## (19) World Intellectual Property Organization

International Bureau



# 

## (10) International Publication Number WO 2009/126872 A3

## (43) International Publication Date 15 October 2009 (15.10.2009)

(51) International Patent Classification: A61F 2/02 (2006.01) A61F 2/48 (2006.01)

(21) International Application Number:

PCT/US2009/040184

(22) International Filing Date:

10 April 2009 (10.04.2009)

(25) Filing Language:

**English** 

(26) Publication Language:

English

US

(30) Priority Data:

61/044,408

11 April 2008 (11.04.2008)

- (71) Applicant (for all designated States except US): BAL SEAL ENGINEERING [US/US]; 19650 Pauling, Foothill Ranch, CA 92610-2610 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): DILMAGHANI-AN, Farshid [US/US]; 19650 Pauling, Foothill Ranch, CA 92610-2610 (US). COOK, Hugh [US/US]; 19650 Pauling, Foothill Ranch, CA 92610-2610 (US).
- (74)Agents: DAO, Tom, H. et al.; Suite 204, 43 Corporate Park, Irvine, CA 92606 (US).
- 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, ST, 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, MK, 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).

#### **Declarations under Rule 4.17:**

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))

#### 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:

26 November 2009

#### (54) Title: CONNECTOR CARTRIDGE STACK FOR ELECTRICAL TRANSMISSION

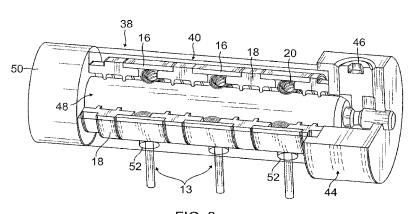


FIG. 2

(57) Abstract: Connector assemblies for use with implantable medical devices having easy to assemble contacts are disclosed. The connector assemblies are generally formed by coupling a plurality of ring contacts, sealing rings, and spring contact elements together with at least one holding ring to form a connector having a common bore for receiving a medical lead cable. Contact grooves or spring chambers for positioning the spring contact elements are formed in part by assembling multiple components together. A further aspect is a provision for encasing each connector assembly or stack inside a thermoset layer or a thermoplastic layer before over-molding the same to a sealed housing.





International application No. **PCT/US2009/040184** 

#### A. CLASSIFICATION OF SUBJECT MATTER

A61F 2/02(2006.01)i, A61F 2/48(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)

IPC A61F 2/02, A61N 1/05, H01R 24/04

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)

eKOMPASS(KIPO internal), NCBI PubMed database, Delphion Researh Intellectural Property Network database

#### C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 7,070,455 B2 (Balsells) Jul. 4, 2006. See figures 2, 3, 5 and claims 1- 14	1 - 23
A	US 2007-0239247 A1 (Camps et al.) Oct. 11, 2007. See the whole document.	1 - 23
A	WO 2004-030753 A1 (Laske, Timothy et al.) Apr. 15, 2004. See the whole document.	1 - 23
A	WO 97-35636 A1 (Ecker, Robert, M.) Oct. 2, 1997. See the whole document.	1 - 23

		Further documents are	listed in the	e 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
- "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

30 SEPTEMBER 2009 (30.09.2009)

Date of mailing of the international search report

30 SEPTEMBER 2009 (30.09.2009)

Name and mailing address of the ISA/KR



Korean Intellectual Property Office Government Complex-Daejeon, 139 Seonsa-ro, Seogu, Daejeon 302-701, Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

JEONG Eui Jun

Telephone No. 82-42-481-5549



### INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

## PCT/US2009/040184

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 07070455 B2	04.07.2006	EP 1726066 A2 EP 1726066 A4 US 2005-186829 A1 WO 2005-081927 A2 WO 2005-081927 A3	29.11.2006 05.03.2008 25.08.2005 09.09.2005 30.03.2006
HC 0007 0000047 A4	11 10 0007	WO 2005-081927 A8	08.06.2006
US 2007-0239247 A1	11.10.2007	WO 2007-115158 A2 WO 2007-115158 A3 WO 2007-115158 A3	11. 10.2007 17.01.2008 11. 10.2007
WO 2004-030753 A1	15.04.2004	CA 2500726 A1 EP 1549388 B1 EP 1549388 A1 JP 2006-501894 T JP 2006-501894 A US 2004-0147963 A1 US 06931286 B2 US 07103418 B2 US 07274966 B2 US 2004-0068299 A1 US 2004-0068312 A1 US 2004-0143314 A1	15.04.2004 15.07.2009 06.07.2005 19.01.2006 19.01.2006 29.07.2004 16.08.2005 05.09.2006 06.03.2007 25.09.2007 08.04.2004 08.04.2004 22.07.2004
WO 1997-035636 A1	02.10.1997	AU 2332297 A AU 718073 B2 AU 1997-23322 B2 CA 2220770 C DE 69724373 D1 DE 69724373 T2 EP 0835153 A1 EP 0835153 B1 JP 11-506380 T JP 11-506380 A US 05899927 A	17. 10. 1997 06. 04. 2000 18. 03. 1997 17. 08. 2004 02. 10. 2003 24. 06. 2004 15. 04. 1998 27. 08. 2003 08. 06. 1999 08. 06. 1999 04. 05. 1999