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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, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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- 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:

3 June 2010

## (54) Title: POWER INJECTOR WITH TILT SENSOR AND SYRINGE COMMUNICATION LOGIC

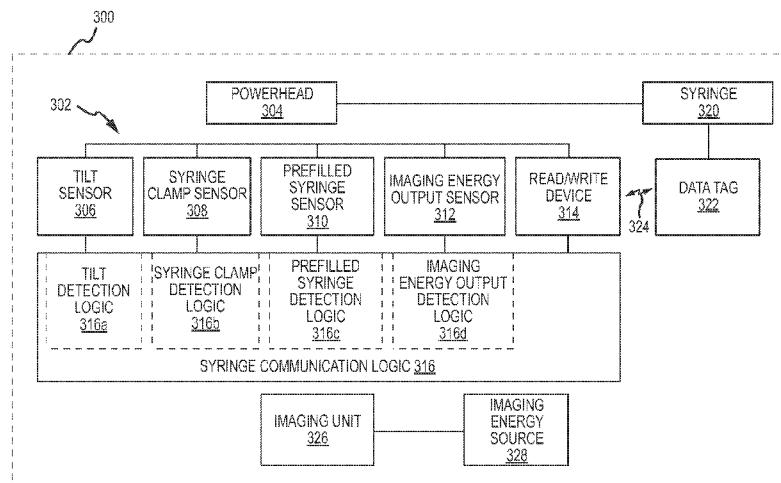


FIG.6

(57) Abstract: A power injector (302) with syringe communication logic (316) is disclosed. A communication with a syringe (320) for the power injector (302) may be initiated via data provided by one or more of a tilt sensor (306), a syringe clamp sensor (308), a prefilled syringe sensor (310), or an imaging energy output sensor (312).

# INTERNATIONAL SEARCH REPORT

International application No  
PCT/US2009/053969

**A. CLASSIFICATION OF SUBJECT MATTER**  
INV. A61M5/145  
ADD.

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)  
**A61M**

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**

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2006/109779 A (NEMOTO KYORINDO CO LTD [JP]; NEMOTO SHIGERU [JP]; HACHIYA TAKASHI [JP]) 19 October 2006 (2006-10-19) paragraphs [0042] - [0094]; figures 3-8 -----	1-7, 13-26
X	US 2005/182323 A1 (GRISPO KEITH M [US] ET AL) 18 August 2005 (2005-08-18) paragraphs [0042], [0043], [0054] - [0058], [0067], [0092] -----	1-7
Y	WO 2006/108026 A (MALLINCKRODT INC [US]; FAGO FRANK M [US]; SCOTT VALERIE ANN [GB]; LEE) 12 October 2006 (2006-10-12) paragraphs [0157], [0176], [0177]; figure 12 -----	13-26
		-/-

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 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
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"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

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8 April 2010

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## INTERNATIONAL SEARCH REPORT

International application No PCT/US2009/053969
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## C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 02/091008 A1 (LIEBEL FLARSHEIM CO [US]) 14 November 2002 (2002-11-14) page 2 - page 3 -----	8-26
A	US 2003/050555 A1 (CRITCHLOW RICHARD G [US] ET AL) 13 March 2003 (2003-03-13) paragraphs [0011], [0029], [0047], [0074] -----	8-26
X	EP 1 932 556 A1 (NEMOTO KYORINDO CO LTD [JP]) 18 June 2008 (2008-06-18) paragraphs [0097], [0141] - [0143] -----	27-39
X	WO 02/056934 A2 (MEDRAD INC [US]; COWAN KEVIN P [US]; IDDON BARRY [US]; YANNIELLO MICHA) 25 July 2002 (2002-07-25) page 4, lines 14-19 page 22, lines 14-24; figures 2c,6 -----	27,29, 32-39
A	US 2003/233069 A1 (GILLESPIE JOHN [US] ET AL GILLESPIE JR JOHN [US] ET AL) 18 December 2003 (2003-12-18) paragraph [0090] -----	34-39
A	US 2004/024361 A1 (FAGO FRANK M [US] ET AL FAGO FRANK M [US] ET AL) 5 February 2004 (2004-02-05) paragraph [0119] - paragraph [0121] -----	34-39
A	EP 1 723 977 A1 (NEMOTO KYORINDO CO LTD [JP]) 22 November 2006 (2006-11-22) paragraphs [0093] - [0095] -----	27
A	US 2006/079765 A1 (NEER CHARLES S [US] ET AL NEER CHARLES S [US]) 13 April 2006 (2006-04-13) paragraph [0081] -----	27

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.1

Claims Nos.: 40-77

Rule 39.1(iv) PCT – Method for treatment of the human or animal body by surgery

The subject-matter defined comprises methods for treatment of the human body by surgery, i.e. methods suitable for infusing or injecting fluid, cf. e.g. dependent claims 45, claims 47 (last lines thereof).

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US2009/053969

### 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.: **40-77**  
because they relate to subject matter not required to be searched by this Authority, namely:

see FURTHER INFORMATION sheet PCT/ISA/210

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 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:

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 fees, this Authority did not invite payment of additional fees.
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.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-7, 13-26

Claims 1-7, and 13-26 essentially define a power injector comprising  
1) a syringe plunger driver comprising a motorised drive source,  
2) an orientation sensor, and  
3) syringe communication logic configured to initiate syringe communication in response to an output of said orientation sensor.

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2. claims: 8-26

Claims 8-12, 13-26 essentially define a power injector comprising  
1) a syringe plunger driver comprising a motorised drive source,  
2) an imaging energy output sensor, and  
3) a syringe communication logic configured to initiate syringe communication in response to an output of said imaging energy output sensor.

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3. claims: 27-39

Claims 27-39 essentially define a power injector comprising  
1) a syringe plunger driver comprising a motorised drive source,  
2) an transmitter and receiver, and  
3) prefilled syringe detection logic to detect if a prefilled syringe has been installed on the power injector.

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**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No PCT/US2009/053969	
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