



## (51) International Patent Classification:

*H02K 9/20* (2006.01) *H02K 1/20* (2006.01)  
*H02K 9/22* (2006.01) *H02K 7/18* (2006.01)  
*H02K 1/12* (2006.01)

## (21) International Application Number:

PCT/IB2013/056116

## (22) International Filing Date:

25 July 2013 (25.07.2013)

## (25) Filing Language:

Italian

## (26) Publication Language:

English

## (30) Priority Data:

MI2012A001301 25 July 2012 (25.07.2012) IT

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

## (72) Inventors: FOLIE, Georg; Via Angerweg, 90, I-39049 Wiesen (IT). CASAZZA, Matteo; Flaines, 207, I-39049 Val Di Vizze (IT). RENIER, Maddalena; Via Dorna, 9, I-39040 Salorno (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).

## 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:

20 March 2014

(54) Title: ACTIVE SEGMENT OF A WIND TURBINE ROTARY ELECTRIC MACHINE, ROTARY ELECTRIC MACHINE, AND WIND TURBINE

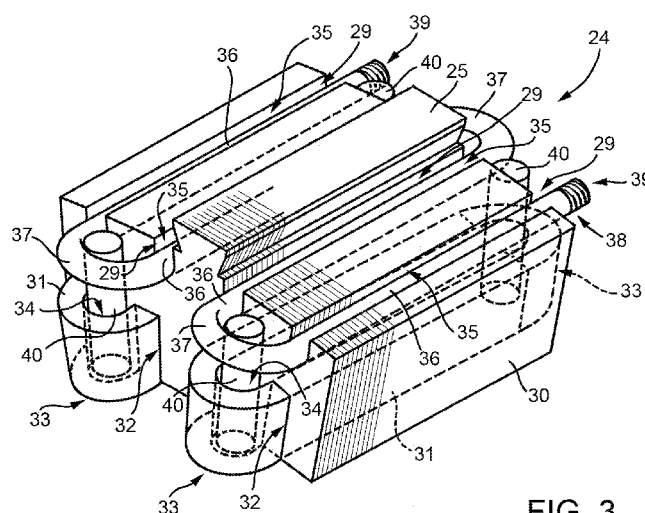


FIG. 3

(57) Abstract: An active segment (24) of a wind turbine rotary electric machine is selectively and prismatically connectable to a tubular support of a rotary electric machine, extends between two opposite ends to form, together with other active segments, an annular active part about an axis of rotation, and has a laminated pack (30); at least one active member (31) extending axially and fitted inside a seat (32) of the laminated pack (30); and at least one heat exchange member (40) located at one end to cool one end of the active member (31).

# INTERNATIONAL SEARCH REPORT

International application No  
PCT/IB2013/056116

## A. CLASSIFICATION OF SUBJECT MATTER

INV. H02K9/20 H02K9/22  
ADD. H02K1/12 H02K1/20 H02K7/18

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)

EP0-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         | EP 2 378 631 A1 (SIEMENS AG [DE])<br>19 October 2011 (2011-10-19)                                                             | 1,6-14,<br>16-20      |
| Y         | paragraph [0030]<br>paragraph [0032] - paragraph [0035];<br>figures 2, 4, 5                                                   | 2,3,15                |
| Y         | -----<br>GB 1 450 501 A (SIEMENS AG)<br>22 September 1976 (1976-09-22)<br>page 3, line 86 - line 100; figure 2                | 2,3                   |
| Y         | -----<br>EP 2 320 080 A1 (SIEMENS AG [DE])<br>11 May 2011 (2011-05-11)<br>paragraph [0046] - paragraph [0050];<br>figures 6,7 | 15                    |
|           | -----<br>-/--                                                                                                                 |                       |



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 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 another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"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

29 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/IB2013/056116

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages                                            | Relevant to claim No.  |
|-----------|-------------------------------------------------------------------------------------------------------------------------------|------------------------|
| X         | EP 2 109 208 A1 (SIEMENS AG [DE])<br>14 October 2009 (2009-10-14)                                                             | 1,4,<br>6-10,19,<br>20 |
| Y         | claims 1, 5-8, 12-15, 17-18; figures<br>-----                                                                                 | 5                      |
| Y         | US 2007/024132 A1 (SALAMAH SAMIR A [US] ET<br>AL) 1 February 2007 (2007-02-01)<br>abstract; figure 4<br>-----                 | 5                      |
| Y         | EP 2 187 506 A1 (WILIC S AR L [LU])<br>19 May 2010 (2010-05-19)<br>cited in the application<br>abstract; figures 2,3<br>----- | 1,6-14,<br>16-20       |
| Y         | US 2011/248584 A1 (LE BESNERAIS JEAN [FR])<br>13 October 2011 (2011-10-13)<br>the whole document<br>-----                     | 1,6-14,<br>16-20       |
| A         | US 2002/089242 A1 (LIANG FENG [US] ET AL)<br>11 July 2002 (2002-07-11)<br>abstract; figures 2,3<br>-----                      | 2,3                    |
| A         | JP 2004 208461 A (NISSAN MOTOR)<br>22 July 2004 (2004-07-22)<br>abstract; figures 1, 3<br>-----                               | 2,3                    |

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/IB2013/056116

| Patent document<br>cited in search report |    | Publication<br>date | Patent family<br>member(s) | Publication<br>date |
|-------------------------------------------|----|---------------------|----------------------------|---------------------|
| EP 2378631                                | A1 | 19-10-2011          | CA 2736989 A1              | 13-10-2011          |
|                                           |    |                     | CN 102222992 A             | 19-10-2011          |
|                                           |    |                     | EP 2378631 A1              | 19-10-2011          |
|                                           |    |                     | US 2011248507 A1           | 13-10-2011          |
| -----                                     |    |                     |                            |                     |
| GB 1450501                                | A  | 22-09-1976          | DE 2333218 A1              | 30-01-1975          |
|                                           |    |                     | FR 2235520 A1              | 24-01-1975          |
|                                           |    |                     | GB 1450501 A               | 22-09-1976          |
|                                           |    |                     | IT 1015355 B               | 10-05-1977          |
|                                           |    |                     | JP S5036902 A              | 07-04-1975          |
|                                           |    |                     | JP S5583842 U              | 10-06-1980          |
|                                           |    |                     | JP S5922781 Y2             | 06-07-1984          |
| -----                                     |    |                     |                            |                     |
| EP 2320080                                | A1 | 11-05-2011          | CA 2720052 A1              | 06-05-2011          |
|                                           |    |                     | CN 102055256 A             | 11-05-2011          |
|                                           |    |                     | EP 2320080 A1              | 11-05-2011          |
|                                           |    |                     | JP 2011099442 A            | 19-05-2011          |
|                                           |    |                     | NZ 588950 A                | 25-05-2012          |
|                                           |    |                     | US 2011109095 A1           | 12-05-2011          |
| -----                                     |    |                     |                            |                     |
| EP 2109208                                | A1 | 14-10-2009          | CN 101557128 A             | 14-10-2009          |
|                                           |    |                     | DK 2109208 T3              | 11-11-2013          |
|                                           |    |                     | EP 2109208 A1              | 14-10-2009          |
|                                           |    |                     | ES 2431593 T3              | 27-11-2013          |
|                                           |    |                     | US 2009256431 A1           | 15-10-2009          |
| -----                                     |    |                     |                            |                     |
| US 2007024132                             | A1 | 01-02-2007          | DE 102006035721 A1         | 29-03-2007          |
|                                           |    |                     | ES 2329319 A1              | 24-11-2009          |
|                                           |    |                     | US 2007024132 A1           | 01-02-2007          |
| -----                                     |    |                     |                            |                     |
| EP 2187506                                | A1 | 19-05-2010          | CA 2685631 A1              | 13-05-2010          |
|                                           |    |                     | EP 2187506 A1              | 19-05-2010          |
|                                           |    |                     | US 2010123318 A1           | 20-05-2010          |
| -----                                     |    |                     |                            |                     |
| US 2011248584                             | A1 | 13-10-2011          | CA 2736987 A1              | 13-10-2011          |
|                                           |    |                     | CN 102223021 A             | 19-10-2011          |
|                                           |    |                     | DK 2378642 T3              | 26-08-2013          |
|                                           |    |                     | EP 2378642 A1              | 19-10-2011          |
|                                           |    |                     | EP 2506402 A2              | 03-10-2012          |
|                                           |    |                     | US 2011248584 A1           | 13-10-2011          |
| -----                                     |    |                     |                            |                     |
| US 2002089242                             | A1 | 11-07-2002          | DE 10201012 A1             | 25-07-2002          |
|                                           |    |                     | GB 2374732 A               | 23-10-2002          |
|                                           |    |                     | US 2002089242 A1           | 11-07-2002          |
|                                           |    |                     | US 2002089244 A1           | 11-07-2002          |
| -----                                     |    |                     |                            |                     |
| JP 2004208461                             | A  | 22-07-2004          | JP 4026496 B2              | 26-12-2007          |
|                                           |    |                     | JP 2004208461 A            | 22-07-2004          |
| -----                                     |    |                     |                            |                     |