

1) Family number: 52583023 (US2012319474A)

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Title: SYSTEMS AND METHODS FOR TRANSMISSION OF ELECTRIC POWER TO DOWNHOLE EQUIPMENT

Priority: US20110160004 20110614

Family:	Publication number	Publication date	Application number	Application date
	US2012319474 AA	20121220	US20110160004	20110614
	US8624530 BB	20140107	US20110160004	20110614

Probable Assignee: BAKER HUGHES INC

Assignee(s):(std): BAKER HUGHES INC ; BALL ANDREW K ; CHUNG CAMERON K ; WISNEWSKI MATTHEW D

Inventor(s):(std): CHUNG CAMERON K ; BALL ANDREW K ; WISNEWSKI MATTHEW D

Agent(s): LAW OFFICES OF MARK L BERRIER

International class (IPC 8-9): G05D1/02 H02J3/00 H02K7/14 (Advanced/Invention)

CPC: H02J3/1878 H02J3/1892 Y02E40/30 Y10T307/297

US class: 166/250.15 166/345 307/17 318/16 318/3 318/432 318/800 340/854.9 417/423.3

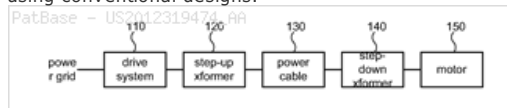
[Classification Explorer](#)

Cited documents: WO07055593 A1, WO07055587 A1, WO06132541 A1, US8305229 BA, US8264369 BB, US8212410 BB, US8082217 BB, US7798215 BB, US7724549 BB, US7649474 BA, US7615893 BB, US7348894 BB, US7152680 BB, US7026951 BB, US7009312 BB, US6945330 BB, US6621721 BB, US6420976 BA, US6150601 A, US6043995 A, US5782608 A, US5621844 A, US5259559 A, US4658383 A, US3513379 A, US3437992 A, US3402391 A, US2629076 A, US2013073100 AA, US2013057412 AA, US2012319628 AA, US2012292992 AA, US2012267955 AA, US2012267896 AA, US2012223524 AA, US2012212351 AA, US2012205981 AA, US2012200279 AA, US2012152559 AA, US2012140365 AA, US2012027630 AA, US2011304207 AA, US2011077885 AA, US2010132934 AA, US2010019930 AA, US2010019573 AA, US2009250210 AA, US2009200035 AA, US2009151932 AA, US2009146603 AA, US2009101338 AA, US2009090555 AA, US2009000789 AA, US2008306892 AA, US2008074074 AA, US2005270172 AA, US2005190584 AA, US2005029476 AA, US2003102720 AA, US2003011490 AA, EP2194638 A2, EP1082736 A2,

Forward Citations: WO17030701, US10263561, US10256762, US10044315, GB2557782,

Abstract:

Systems and methods in which output power that would conventionally be provided by surface equipment to drive downhole equipment, is transformed to increase the voltage before transmitting the power over a power cable to downhole equipment. The downhole equipment includes a step-down transformer that receives power from the power cable at a voltage which is too high to drive the motor or other downhole equipment and reduces the voltage to a level that is suitable for use by the downhole equipment. The step-down transformer may utilize toroidal transformers that are positioned around other components of the system, such as the shaft that couples a motor to an electric submersible pump. The step-down transformer may be configured as a modular unit that can be inserted between components (e.g. motor and seal) that are manufactured using conventional designs.



2) Family number: 59136161 (US2016281684A)

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Title: TURBULENCE PROTECTION SYSTEM AND METHOD FOR TURBINE GENERATORS

Priority: EP20130191559 20131105 RU20160121361 20141103 WO2014EP73604 20141103

Family:	Publication number	Publication date	Application number	Application date
	AU2014345693 AA	20160602	AU20140345693	20141103
	AU2014345693 BB	20180329	AU20140345693	20141103
	CA2929227 AA	20160428	CA20142929227	20141103
	CL2016001060 A1	20161111	CL20160001060	20160503
	CN105874198 A	20160817	CN201480072252	20141103
	EP2868919 A1	20150506	EP20130191559	20131105
	ID201709166 A	20170825	ID2016P0003771	20141103
	IN201617018176 A	20160831	IN201617018176	20160526
	JP2016535583 T2	20161110	JP20160551015T	20141103
	KR20160082594 A	20160708	KR20167015011	20141103
	PH2016500795 A	20160613	PH20160500795	20160428
	RU2016121361 A	20171211	RU20160121361	20141103
	RU2016121361 A3	20180614	RU20160121361	20141103
	US2016281684 AA	20160929	US20140034432	20141103
	US9920747 BB	20180320	US20140034432	20141103
	WO15067567 A1	20150514	WO2014EP73604	20141103

Probable Assignee: OPENHYDRO IP LTD
Assignee(s):(std): OPENHYDRO IP LTD
Assignee(s): SPOONER EDWARD ; CAWTHORNE SIMON
Inventor(s):(std): SPOONER EDWARD ; CAWTHORNE SIMON ; SIMON CAWTHORNE ; EDWARD SPOONER
Agent(s): FB RICE; FB RICE PTY LTD; BRION RAFFOUL; PCM ABOGADOS LIMITADA; WALLACE ALAN HUTCHINSON; LASMAN SITORUS SH MH; NISHIYAMA HARUYUKI; TAROLLI SUNDHEIM COVELL AND TUMMINO LLP; WALLACE ALAN

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

International class (IPC 8-9): F01D15/10 F03B13/00 F03B13/10 F03D9/00 F03D9/25 H02H7/12 H02H9/04 H02P9/00 H02P9/04 (Advanced/Invention)

CPC: F01D15/10 F03D7/0264 F03D9/255 F05B2270/107 H02H7/1216 Y02E10/725

US class: 1/1 290/43

JP class F-Term: 5H590 5H590/AA11 5H590/AB01 5H590/CA11 5H590/CA14 5H590/CC02 5H590/CD01 5H590/CD03 5H590/CE01 5H590/DD06 5H590/EB07 5H590/EB15 5H590/EB21 5H590/FA08 5H590/FB07 5H590/FC12 5H590/FC15 5H590/FC22 5H590/FC23 5H590/FC26 5H590/FC28 5H590/GA07 5H590/HA02 5H590/HA04 5H590/HA07 5H590/JA02

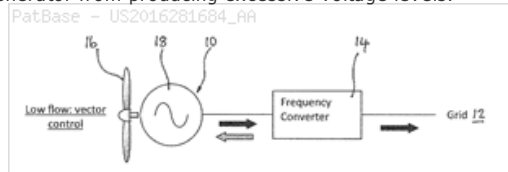
JP class F-Index: H02P101/10 H02P101/15 H02P103/20 H02P9/00/F H02P9/04/E

[Classification Explorer](#)

Cited documents: WO9950945 A1, WO13024037 A2, US9806665 BB, US9804623 BB, US9754717 BB, US9543748 BB, US9490626 BB, US9484850 BB, US9347429 BB, US8788108 BB, US8680707 BB, US8643215 BB, US8400740 BB, US7818159 BB, US7690456 BB, US7397143 BB, US7312537 BA, US6239997 BA, US5225712 A, US5083039 A, US2017279376 AA, US2017250540 AA, US2017237255 AA, US2017235286 AA, US2017207716 AA, US2016268831 AA, US2016099566 AA, US2014225457 AA, US2013271879 AA, US2013270902 AA, US2013215543 AA, US2013073109 AA, US2012243136 AA, US2011320052 AA, US2009008937 AA, US2008182466 AA, US2008093855 AA, US2008052059 AA, US2007290506 AA, US2007012492 AA, US2005184589 AA, JP2016538819 T2, JP2013070603 A2, JP2005269843 A2, JP2004015905 A2, EP2549613 A1, CN101534013 A, CN101092941 A,

Abstract:

A method of controlling power provided by a generator to an end system in which power is diverted from the output of said generator to an auxiliary system during periods of excessive power output from the generator. The diverted power is stored in an energy store and, during periods of lower power output from the generator, is returned to the end system by discharging the energy store. The diversion and return of power is controlled to maintain the power delivered to the end system at a desired mean power level. Diversion of power from the generator also has the effect of preventing the generator from producing excessive voltage levels.



3) Family number: 48485213 (US2012205981A)

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Title: UTILIZATION OF DISTRIBUTED GENERATOR INVERTERS AS STATCOM
Priority: US20090242501P 20090915 US20100309612P 20100302 US20100309613P 20100302
CA20102768101 20100915 US20100391699 20100915 WO2010CA01419 20100915
IN2012DN01640 20120223 US20120391699 20120507 US20130912969P 20131206
US20140562008 20141205 WO2014CA51174 20141205 US20160072014 20160316
US20170457193 20170313 US20190280756 20190220

Family:	Publication number	Publication date	Application number	Application date
	CA2768101 AA	20120222	CA20102768101	20100915
	CA2886409 AA	20150504	CA20142886409	20141205
	CA2886409 C	20160322	CA20142886409	20141205
	CA3048106 AA	20110324	CA20103048106	20100915
	CN102640378 A	20120815	CN201080038759	20100915
	CN102640378 B	20151125	CN201080038759	20100915
	CN105794066 A	20160720	CN201480066658	20141205
	CN105794066 B	20190426	CN201480066658	20141205
	EP2478610 A1	20120725	EP20100816511	20100915
	EP2478610 A4	20160810	EP20100816511	20100915
	EP3005515 A1	20160413	EP20140868572	20141205
	EP3005515 A4	20170517	EP20140868572	20141205
	IN01640DN2012 A	20160831	IN2012DN01640	20120223
	IN02562DN2015 A	20150911	IN2015DN02562	20150328
	IN201818045548 A	20190201	IN201818045548	20181203
	US2012205981 AA	20120816	US20100391699	20100915
	US2015162750 AA	20150611	US20140562008	20141205
	US2016197482 AA	20160707	US20160072014	20160316
	US2017250540 AA	20170831	US20170457193	20170313
	US2019245353 AA	20190808	US20190280756	20190220

US9325173 BB	20160426	US20100391699	20100915
US10256635 BB	20190409	US20160072014	20160316
WO11032265 A1	20110324	WO2010CA01419	20100915
WO15081444 A1	20150611	WO2014CA51174	20141205

Probable Assignee: VARMA RAJIV KUMAR

Assignee(s):(std): KHADKIKAR VINOD ; RAHMAN SHAH ARIFUR ; UNIV WESTERN ONTARIO ; RHAMAN SHAH ARIFUR ; VARMA RAJIV KUMAR

Assignee(s): UNIVERSITY OF WESTERN ONTARIO ; THE UNIVERSITY WESTERN ONTARIO ; WESTERN ONTARIO UNIV ; UNIV OF WESTERN ONTARIO ; RAHMAN SHAR ARIFUR ; THE UNIVERSITY OF WESTERN ONTARIO ; OF WESTERN ONTARIO UNIV ; RAHMAN RAJIV KUMAR

Inventor(s):(std): VINOD KHADKIKAR ; ARIFUR RHAMAN SHAH ; KUMAR VARMA RAJIV ; RAHMAN SHAH ARIFUR ; VARMA RAJIV KUMAR ; KHADKIKAR VINOD ; RAHMAN SHAR ARIFUR

Inventor(s): RHAMAN SHAH ARIFUR

Agent(s): BRION RAFFOUL; BROOKS NIGEL SAMUEL; RGTH; BRION; RAFFOUL BRION

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

International class (IPC 8-9): F03B13/14 F03D7/00 H02J13/00 H02J3/00 H02J3/01 H02J3/16 H02J3/18 H02J3/24 H02J3/38 H02J3/40 H02J4/00 H02J9/00 H02M7/44 H02S40/30 H02S40/32 (Advanced/Invention)

CPC: H02J3/1842 H02J3/40 Y02E10/563 Y02E40/16 Y02E40/22 Y02E40/40 Y10T307/615 H02J9/00 H02J3/386 H02M7/44 H02J3/383 H02J3/01 Y02E10/38 H02J7/35 H02J3/50 H02J3/48 H02J3/385 H02J3/32 H02J3/24 H02J3/1864 H02J3/1821 H02J4/00 Y02E10/763 Y10T307/549 Y02E40/30 Y02E10/58 Y02E10/566

European class: H02J3/01 H02J3/18C3A H02J3/38D1S H02J3/40 Y02E40/16 Y02E40/22 Y02E40/40 Y02E40/70

US class: 1/1 307/52 307/64 307/64P

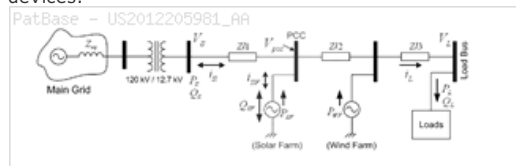
[Classification Explorer](#)

Cited documents: WO12150933 A1, WO11032265 A1, WO10119136 A1, WO10086031 A2, WO10014073 A1, WO09102842 A2, WO09033506 A1, US9166500 BB, US8391032 BB, US5913053 A, US5225712 A, US2013131884 AA, US2012205981 AA, US2011218687 AA, US2009200994 AA, US2008122518 AA, US2007135970 AA, US2007090651 AA, EP2182207 A2, EP0554804 B1, CN1738144 A, CN104104221 A, CN102640378 A, CN102301584 A, CN101725480 A, CN101647172 A, CN101330219 A,

Forward Citations: WO19149818, WO19149561, WO19009706, WO18201105, WO17131541, WO17050585, WO16182651, WO16118700, WO15081444, WO14056695, WO14056633, WO14022929, WO13163760, WO12159989, WO12159989, US9997919, US9941813, US9929665, US9920747, US9917443, US9871382, US9843189, US9841778, US9728974, US9660448, US9641114, US9640997, US9556853, US9553454, US9543859, US9502899, US9478987, US9436200, US9425621, US9362751, US9318974, US9276407, US9270164, US9231467, US9160170, US9018782, US8880229, US8624530, US8558405, US2018163716, US2018097365, US2018090936, US2017310232, US2017292498, US2017250540, US2017214271, US2016336753, US2016329709, US2016281684, US2016211743, US2016111872, US2016087439, US2016087436, US2016072290, US2016006243, US2015369217, US2015333523, US2015162750, US2015162749, US2015115721, US2015028588, US2014306534, US2014246914, US2014046500, US2014032000, US2013343104, US2013270827, US2013128630, US2012319474, US2012223577, US2012193991, US2011109085, US2011088748, US10374427, US10283254, US10273951, US10270253, US10270249, US10218175, US10211633, US10199150, US10180696, US10177574, US10158232, US10135247, US10128769, US10108153, US10097037, US10079485, US10063055, US10044315, US10008857, US10008317, US10007285, US10003196, TWI464996, NL2019182, KR101618603, JP6521325, JP2018007299, JP2015154617, FR2995474, EP3319195, EP3164925, EP3005515, EP2867970, EP2733809, EP2544326, DE102017011235, DE102015115957, DE102015115957, DE1020151122581, CN106707752, CN105794066, CN105794066, CN105703362, CN104979834, CN104979834, CN104810839, CN104756344, CN104584361, CN104104104, CN103475035, CN103475035, CN103441715, CN103441715, CN103346584, CN103346584, CN103138280, CN103138280, CN102904485, CN102510068, CN102510068,

Abstract:

The invention provides a method and system for operating a solar farm inverter as a Flexible AC Transmission System (FACTS) device-a STATCOM-for voltage control. The solar farm inverter can provide voltage regulation, damping enhancement, stability improvement and other benefits provided by FACTS devices. In one embodiment, the solar farm operating as a STATCOM at night is employed to increase the connectivity of neighbouring wind farms that produce peak power at night due to high winds, but are unable to connect due to voltage regulation issues. The present invention can also operate during the day because there remains inverter capacity after real power export by the solar farm. Additional auxiliary controllers are incorporated in the solar farm inverter to enhance damping and stability, and provide other benefits provided by FACTS devices.



4) Family number: 55372367 (CN103441715A)

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Title: CONTROL METHOD FOR CURRENT COMPENSATION OF PERMANENT MAGNET SYNCHRONOUS MOTOR

Priority: CN201310336749 20130805

Family:

Publication number	Publication date	Application number	Application date
CN103441715 A	20131211	CN201310336749	20130805
CN103441715 B	20160907	CN201310336749	20130805

Probable Assignee: SICHUAN CHANGHONG ELECTRIC CO

Assignee(s):(std): SICHUAN CHANGHONG ELECTRIC APPLIANCES CO LTD ; SICHUAN CHANGHONG ELECTRIC CO

Inventor(s):(std): PAN JUN ; TU XIAOPING ; LIU QIWU ; TANG TINGTING ; ZHAO PENGFEI ; ZHONG MING ; WANG SHENGGANG ; CHEN YUE

International class (IPC 8-9): H02P6/10 (Advanced/Invention)

[Classification Explorer](#)

Cited documents: US2012205981 AA, US2003025475 AA, CN102771043 A, CN102025157 A, CN101986497 A,

Forward Citations: CN107543640, CN105720884, CN105720884,

Abstract:

The invention relates to a control method for current compensation of a permanent magnet synchronous motor. The control method includes the steps that a. a cosine amplitude and a sine amplitude which respectively correspond to straight axis currents and quadrature axis currents are obtained through a straight axis current value and a quadrature axis current value which are set in the permanent magnet synchronous motor and a straight axis current value and a quadrature axis current value which are actually measured when the motor operates via Fourier transform and according to the current mechanical angle of a motor rotor; b. compensation values for the straight axis current value and the quadrature axis current value which are set in the permanent magnet synchronous motor are calculated to be obtained according to the cosine amplitude and the sine amplitude; c. after compensation for the compensation values for the straight axis current value and the quadrature axis current value which are set in the permanent magnet synchronous motor is carried out according to effective work efficiency sections of a compressor, a frequency converter outputs constant torque, and current fluctuation of the compressor is reduced. The control method for the current compensation of the permanent magnet synchronous motor enables the frequency converter to output the constant torque, obviously reduces the current fluctuation of the compressor, and effectively maintains system stability.

5) Family number: 30339464 (US5083039A)

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Title: VARIABLE SPEED WIND TURBINE

Priority: US19910649567 19910201 US19910799416 19911127 EP19920908256 19920131
EP19980111304 19920131 EP19980111304 19920131 WO1992US00822 19920131
WO1992US10225 19921125

Family:	Publication number	Publication date	Application number	Application date
	AU199215542 A1	19920907	AU19920015542	19920131
	AU199331488 A1	19930628	AU19930031488	19921125
	CA2100672 AA	19930715	CA19922100672	19920131
	CA2100672 C	20011211	CA19922100672	19920131
	DE69228053 D1	19990211	DE19926028053	19920131
	DE69228053 T2	19990527	DE19926028053T	19920131
	DE69233343 D1	20040513	DE19926033343	19920131
	DE69233343 T2	20050317	DE19926033343T	19920131
	DE9219171 U1	19990107	DE19920019171U	19920131
	DK0569556 T3	19990830	DK19920908256T	19920131
	DK0884833 T3	20040726	DK19920111304T	19920131
	DK0884833 T3	20040726	DK19980111304T	19920131
	EP0569556 A1	19931118	EP19920908256	19920131
	EP0569556 A4	19940330	EP19920908256	19920131
	EP0569556 B1	19981230	EP19920908256	19920131
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	EP0884833 B1	20040407	EP19980111304	19920131
	EP1432115 A2	20040623	EP20040006943	19920131
	EP1432115 A3	20060426	EP20040006943	19920131
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	ES2219807 T3	20041201	ES19980111304T	19920131
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	US5083039 B1	19991116	US19910649567	19910201
	US5225712 A	19930706	US19910799416	19911127
	WO9214298 A1	19920820	WO1992US00822	19920131
	WO9311604 A1	19930610	WO1992US10225	19921125

Probable Assignee: GENERAL ELECTRIC CO

Assignee(s):(std): US WINDPOWER ; ZOND ENERGY SYSTEMS INC ; US WINDPOWER INC ; U S WINDPOWER INC ; GEN ELECTRIC

Assignee(s): GENERAL ELECTRIC CO ; GENERAL ELECTRIC CO SCHENECTADY ; ZOND ENERGY SYSTEMS INC TEHACHAPI CALIF US ; RICHARDSON ROBERT D ; US WINDPOWER INC A CORP OF DE ; US WINDPOWER INC A DE CORP ; KENETECH WINDPOWER INC ; GENERAL ELECTRIC COMPANY ; ENRON WIND ENERGY SYSTEMS CORP ; ENRON WIND ENERGY SYSTEMS LLC ; ERDMAN WILLIAM L ; FLEET CAPITAL CORP

Inventor(s):(std): RICHARDSON ROBERT ; ERDMAN WILLIAM ; ROBERT D RICHARDSON ; WILLIAM L ERDMAN ; RICHARDSON ROBERT D ; ERDMAN WILLIAM L

Agent(s): RICHES MCKENZIE AND HERBERT LLP

Designated states: AT AU BB BE BF BG BJ BR CA CF CG CH CI CM CS DE DK ES FI FR GA GB GN GR HU IE IT JP KP KR LI LK LU MC MG ML MN MR MW NL NO PL PT RO RU SD SE SN TD TG

International class (IPC 8-9): F03D7/00 F03D7/02 F03D7/04 F03D9/00 H02J3/18 H02J3/40 H02P21/00 H02P21/06 H02P9/00 H02P9/02 H02P9/04 H02P9/42 H02P9/48 (Advanced/Invention);
F03D7/00 F03D9/00 H02J3/18 H02J3/40 H02P21/00 H02P21/06 H02P9/04 (Core/Invention)

International class (IPC 1-7): F03D7/00 F03D7/00 F03D7/02 F03D7/04 F03D9/00 H02J3/18 H02P9/00 H02P9/00 H02P9/42 H02P9/48

CPC: H02J3/386 Y02E10/563 H02J3/1842 F03D7/0272 F03D7/0276 F03D7/042 F05B2220/706 F05B2220/7064 F05B2270/1016 F05B2270/1032 F05B2270/104 F05B2270/20 F05B2270/327 F05B2270/328 F05B2270/335 H02J3/1892 H02J3/38 H02J3/40 H02M2007/53876 H02P9/04 H02P9/42 H02P9/48 H02P21/06 Y02E10/723 Y02E10/725 Y02E10/763 Y02E40/22 H02P2101/15 F03D9/255

European class: F03D7/02M F03D7/02N F03D7/04E F03D9/00C2 H02J3/18P H02J3/38 H02J3/38D1 H02J3/40 H02P21/00B H02P21/06 H02P9/04 H02P9/42 H02P9/48 R05B220/706 R05B220/7064 R05B270/1016 R05B270/1032 R05B270/104 R05B270/200 R05B270/327 R05B270/328 R05B270/335 T02M7/5387C3V T02P9/00A3 Y02E10/72F Y02E10/72H Y02E10/76B

US class: 29/44 290/1 290/44 290/55

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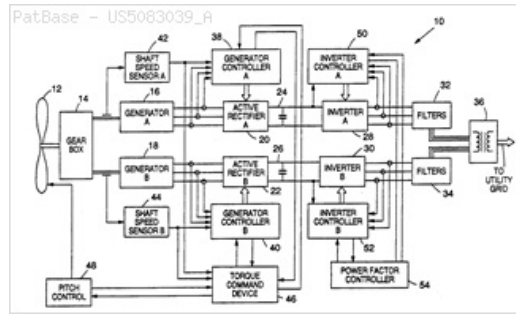
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[Classification Explorer](#)

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Forward Citations: WO9907996, WO9704521, WO9311604, WO9306653, WO9214298, WO16167816, WO16059263, WO15123650, WO15067558, WO13026583, WO13001496, WO12110979, WO12095364, WO11161692, WO11036669, WO10085987, WO10085987, WO10023285, WO10018631, WO09153614, WO09153614, WO09083447, WO09083447, WO08145778, WO08131777, WO08131777, WO08117290, WO08099055, WO08095988, WO08074996, WO08055503, WO08055503, WO08006020, WO07104585, WO07092621, WO07092621, WO07054729, WO07001416, WO07001416, WO05099063, WO05066726, WO05025026, WO05004317, WO05004317, WO04114493, WO04114493, WO04067958, WO04062080, WO04040748, WO04038892, WO04038892, WO04025799, WO04025799, WO03048568, WO03007455, WO0244560, WO0215367, WO02086315, WO02081907, WO02068818, WO0191279, WO0157396, WO0157396, WO0125628, WO0125628, WO0120745, WO0013284, WO0013284, WO0001946, US9998050, US9997923, US9920747, US9912209, US9899999, US9882502, US9856857, US9855858, US9853454, US9853306, US9825573, US9806631, US97877210, US9774198, US9768706, 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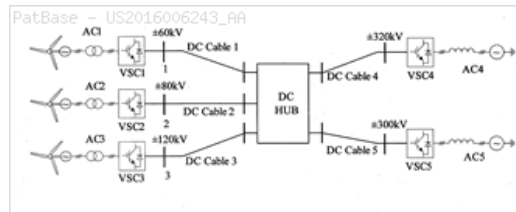
PatBase PDF Export - Page: 6 05/09/2019



6) Family number: 53556467 (US2016006243A)

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Title:	HUB																																				
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Probable Assignee:	UNIV ABERDEEN																																				
Assignee(s):(std):	UNIV ABERDEEN																																				
Assignee(s):	UNIVERSITY COURT OF THE UNIVERSITY OF ABERDEEN ; COURT OF OF ABERDEEN UNIV ; JOVCIC DRAGAN ; LIN WEIXING																																				
Inventor(s):(std):	JOVCIC DRAGAN ; LIN WEIXING																																				
Agent(s):	BRION RAFFOUL; ABLETT GRAHAM KEITH; AINSCOW GEORGINA ET AL																																				
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International class (IPC 8-9):	H02J1/10 H02J3/36 H02M3/28 (Advanced/Invention)																																				
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US class:	363/35																																				
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Forward Citations:	US9985435, US9755523, CN104967111,																																				
Abstract:	A hub for transferring power between DC systems. The hub comprises N modules, each for connection to a respective DC system of voltage Vidc and for exchanging power P1 with the respective DC system, and a common p-phase AC bus for connecting the N modules. Each module comprises a DC/AC converter for transforming the respective DC voltage Vidc into a respective p-phase AC voltage Viac of frequency ?s.																																				



7) Family number: 48874563 (US2011109085A)

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Title:	POWER OSCILLATION DAMPING EMPLOYING A FULL OR PARTIAL CONVERSION WIND TURBINE																			
Priority:	US20090615387 20091110		EP20100773805 20101027 WO2010US54247 20101027																	
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Publication number	Publication date	Application number	Application date																	
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Probable Assignee: SIEMENS GAMESA RENEWABLE ENERGY A S

Assignee(s):(std): NELSON ROBERT J ; SIEMENS AG ; SIEMENS ENERGY INC

Assignee(s): SIEMENS GAMESA RENEWABLE ENERGY A S ; SIEMENS AKTIENGESELLSCHAFT

Inventor(s):(std): NELSON ROBERT J

Agent(s): SMART AND BIGGAR; SARTOR WILLIAM DAVID ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PE PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

International class (IPC 8-9): H02J3/24 H02J3/38 H02P9/04 H02P9/10 (Advanced/Invention); H02P101/15 (Advanced/Non-invention)

CPC: H02J3/24 H02J3/386 H02P9/102 H02P2101/15 Y02E10/763

European class: H02J3/24 H02P9/10B T02J3/38D1W T02P9/00A3

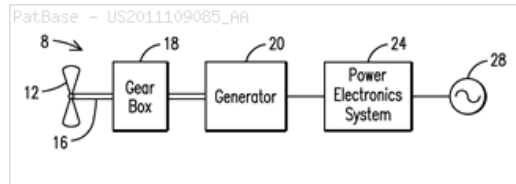
US class: 1/1 290/44 290/44P

[Classification Explorer](#)

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Forward Citations: WO13004252, WO13004252, WO11112571, US9979339, US9966888, US9932966, US9899941, US9859807, US9835136, US9647457, US9640997, US9416773, US9236742, US9133825, US2018054145, US2018026473, US2016276948, US2016010626, US2015292484, US2014361537, US2014246914, US2014232198, US2013264882, US2013027994, US2013016546, US2012306204, US10263553, US10224854, US10153719, US10141874, US10075011, EP3322061, EP3322060, EP2761713, CN104813021, CN103858301, CN103858301,

Abstract:
A wind turbine (8) for controlling power oscillations on a grid of a power system (28). The wind turbine (8) comprises rotor blades (12) for turning by the wind, an electric generator (20) rotatably coupled to the rotor blades (12), a power converter (24) responsive to electricity generated by the electric generator (20), the power converter (24) for converting the generated electricity to a frequency and voltage suitable for supply to the power grid (28), and the power converter for regulating voltage on the grid supplemented by modulating real power for damping the power oscillations.



8) Family number: 57476618 (US2015028588A)

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Title: GENERATOR SYSTEM AND METHOD OF OPERATION

Priority: US20130857854P 20130724 US20140198785 20140306 US20140498828 20140926

Family:

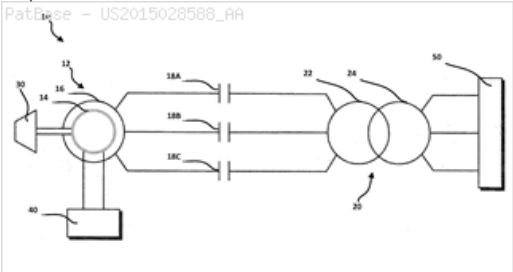
Publication number	Publication date	Application number	Application date
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US8847559 BA	20140930	US20140198785	20140306
US9641114 BB	20170502	US20140498828	20140926

Probable Assignee: HORNE ROBERT RYAN JAMESON

Assignee(s):(std): HORNE ROBERT RYAN JAMESON

Inventor(s):(std): HORNE ROBERT RYAN JAMESON
Agent(s): GILBERTS LLP; MATTHEW D
International class (IPC 8-9): F02D29/06 F03B13/10 F03B15/08 H02P11/00 H02P9/02 H02P9/04 H02P9/46 (Advanced/Invention); H02J11/00 H02J9/00 (Advanced/Non-invention)
CPC: H02P9/02 H02P9/46
US class: 290/7 307/105 322/25
[Classification Explorer](#)
Cited documents: US9325173 BB, US8643215 BB, US8228645 BB, US8106540 BB, US7576443 BB, US7439714 BB, US7053590 BB, US7042110 BB, US6815934 BB, US6465979 BA, US5949190 A, US5406190 A, US4532465 A, US4339704 A, US3932765 A, US2016197482 AA, US2014246914 AA, US2013181688 AA, US2013082467 AA, US2012205981 AA, US2012201060 AA, US2011187105 AA, US2010253094 AA, US2006214643 AA, US2006043940 AA, US2003222459 AA, JP1218358 A2,
Forward Citations: US2017310260, US10243495,

Abstract:
A generator system includes an AC generator having one or more phases; a transformer having the same number of phase as the generator; for each phase of the AC generator, a capacitive element having a first terminal electrically connected to an output winding of the AC generator and a second terminal electrically connected to a primary winding of a respective phase of the transformer; a prime mover in driving engagement with the AC generator; and a load connected to a secondary winding of the transformer. A method to reduce the mechanical input to the AC generator includes reducing the counter torque of the generator system via a respective series connected capacitive element having a first terminal electrically connected to the output winding of the AC generator and a second terminal electrically connected to a primary winding of a respective phase of the transformer.



9) Family number: 57222680 (US2015369217A) © PatBase

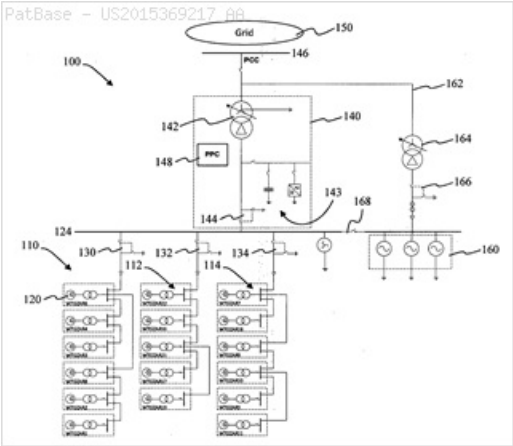
Title: A METHOD OF OPERATING A WIND TURBINE PLANT
Priority: EP20130706162 20130215 WO2013DK50039 20130215
Family:

Publication number	Publication date	Application number	Application date
CN104995812 A	20151021	CN201380073041	20130215
CN104995812 B	20170919	CN201380073041	20130215
DE602013020563 D1	20170614	DE201360020563T	20130215
EP2957012 A1	20151223	EP20130706162	20130215
EP2957012 B1	20170503	EP20130706162	20130215
IN06745DN2015 A	20160722	IN2015DN06745	20150731
US2015369217 AA	20151224	US20130765938	20130215
US9556853 BB	20170131	US20130765938	20130215
WO14124644 A1	20140821	WO2013DK50039	20130215

Probable Assignee: VESTAS WIND SYSTEMS A S
Assignee(s):(std): VESTAS WIND SYS AS
Assignee(s): VESTAS WIND SYSTEMS A S ; VESTAS WIND SYSTEMS AS
Inventor(s):(std): GUPTA AMIT KUMAR ; GUPTA MANOJ ; GURU DILIP KUMAR
Agent(s): VESTAS PATENTS DEPARTMENT; PATTERSON AND SHERIDAN LLP
Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

International class (IPC 8-9): F03D7/02 F03D9/00 G05B23/02 H01H71/10 H01H81/00 H02H3/00 H02H3/02 H02H3/08 H02H7/093 H02H7/30 H02J3/16 H02J3/18 H02J3/38 H02P9/00 (Advanced/Invention); H02H7/30 (Advanced/Non-invention)
CPC: F03D7/0272 H02P9/006 G05B23/0235 H01H71/10 H01H81/00 H02H3/025 H02H3/08 H02H7/093 H02J3/381 H02J3/382 H02H7/30 H02J3/16 H02J3/386 Y02E10/763 Y02E40/34 F03D9/257 H02H3/006 F03D7/048
US class: 1/1 290/44
[Classification Explorer](#)
Cited documents: US9325173 BB, US8131401 BB, US7800877 BB, US7447568 BB, US2015236497 AA, US2014306533 AA, US2013015660 AA, US2013015660 AA, US2012248772 AA, US2012248772 AA, US2012191440 AA, US2011282507 AA, US2011043186 AA, US2011043186 AA, EP2481915 A1, EP2481915 A1, DE102009038209 A1, CN102570496 A,
Forward Citations: WO16062316, US9997919, US9970417, US9866063, US2017292498, US2016072290, US2015361954, US10352301, US10333342, US10305282, US10042374, CN104836503, CN104836503,

Abstract:
A method of operating a wind turbine plant is provided. Such a wind turbine plant comprises at least one transmission branch comprising a plurality of wind turbine generators and coupled to an electrical grid at a point of common coupling through at least one circuit breaker comprising a breaking capacity. The method comprises monitoring the electrical grid for a low voltage fault event; and if a low voltage fault event is detected: calculating a grid short circuit strength, determining a short circuit current limit if the grid short circuit strength requires an initial fault current contribution which exceeds the breaking capacity of the circuit breaker to be passed through the circuit breaker, determining a maximum fault current contribution based on the short circuit current limit and operating the wind turbine generators to provide to the electrical grid the maximum fault current contribution.



10) Family number: 52413797 (US2012299305A)

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Title: METHOD AND SYSTEM FOR OPERATING AND CONTROLLING A WIND TURBINE TO PREVENT EXCITATION OF SUBSYNCHRONOUS OSCILLATIONS WITHIN THE WIND TURBINE
Priority: US20110116806 20110526

Family:	Publication number	Publication date	Application number	Application date
	US2012299305 AA	20121129	US20110116806	20110526
	US8558405 BB	20131015	US20110116806	20110526
	WO12159989 A2	20121129	WO2012EP59264	20120518
	WO12159989 A3	20130117	WO2012EP59264	20120518

Probable Assignee: SIEMENS GAMESA RENEWABLE ENERGY A S
Assignee(s):(std): BROGAN PAUL BRIAN ; NELSON ROBERT J ; SIEMENS AG
Assignee(s): SIEMENS AKTIENGESELLSCHAFT ; SIEMENS GAMESA RENEWABLE ENERGY A S
Inventor(s):(std): BROGAN PAUL BRIAN ; NELSON ROBERT J
Agent(s): SIEMENS AKTIENGESELLSCHAFT
Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PE PG PH PL PT QA RO RS RU RW SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

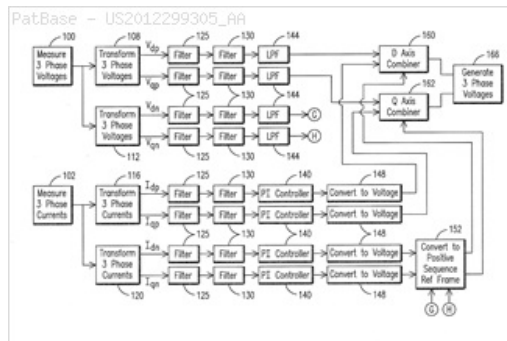
International class (IPC 8-9): F03D9/00 G05F1/70 H02J3/18 H02J3/38 (Advanced/Invention)

CPC: Y02E10/763 Y02E40/30 H02J3/386 H02J3/1807
European class: H02J3/18 H02J3/38D1W
US class: 290/55 323/207

[Classification Explorer](#)

Cited documents: WO11032265 A1, WO10121784 A1, US5513090 A, US5227713 A, US5083039 A, US4438386 A, US2011248569 AA, US2011101689 AA, US2011057446 AA, US2010327584 AA, US2010133915 AA, US2010090538 AA, US2010090537 AA, US2009134850 AA, US2008205093 AA, US2007121354 AA, US2005207190 AA,
Forward Citations: WO16124797, US9941828, US9941813, US9859806, US9806690, US9735581, US9500182, US9461572, US9391554, US9318974, US9270194, US9178357, US8693220, US8476779, US2015365031, US2015308412, US2015260162, US2015221203, US2014307488, US2014246914, US2013343111, US2013325373, US2013107586, US2013016546, US2012056602, US2011049890, US10359473, US10063174, EP3282538, EP3264593, EP3264593, EP3065251, CN107565871, CN106356874, CN106356874, CN105932916, CN105826935, CN105826935, CN104934992, CN104912736, CN104912736,

Abstract:
A full converter connected to a series compensated transmission line. The full converter comprises a generator side converter, a DC link connected across an output of the generator side converter, a line side converter connected across an output of the DC link, and a converter controller configured to control the full converter to mitigate effects of subsynchronous oscillations present on the series compensated transmission line.



11) Family number: 43215985 (US2009114263A)

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Title: APPARATUSES AND METHODS TO REDUCE SAFETY RISKS ASSOCIATED WITH PHOTOVOLTAIC SYSTEMS

Priority: US20070001587P 20071102 US20080254780 20081020 WO2008US81827 20081030
US20080200601P 20081202 US20090366597 20090205 US20090411317 20090325
US20090275977P 20090903 US20090276753P 20090916 US20090628977 20091201
US20100343155P 20100422 US20100948614 20101117 US20110092783 20110422
WO2011US33658 20110422 US20140473659 20140829 US20140572458 20141216
US20160203713 20160706 US20170717244 20170927 US20190293514 20190305
US20190389775 20190419

Family:	Publication number	Publication date	Application number	Application date
	AU2008318625 AA	20090507	AU20080318625	20081030
	CN101849292 A	20100929	CN200880114564	20081030
	CN101849292 B	20130710	CN200880114564	20081030
	EP2206159 A2	20100714	EP20080845104	20081030
	EP2206159 A4	20140903	EP20080845104	20081030
	EP2561596 A2	20130227	EP20110772811	20110422
	EP2561596 A4	20150114	EP20110772811	20110422
	EP2561596 B1	20190522	EP20110772811	20110422
	IL205312 A0	20101230	IL20080205312	20081030
	IN02577CN2010 A	20101022	IN2010CN02577	20100430
	JP2011503846 T2	20110127	JP20100532249T	20081030
	KR20100093072 A	20100824	KR20107011971	20081030
	US2009114263 AA	20090507	US20080254780	20081020
	US2009133736 AA	20090528	US20090366597	20090205
	US2010139734 AA	20100610	US20090628977	20091201
	US2011061713 AA	20110317	US20100948614	20101117
	US2011218687 AA	20110908	US20110092783	20110422
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	US2015101651 AA	20150416	US20140572458	20141216
	US2016315585 AA	20161027	US20160203713	20160706
	US2018019705 AA	20180118	US20170717244	20170927
	US2019207556 AA	20190704	US20190293514	20190305
	US2019253022 AA	20190815	US20190389775	20190419
	US7807919 BB	20101005	US20090366597	20090205
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	US8823218 BB	20140902	US20110092783	20110422
	US8933321 BB	20150113	US20090628977	20091201
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	US9813021 BB	20171107	US20160203713	20160706
	US10256770 BB	20190409	US20170717244	20170927
	US10312857 BB	20190604	US20140572458	20141216
	WO09059028 A2	20090507	WO2008US81827	20081030
	WO09059028 A3	20090806	WO2008US81827	20081030
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	WO11028457 A3	20110616	WO2010US46274	20100823
	WO11133928 A2	20111027	WO2011US33658	20110422
	WO11133928 A3	20120518	WO2011US33658	20110422

Probable Assignee: TIGO ENERGY INC

Assignee(s):(std): ARDITI SHMUEL ; BICKFORD JAMES ; DAN KIKINIS ; EARL G POWELL ; HADAR RON ; KIKINIS DAN ; POWELL EARL G ; RON HADAR ; SHMUEL ARDITI ; TIGO ENERGY ; TIGO ENERGY INC

Assignee(s): WESTERN ALLIANCE BANK

Inventor(s):(std): POWELL EARL G ; KIKINIS DAN ; HADAR RON ; ARDITI SHMUEL ; BICKFORD JAMES ; SHMUEL ARDITI ; DAN KIKINIS ; RON HADAR

Inventor(s): EARL G POWELL

Agent(s): FB RICE ; FB RICE PTY LTD ; CORDINA KEVIN JOHN; Derry Paul Stefan; DERRY PAUL STEFAN; GREENBERG TRAUIG LLP SV IP DOCKETING; GREENBERG TRAUIG LLP; WANG LEHUA; WARD JOHN P; TICHANE DAVID M

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PE PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

International class (IPC 8-9): G01R31/00 G01R31/40 G05F3/06 G06F1/28 H01L31/00 H01L31/02 H01L31/042 H01L31/048 H01L31/05 H01L31/052 H02J13/00 H02J3/38 H02J7/35 H02S40/32 H02S40/34 H02S50/00 H02S50/10 (Advanced/Invention); H01L31/042 H02J1/00 H02S50/00 H02S50/15 (Advanced/Non-invention); H01L31/042 H01L31/05 (Core/Invention); H01L (Subclass/Invention)

International class (IPC 1-7): H01L31/042

CPC: H02S50/00 G01R31/00 H02S40/32 H01L31/052 H01L31/02021 H04B2203/5458 Y02E10/50 H02J3/385 H02S50/10 H01L31/0485 H02S50/15 H02S40/34

European class: H01L31/02H2B H01L31/048C T04B203/54P14 Y02E10/50 Y02E10/56D Y02E40/72 Y04S10/12B

US class: 1/1 136/243 136/244 136/245 136/246 136/247 136/248 136/250 136/251 200/506 307/151 307/86 439/135 439/150 439/152 439/160 700/292 700/292P

JP class F-Term: 5F051 5F151 5F151/JA07 5F151/JA12 5F151/JA27 5F151/JA30

JP class F-Index: H01L31/04/R H02S40/30 H02S40/32 H02S40/34

[Classification Explorer](#)

Cited documents: WO10037393 A1, WO09006879 A2, WO09006879 A2, WO08077473 A2, WO08077473 A2, WO07048421 A2, WO05112551 A2, WO05069096 A1, WO03012569 A1, US9813021 BB, US9768725 BB, US9590526 BB, US9543890 BB, US9438035 BB, US9401599 BB, US9397612 BB, US9377765 BB, US9112379 BB, US8947194 BB, US8933321 BB, US8933320 BB, US8854193 BB, US8828778 BB, US8823218 BB, US8816535 BB, US8669675 BB, US8587151 BB, US8563847 BB, US8531055 BB, US8427009 BB, US8212139 BB, US8035249 BB, US8013472 BB, US7884278 BB, US7807919 BB, US7719140 BB, US7605498 BB, US7602080 BA, US7595616 BB, US7545053 BB, US7538451 BB, US7518346 BB, US7518266 BB, US7516106 BB, US7462955 BB, US7394237 BB, US7336004 BB, US7276886 BB, US7259474 BB, US7256566 BB, US7248946 BB, US7150938 BB, US7061214 BB, US6984970 BB, US6946753 BB, US6897370 BB, US6894911 BB, US6844739 BB, US6837739 BB, US6819011 BB, US6763226 BA, US6713890 BB, US6653549 BB, US6650031 BA, US6593520 BB, US6545211 BA, US6515215 BA, US6448489 BB, US6396239 BA, US6350944 BA, US6275016 BA, US6101073 A, US6093885 A, US6031736 A, US5932994 A, US5923158 A, US5801519 A, US5747967 A, US5648731 A, US5604430 A, US5504418 A, US5472614 A, US5280133 A, US5268832 A, US5235266 A, US5143556 A, US5027051 A, US4873480 A, US4604567 A, US4580090 A, US2018351365 AA, US2018019705 AA, US2017085094 AA, US2016315585 AA, US2016301214 AA, US2015101651 AA, US2015053250 AA, US2015047689 AA, US2015028692 AA, US2014035373 AA, US2012234374 AA, US2011218687 AA, US2011172842 AA, US2011068702 AA, US2011061713 AA, US2010326809 AA, US2010321148 AA, US2010300508 AA, US2010283612 AA, US2010282293 AA, US2010139734 AA, US2010139734 AA, US2010132758 AA, US2010131108 AA, US2010085670 AA, US2010085670 AA, US2010071274 AA, US2010057267 AA, US2009242011 AA, US2009207543 AA, US2009207543 AA, US2009183763 AA, US2009183760 AA, US2009182532 AA, US2009179662 AA, US2009179662 AA, US2009141522 AA, US2009133736 AA, US2009114263 AA, US2009114263 AA, US2009066357 AA, US2009066357 AA, US2009018376 AA, US2008303503 AA, US2008236648 AA, US2008191675 AA, US2008191560 AA, US2008179949 AA, US2008164766 AA, US2008164766 AA, US2008147335 AA, US2008147335 AA, US2008142071 AA, US2008122518 AA, US2008122449 AA, US2008121272 AA, US2008036440 AA, US2007273351 AA, US2007229237 AA, US2007019613 AA, US2006231132 AA, US2006185727 AA, US2006174939 AA, US2006001406 AA, US2005172995 AA, US2005057215 AA, US2005057214 AA, US2004056768 AA, US2001023703 AA, US10063056 BB, US10063056 B2, KR200402282 Y1, KR200402282, KR20040002282 A, KR100912892 B1, KR100912892, KR100725755 B1, KR100725755, JP9148611 A2, JP8316517 A2, JP8116628 A2, JP8097460 A2, JP6125104 A2, JP5218481 A2, JP4219982 A2, JP3048611 A2, JP2003134661 A2, JP2003134661 A1, JP2001189476 A2, JP2000358330 A2, JP2000023365 A2, JP11103538 A2, ES2249147 AA, EP2495766 A1, EP2495766 A1, EP1388774 A1, EP0178757 A2, DE4232356 A1, DE19961705 A1, DE1232356 B,

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AU2005262278 AA,

Forward Citations: WO17051097, WO16189343, WO16189342, WO16123305, WO16032484, WO15087638, WO13122685, WO13121003, WO13121003, WO13064666, WO13034336, WO13026539, WO12162039, WO12149387, WO12147058, WO12104335, WO12073190, WO12073190, WO12069044, WO12031662, WO11063803, WO11028457, WO11028457, USRE46561, US9997106, US9991717, US9979280, US9978310, US9966766, US9960732, US9960731, US9960667, US9948233, US9947820, US9941813, US9941421, US9935458, US9923516, US9922596, US9886899, US9881587, US9877371, US9876466, US9876464, US9876430, US9869701, US9867257, US9866098, US9853565, US9853538, US9853490, US9843193, US9831824, US9824632, US9819178, US9813021, US9812984, US9805653, US9791835, US9780253, US9748897, US9748896, US9741292, US9735777, US9721505, US9697771, US9680304, US9673711, US9673630, US9659527, US9647442, US9644993, US9639106, US9620956, US9590526, US9571032, US9548619, US9543889, US9537445, US9489891, US9478967, US9466737, US9442504, US9438037, US9407161, US9401599, US9401451, US9397612, US9397497, US9377765, US9370075, US9369126, US9368964, US9362743, US9351368, US9347689, US9331488, US9330598, US9325166, US9318974, US9291696, US9269322, US9263183, US9262965, US9257916, US9235228, US9231126, US9190927, US9153709, US9153172, US9130401, US9124139, US9112379, US9105765, US9093902, US9093028, US9088178, US9058775, US9030506, US9007210, US8994617, US8933321, US8928175, US8860636, US8859884, US8854193, US8823218, US8773236, US8723370, US8599587, US8482153, US8461813, US8461811, US8456876, US8304932, US8242634, US8179147, US8093756, US8004116, US7919953, US7884278,

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Abstract:

Apparatuses and methods to reduce safety risks associated with photovoltaic systems by providing a safety switch on a photovoltaic panel. In one embodiment, a photovoltaic panel includes: at least one photovoltaic cell; a connector to output energy from the photovoltaic panel; and a switch coupled between the at least one photovoltaic cell and the connector. The switch is configured to disconnect the at least one photovoltaic cell from the connector during installation of the photovoltaic panel, and to connect the at least one photovoltaic cell with the connector after installation of the photovoltaic panel.

