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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
28 May 2015 (28.05.2015)

WIPO | PCT

(10) International Publication Number
WO 2015/075026 A1

(51) **International Patent Classification**:
B60L 11/18 (2006.01)

(21) **International Application Number**:
PCT/EP2014/074889

(22) **International Filing Date**:
18 November 2014 (18.11.2014)

(25) **Filing Language**: English

(26) **Publication Language**: English

(30) **Priority Data**:
1320400.3 19 November 2013 (19.11.2013) GB

(71) **Applicant**: **BOMBARDIER TRANSPORTATION GMBH** [DE/DE]; Schöneberger Ufer 1, 10785 Berlin (DE).

(72) **Inventors**: **WORONOWICZ, Konrad**; 5029 Fox Run Place, Kingston, Ontario K7P 0E4 (CA). **CZAINSKI, Robert**; ul. Ogrodowa 32H, PL-71-032 Szczecin (PL). **ANDERS, Dominik**; Lindenhofstraße 96, 68163 Mannheim (DE). **SAFAEE, Alireza**; 5427 Youngridge Drive, Apt. 16, Ontario, Pittsburgh, Pennsylvania PA 15236 (US).

(74) **Agent**: **PATENTANWÄLTE BRESSEL UND PARTNER MBB**; Potsdamer Platz 10, 10785 Berlin (DE).

(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, BN, 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, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, 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, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, 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, KM, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

— *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))*

(54) **Title**: A METHOD OF OPERATING A THREE PHASE PRIMARY WINDING STRUCTURE AND A PRIMARY UNIT

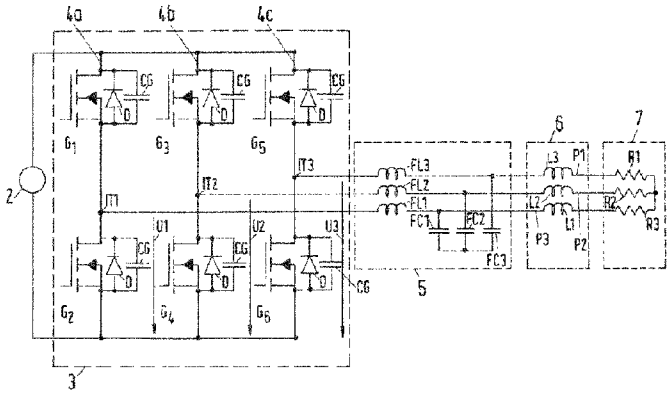

Fig.1

(57) **Abstract**: The invention relates to a method of operating a three phase primary winding structure (6) of a system for inductive power transfer, wherein the primary winding structure (6) comprises a first phase line (P1), a second phase line (P2) and a third phase line (P3), wherein in a standard operational mode a first phase input voltage (U1), a second phase input voltage (U2) and a third phase input voltage (U3) are controlled such that a predetermined phase shift between all three phase input voltages (U1, U2, U3) is provided, wherein in a modified operational mode the first phase input voltage (U1), the second phase input voltage (U2) and the third phase input voltage (U3) are controlled such that the set of phase shift values comprises at most two non-zero values and all non-zero phase shift values are equal. Furthermore, the invention relates to a primary unit of a system for inductive power transfer.

WO 2015/075026 A1