



(51) International Patent Classification:

H02K 1/30 (2006.01) *H02K 7/10* (2006.01)
H02K 1/18 (2006.01) *H02K 7/102* (2006.01)
H02K 7/18 (2006.01) *H02K 7/08* (2006.01)
H02K 15/02 (2006.01)

(21) International Application Number:

PCT/IB2013/056121

(22) International Filing Date:

25 July 2013 (25.07.2013)

(25) Filing Language:

Italian

(26) Publication Language:

English

(30) Priority Data:

MI2012A001305 25 July 2012 (25.07.2012) IT

(71) Applicant: **WILIC S.AR.L.** [LU/LU]; 1, Boulevard De La Foire, L-1528 Luxembourg (LU).

(72) Inventors: **BUSTREO, Paolo**; Via Europa, 70, I-39100 Bolzano (IT). **TOCCOLI, Paolo**; c/o WILIC S.AR.L., 1, Boulevard De La Foire, L-1528 Luxembourg (LU). **CASAZZA, Matteo**; Flaines, 207, I-39049 Val Di Vizze (IT).

(74) Agents: **BOGGIO, Luigi** et al.; Studio Torta S.p.A., Via Viotti, 9, I-10121 Torino (IT).

(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, IS, JP, KE, KG, 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, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, 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, 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).

[Continued on next page]

(54) Title: WIND TURBINE ROTARY ELECTRIC MACHINE, WIND TURBINE, AND METHOD OF ASSEMBLING A ROTARY ELECTRIC MACHINE TO A WIND TURBINE

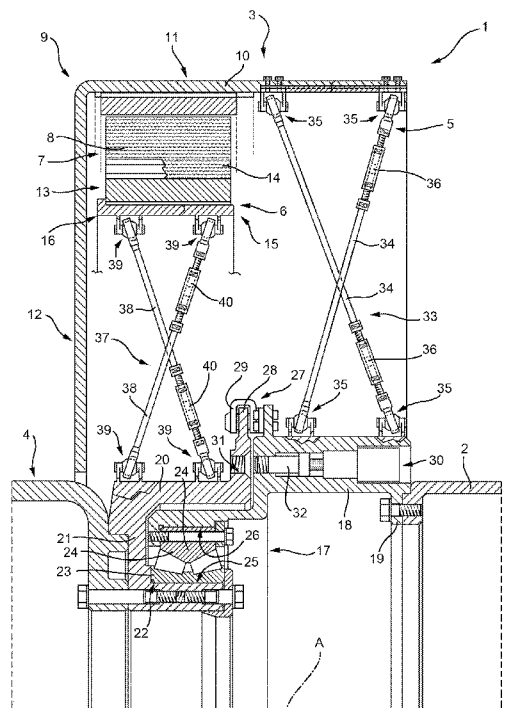


FIG. 1

(57) Abstract: A wind turbine rotary electric machine (3) has an active part (7) having a plurality of axial active segments (8) arranged about an axis of rotation (A); and a tubular structure (9), which extends about the axis of rotation (A), supports the active segments (8), and is divided into a plurality of first sectors (10) connected to one another and designed to fit to a frame (2) of the wind turbine (1).





Published:

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

20 March 2014

- *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))*

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2013/056121

| | | | | |
|---|----------|-----------|----------|-----------|
| A. CLASSIFICATION OF SUBJECT MATTER | | | | |
| INV. | H02K1/30 | H02K1/18 | H02K7/18 | H02K15/02 |
| ADD. | H02K7/10 | H02K7/102 | H02K7/08 | |
| 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) H02K |

| |
|---|
| 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) 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 02/099950 A1 (EVOLVING GENERATION LTD [GB]; GORDON PAUL [GB]; SPOONER EDWARD [GB]) 12 December 2002 (2002-12-12) page 4, paragraph 5 - page 6, paragraph 1 page 6, paragraph 2 page 7, paragraph 2 - paragraph 3 page 12, paragraph 1 figures | 1-33 |
| X | EP 1 988 282 A2 (TORRES DISENOS IND S A U M [ES] TORRES OLVEGA IND S L M [ES]) 5 November 2008 (2008-11-05) figures | 1-6,8, 13-15, 31-33 |
| A | WO 2004/068678 A1 (AEGIR KONSULT AB [SE]; ENGSTROEM STAFFAN [SE]) 12 August 2004 (2004-08-12) figures 2,3 | 1,9-12 |
| | ----- -/-- | |

| | |
|--|--|
| <input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. | <input checked="" type="checkbox"/> 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 | "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 |
| "E" earlier application or patent but published on or after the international filing date | "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 |
| "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) | "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 |
| "O" document referring to an oral disclosure, use, exhibition or other means | "&" document member of the same patent family |
| "P" document published prior to the international filing date but later than the priority date claimed | |

| | |
|--|--|
| Date of the actual completion of the international search 30 January 2014 | Date of mailing of the international search report 06/02/2014 |
|--|--|

| | |
|--|--|
| Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016 | Authorized officer Zanichelli, Franco |
|--|--|

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2013/056121

| C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT | | |
|--|---|-----------------------|
| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
| A | EP 2 169 220 A2 (GEN ELECTRIC [US]) 31 March 2010 (2010-03-31) paragraph [0014] - paragraph [0019]; figures 3-4b ----- | 16-19 |
| A | US 2012/091724 A1 (BODENSTEIN KLAUS [CN] ET AL) 19 April 2012 (2012-04-19) paragraph [0019] - paragraph [0023]; figures ----- | 16-20 |
| A | WO 2011/031165 A1 (BLAASTER WIND TECHNOLOGIES AS [NO]; PETERSEN TOROLF [NO]; PETERSEN O) 17 March 2011 (2011-03-17) page 2, line 29 - page 3, line 12 page 5, line 3 - line 30 figures ----- | 19,32,33 |
| A | US 2012/073118 A1 (BYWATERS GARRETT L [US] ET AL) 29 March 2012 (2012-03-29) paragraph [0052] - paragraph [0055]; figures ----- | 32,33 |

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/IB2013/056121

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date | |
|--|------------------|-------------------------|--------------------|------------|
| WO 02099950 | A1 | 12-12-2002 | AT 298944 T | 15-07-2005 |
| | | | CA 2448450 A1 | 12-12-2002 |
| | | | CN 1539191 A | 20-10-2004 |
| | | | DE 60204878 D1 | 04-08-2005 |
| | | | DE 60204878 T2 | 20-04-2006 |
| | | | DK 1393426 T3 | 31-10-2005 |
| | | | EP 1393426 A1 | 03-03-2004 |
| | | | ES 2244767 T3 | 16-12-2005 |
| | | | JP 2004528799 A | 16-09-2004 |
| | | | US 2004150272 A1 | 05-08-2004 |
| | | | WO 02099950 A1 | 12-12-2002 |
| ----- | | | | |
| EP 1988282 | A2 | 05-11-2008 | EP 1988282 A2 | 05-11-2008 |
| | | | ES 2343447 A1 | 30-07-2010 |
| | | | US 2008265585 A1 | 30-10-2008 |
| ----- | | | | |
| WO 2004068678 | A1 | 12-08-2004 | BR PI0407025 A | 10-01-2006 |
| | | | CA 2514340 A1 | 12-08-2004 |
| | | | EP 1588472 A1 | 26-10-2005 |
| | | | JP 2006517081 A | 13-07-2006 |
| | | | SE 0300186 A | 28-07-2004 |
| | | | US 2006097582 A1 | 11-05-2006 |
| | | | WO 2004068678 A1 | 12-08-2004 |
| | | | ----- | |
| EP 2169220 | A2 | 31-03-2010 | AT 532961 T | 15-11-2011 |
| | | | CN 101713382 A | 26-05-2010 |
| | | | DK 2169220 T3 | 05-12-2011 |
| | | | EP 2169220 A2 | 31-03-2010 |
| | | | US 2010079019 A1 | 01-04-2010 |
| | | | ----- | |
| US 2012091724 | A1 | 19-04-2012 | DE 102009017531 A1 | 21-10-2010 |
| | | | DK 2419992 T3 | 03-06-2013 |
| | | | EP 2419992 A1 | 22-02-2012 |
| | | | KR 20120014153 A | 16-02-2012 |
| | | | RU 2011142649 A | 27-05-2013 |
| | | | US 2012091724 A1 | 19-04-2012 |
| | | | WO 2010118791 A1 | 21-10-2010 |
| | | | ----- | |
| WO 2011031165 | A1 | 17-03-2011 | CA 2773751 A1 | 17-03-2011 |
| | | | CN 102695875 A | 26-09-2012 |
| | | | EP 2475877 A1 | 18-07-2012 |
| | | | NO 330062 B1 | 14-02-2011 |
| | | | US 2012181792 A1 | 19-07-2012 |
| | | | WO 2011031165 A1 | 17-03-2011 |
| | | | ----- | |
| US 2012073118 | A1 | 29-03-2012 | US 2012073118 A1 | 29-03-2012 |
| | | | WO 2012040538 A1 | 29-03-2012 |
| ----- | | | | |