

Title (en)

METHOD AND APPARATUS FOR CONVERTING DIRECT CURRENT INTO AN ALTERNATING CURRENT

Title (de)

VERFAHREN UND VORRICHTUNG ZUM UMWANDELN VON GLEICHSTROM IN EINEN WECHSELSTROM

Title (fr)

PROCÉDÉ ET APPAREIL DE CONVERSION D UN COURANT CONTINU EN UN COURANT ALTERNATIF

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Application

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Priority

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Abstract (en)

[origin: WO2009135284A1] A method and apparatus for converting direct current into alternating current is disclosed. The apparatus includes a converter circuit having first and second source nodes for receiving direct current from a source and first and second load nodes for connecting a load. The circuit includes first and second switches in series between the first and second source nodes with a common first intermediate node, and third and fourth switches in series between the first and second source nodes with a common second intermediate node. A first inductor is connected between the first intermediate node and the first load node, and a second inductor is connected between the second intermediate node and the second load node. The apparatus includes a controller for causing first, second, third, and fourth switching control signals to be asserted to cause the first, second, third, and fourth switches to selectively conduct current between the first and second source nodes and the first and second load nodes to produce an alternating current, and to cause a single shunt control signal to be asserted when the switching control signals are not asserted. The apparatus includes a bidirectional current shunt connected between the first and second intermediate nodes, the current shunt including a unitary switched current path for conducting current when the shunt control signal is asserted and the switching control signals are not asserted. The current shunt is configured to block current flow between the first and second intermediate nodes when the shunt control signal is not asserted.

IPC 8 full level

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Citation (search report)

- [I] US 5852558 A 19981222 - JULIAN ALEXANDER L [US], et al
- [A] US 2002079706 A1 20020627 - REBSDORF ANDERS V [DK], et al
- [A] MYRZIK J M A ET AL: "String and module integrated inverters for single-phase grid connected photovoltaic systems - a review", CONFERENCE PROCEEDINGS / 2003 IEEE BOLOGNA POWER TECH : JUNE 23 - 26, 2003, FACULTY OF ENGINEERING, UNIVERSITY OF BOLOGNA, BOLOGNA, ITALY, PISCATAWAY, NJ : IEEE SERVICE CENTER, US, vol. 2, 23 June 2003 (2003-06-23), pages 1 - 8, XP002523862, ISBN: 978-0-7803-7967-1
- See references of WO 2009135284A1

Citation (examination)

- "Power Converter Circuits", 1 January 2004, MARCEL DEKKER INC., U.S.A., ISBN: 978-0-8247-5054-1, article WILLIAM SHEPHERD ET AL: "14: Matrix Converters", pages: 416 - 445, XP055273629
- RAO A ET AL: "A MODIFIED SINGLE PHASE INVERTER TOPOLOGY WITH ACTIVE COMMON MODE VOLTAGE CANCELLATION", 30TH ANNUAL IEEE POWER ELECTRONICS SPECIALISTS CONFERENCE. PESC 99. RECORD. CHARLESTON; [ANNUAL POWER ELECTRONICS SPECIALISTS CONFERENCE], NEW YORK, NY : IEEE, US, 1 January 1999 (1999-01-01), pages 850 - 854, XP000924548, ISBN: 978-0-7803-5422-7, DOI: 10.1109/PESC.1999.785610
- ROBERTO GONZALEZ ET AL: "High-Efficiency Transformerless Single-phase Photovoltaic Inverter", POWER ELECTRONICS AND MOTION CONTROL CONFERENCE, 2006. EPE-PEMC 2006. 12TH INTERNATIONAL, IEEE, PISCATAWAY, NJ, USA, 30 August 2006 (2006-08-30), pages 1895 - 1900, XP031421900, ISBN: 978-1-4244-0121-5
- WINJNBERGEN ET AL: "A System for Dispersed Generator Participation in Voltage Control and Primary Frequency Control of the grid", POWER ELECTRONICS SPECIALISTS CONFERENCE, 2005. PESC '05. IEEE 36TH, IEEE, PISCATAWAY, NJ, USA, 1 January 2005 (2005-01-01), pages 2918 - 2924, XP031000538, ISBN: 978-0-7803-9033-1, DOI: 10.1109/PESC.2005.1582048
- SUNG-HUN KO ET AL: "A Grid-Connected Photovoltaic System with Direct Coupled Power Quality Control", IEEE INDUSTRIAL ELECTRONICS, IECON 2006 - 32ND ANNUAL CONFERENCE ON, IEEE, PISCATAWAY, NJ, USA, 1 November 2006 (2006-11-01), pages 5203 - 5208, XP031077537, ISBN: 978-1-4244-0135-2
- HASSAINE L ET AL: "Digital control based on the shifting phase for grid connected photovoltaic inverter", APPLIED POWER ELECTRONICS CONFERENCE AND EXPOSITION, 2008. APEC 2008. TWENTY-THIRD ANNUAL IEEE, IEEE, PISCATAWAY, NJ, USA, 24 February 2008 (2008-02-24), pages 945 - 951, XP031253361, ISBN: 978-1-4244-1873-2

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