 8, 15; Claim 1*	1, 2, 14, 53, 54, 66, 105, 106, 118
Y		3, 4, 15, 16, 26 - 28, 40, 41, 55, 56, 67, 68, 78 - 80, 92, 93, 107, 108, 119, 120, 130 - 132, 144 - 147
Y	EP 1 791 070 A2 (MANESH, P. et al) 30 May 2007 (30-05-2007) *Abstract; Fig. 8*	3, 15, 26 - 28, 40, 41, 55, 67, 78 - 80, 92, 93, 107, 119, 130 - 132, 144 - 147
Y	GB 2 235 067 A (Kabushiki, T et al.) 20 February 1991 (20-02-1991) *Abstract; Fig. 5; Page 7, lines 3 - 20*	4, 16, 56, 68, 108, 120

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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Date of the actual completion of the international search

16 April 2009 (16-04-2009)

Date of mailing of the international search report

11 May 2009 (11-05-2009)

Name and mailing address of the ISA/CA
Canadian Intellectual Property Office
Place du Portage I, C114 - 1st Floor, Box PCT
50 Victoria Street
Gatineau, Quebec K1A 0C9
Facsimile No.: 001-819-953-2476

Authorized officer

Vincent Pellerin 819- 953-3558

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB2008/003363

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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A	EP0 592 681 A1 (KAWAMURA, H. et al.) 20 April 1994 (20-04-1999) *Abstract; Page 3, line 9 - page 4, line 2,	
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