

1) Family number: 30282794 (US2004027750A)

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Title: DIGITAL PROTECTION AND CONTROL DEVICE

Abstract: A digital protection and control device is so configured that at least parts of a digital data merging unit coupled to sensor units by a transmission medium, a protection and control unit, a communication unit for component control devices coupled to component control devices by a transmission medium, and a process bus communication unit are coupled by a parallel transmission medium, and at least a part of data exchange is based on a multimaster mode. Transmission based on the multimaster mode enables each unit to transmit/receive data independently and enables the reduction in unbalanced communication load. As a result, such a risk can be reduced that time responsiveness of operation is lowered as the entire digital protection and control device due to unbalanced concentration of data bus processing in a particular unit.

Classifications:

International (IPC 8-9): G05B19/418 G05B23/00 H02H1/00 H02H3/02 H02J13/00 H02J3/00 (Advanced/Invention); G05B19/418 G05B23/00 H02H1/00 H02H3/02 H02J13/00 H02J3/00 (Core/Invention)

International (IPC 1-7): G05B023/00 G05B23/00 G05D3/12 H02H3/00 H02H3/02 H02J13/00 H02J3/00

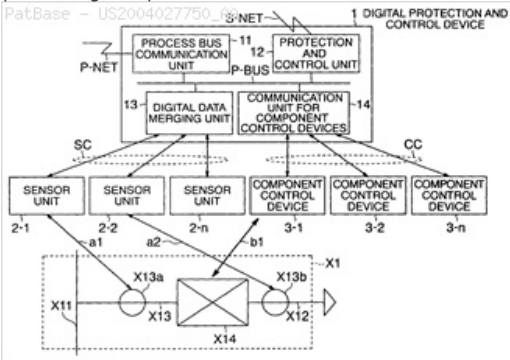
CPC: H02H1/0061 Y02E60/723 Y02E60/74 Y04S10/16 Y04S10/30 Y04S10/20 Y02E60/725

European: H02H1/00E Y02E60/72F Y02E60/74 Y04S10/16 Y04S10/30

US: 361/62 700/292 700/295 702/57 702/60 702/62 702/65 702/72 702/79

JP F-Term: 5G042 5G064 5G064/AB03 5G064/AC05 5G064/AC08 5G064/CB06 5G064/CB10 5G064/CB16 5G064/DA01 5G066 5G066/AA09 5G066/AE03 5G066/AE09 5G142 5G142/BC02 5G142/BD03

JP F-Index: H02H3/02/D H02J13/00/301/A H02J13/00/311/R H02J3/00/K H02H3/02/J



Family:

Publication number	Publication date	Application number	Application date
AU2003204982 AA	20040226	AU20030204982	20030626
AU2003204982 BB	20050414	AU20030204982	20030626
CN1272680 C	20060830	CN20031027519	20030806
CN1484120 A	20040324	CN20031027519	20030806
FR2843639 A1	20040220	FR20030009644	20030805
FR2843639 B1	20060407	FR20030009644	20030805
JP2004072905 A2	20040304	JP20020229102	20020806
JP2007151394 A2	20070614	JP20070025401	20070205
JP3930394 B2	20070613	JP20020229102	20020806
JP4227177 B2	20090218	JP20070025401	20070205
US2004027750 AA	20040212	US20030608377	20030630
US6954704 BB	20051011	US20030608377	20030630

Priority:

JP20020229102 20020806 JP20070025401 20070205

Probable Assignee: TOSHIBA KK

Assignee(s): (std): TOSHIBA CORP ; TOSHIBA KK

Assignee(s): K USHIKI KAISHA TOSHIBA AB ; KABUSHIKI KAISHA TOSHIBA ; TOSHIBA K K

Inventor(s): (std): MINAMI YUUI ; SUGA NORIYOSHI ; NAGASAKI HIROMI ; MINAMI YUJI ; YUUI MRNAMI ; YUUI MINAMI ; NORIYOSHI SUGA ; MRNAMI YUUI ; HIROMI KOSAKADA MASAYUKI MRNAM ; HIROMI NAGASAKI ; KOSAKADA MASAYUKI ; KOSAKATA MASAYUKI ; MASAYUKI KOSAKADA

Inventor(s): KOSAKADA MASAYUKI MRNAMI YUUI NAGASAKI HIROMI

Agent(s): GRIFFITH HACK; SUYAMA SAICHI; OBLON SPIVAK MCCLELLAND MAIER AND NEUSTADT PC

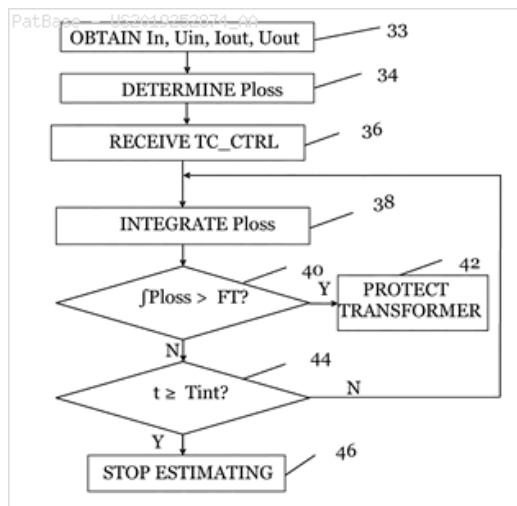
2) Family number: 68630033 (US2019252874A)

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Title: PROTECTING A TRANSFORMER COMPRISING A TAP CHANGER

Abstract: The invention is concerned with a protection device, method and computer program product for protecting a transformer including a tap changer and a transformer arrangement including a transformer and a protection device. The transformer has at least two magnetically coupled windings with terminals (MT1, MT2, MT3, MT4) at which power enters and exits the transformer and a tap changer having impedance elements and a switch configured to gradually connect the impedance elements when changing between two tap changer positions during a tap changing operation. The method is performed in the protection device and includes: obtaining measurements of power transmission properties (Iin, Uin, Iout, Uout) at the magnetically coupled windings, estimating energy deposited in the impedance elements during a tap changing operation based on the measured physical properties, comparing the estimated deposited energy with a failure threshold, and protecting the transformer in case the threshold is exceeded, wherein the estimating of the deposited energy includes determining the power loss of the transformer between the terminals (MT1, MT2) where power enters and the terminals (MT3, MT4) where power leaves the transformer and integrating the power loss.

Classifications:
International (IPC 8-9): H01F27/28 H02H7/055 (Advanced/Invention)
International (IPC 1-7): H02H7/055
CPC: H02H7/055



Family:

Publication number	Publication date	Application number	Application date
BR112019002739 A2	20190514	BR20191102739	20170815
CA3033690 AA	20190212	CA20173033690	20170815
CA3033690 C	20190730	CA20173033690	20170815
CN109643888 A	20190416	CN201780050371	20170815
DE602016010934 D1	20190404	DE201660010934T	20160816
EP3285349 A1	20180221	EP20160184245	20160816
EP3285349 B1	20190313	EP20160184245	20160816
KR102038259 B1	20191126	KR20197007688	20170815
KR20190032622 A	20190327	KR20197007688	20170815
US2019252874 AA	20190815	US20170326020	20170815
US10389107 BA	20190820	US20170326020	20170815
WO18033532 A1	20180222	WO2017EP70663	20170815

Priority:

EP20160184245 20160816 WO2017EP70663 20170815

Probable Assignee: ABB SCHWEIZ AG

Assignee(s): (std): ABB SCHWEIZ AG

Assignee(s): ABEYWICKRAMA NILANGA ; BENGTSOON TORD

Inventor(s): (std): NILANGA ABEYWICKRAMA ; TORD BENGTSOON ; ABEYWICKRAMA NILANGA ; BENGTSOON TORD

Agent(s): MARKS AND CLERK; SAVELA REINO ALEKSI; WHITMYER GROUP LLC; SAVELA REINO

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 DJ 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 JO JP KE KG KH KM KN KP KR KW 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

3) Family number: 55473733 (US2014002937A)

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Title: DIFFERENTIAL PROTECTION IN ELECTRICAL POWER NETWORKS

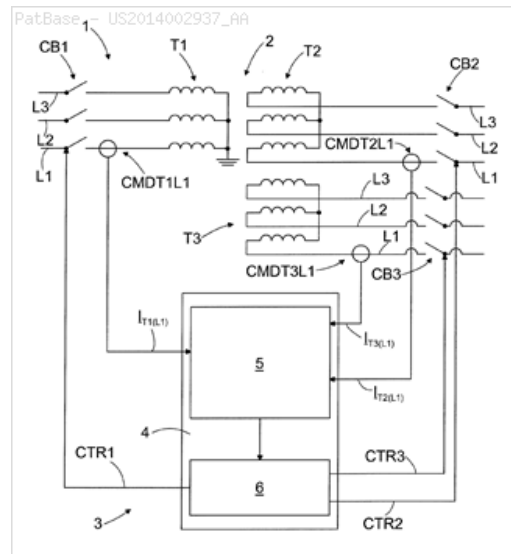
Abstract: A method in a three-terminal differential protection includes measuring a terminal phase current (IT1(y), IT2(y), IT3(y)) at each terminal (T1, T2, T3) of a protected zone of the differential protection in each phase (L1, L2, L3) to be protected, and determining a bias current (Ib(y)) of the phase on the basis of the terminal phase currents (IT1(y), IT2(y), IT3(y)). The bias current determination includes subtracting phasor values of the terminal phase currents of two terminals from the phasor value of the terminal phase current of one terminal. The terminal phase current, which is a minuend in the phasor difference computation, is selected on the basis of the phase angles or amplitudes of the terminal phase currents.

Classifications:

International (IPC 8-9): H02H3/26 H02H3/28 H02H3/34 H02H3/347 H02H7/045 H02H7/26 (Advanced/Invention)

CPC: H02H3/343 H02H3/347 H02H7/045 H02H3/283 H02H7/0455

US: 1/1 361/76



Family:

Publication number	Publication date	Application number	Application date
CN103532108 A	20140122	CN201310268676	20130628
CN103532108 B	20160518	CN201310268676	20130628
DE602012017247 D1	20160602	DE201260017247T	20120629
EP2680385 A1	20140101	EP20120174387	20120629
EP2680385 A9	20140305	EP20120174387	20120629
EP2680385 B1	20160420	EP20120174387	20120629
US2014002937 AA	20140102	US20130929112	20130627
US9106076 BB	20150811	US20130929112	20130627

Priority:

EP20120174387 20120629

Probable Assignee: ABB SCHWEIZ AG

Assignee(s): (std): ABB TECHNOLOGY AG

Assignee(s): ABB SCHWEIZ AG

Inventor(s): (std): TAUSA MIKA ; VANHALA KARI

Agent(s): KOLSTER OY AB; BUCHANAN INGERSOLL AND ROONEY PC

Designated states: AL AT BA BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL NO PL PT RO RS SE SI SK SM TR

4) Family number: 34108747 (US2009216573A)

PatBase

Title: METHOD AND DEVICE FOR AUTOMATIC EVENT DETECTION AND REPORT GENERATION

Abstract: A robot controller including a control unit and a portable operating device (TPU) for teaching and manually operating the robot. The TPU includes safety equipment, a safety TPU-part having a first communication unit and a main TPU-part having a third communication unit. The control unit includes a safety control part having a second communication unit and a main control part having a forth communication unit. The first and second communication units are arranged such that they form a first communication channel for transferring communication data including information regarding the status of safety equipment from the TPU to the control unit. The third and fourth communication units are arranged such that they form a second communication channel for transferring general communication data between the TPU and the control unit. Each of the main TPU-part, the safety TPU-part, the main control part, and the safety control part includes a central processing unit adapted for generating and/or handling the communication data. Each of the communication units is connected to a network. Each of the communication units forms a node in the network.

Classifications:

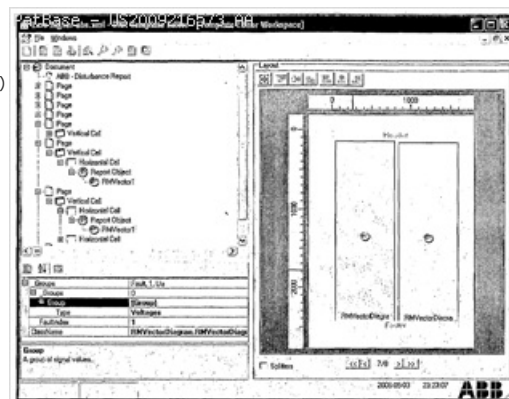
International (IPC 8-9): G01R31/00 G05B G05B23/02 G06F19/00 G06Q G06Q10/00 G06Q50/00 H02J13/00 (Advanced/Invention); G01R31/00 G05B23/02 G06F19/00 G06Q10/00 G06Q50/00 (Core/Invention)

International (IPC 1-7): G05B23/02

CPC: G05B23/0272 G06Q10/06 H02J13/001 Y02E60/74 Y04S10/30 Y04S10/40 Y04S10/522

European: G05B23/02S6F4 G06Q10/06 T02J13/00F2 Y02E60/74 Y04S10/30 Y04S10/40 Y04S10/60

US: 702/58 702/58S 702/60 702/60P 705/7 705/7P



Family:

Publication number	Publication date	Application number	Application date
CN101563662 A	20091021	CN200680014998	20060504
EP1883875 A2	20080206	EP20060795550	20060504
EP1883875 A4	20101208	EP20060795550	20060504
HK1112075 A1	20080822	HK20080107006	20080624
HK1112075 A3	20080822	HK20080107006	20080624
IN04972CN2007 A	20080627	IN2007CN04972	20071105
RU2007144815 A	20090610	RU20070144815	20060504
US2009216573 AA	20090827	US20060919908	20060504
WO07007200 A2	20070118	WO2006IB02652	20060504
WO07007200 C1	20080529	WO2006IB02652	20060504

Priority:

US20050677341 20050504 US20050677341P 20050504 US20060919908 20060504
WO2006IB02652 20060504

Probable Assignee: ABB TECHNOLOGY LTD

Assignee(s): (std): ABB RESEARCH LTD ; ABB TECHNOLOGY AG ; ABB TECHNOLOGY LTD ; FRISK LARS ; HEIBERG ANDERSEN JAN ; LUNDQVIST BERTIL

Inventor(s): (std): LUNDQVIST BERTIL ; HEIBERG ANDERSEN JAN ; FRISK LARS ; LARS FRISK ; BERTIL LUNDQVIST

Inventor(s): HEIDBERG ANDERSON JAN

Agent(s): KOCK INA; CHINAHK INTELLECTUAL PROPERTY SERVICES CO LTD; VENABLE LLP

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

5) Family number: 31428345 (US2004264094A)

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Title: PROTECTIVE CONTROL METHOD AND APPARATUS FOR POWER DEVICES

Abstract: A protective control apparatus and method is disclosed for protecting the operation of a power device upon detection of an internal fault condition. The power device has a circuit breaker for connecting the power device to a power supply. The protective control apparatus comprises a current measuring unit operatively connected to the power device for measuring currents within the power device and a protective relay processing unit connected to the current measuring unit for receiving the measured currents and connected to the circuit breaker for providing a control signal thereto. The protective relay processing unit performs a multi-resolution analysis of the measured currents preferably using Wavelet Packet Transform decomposition, to detect the internal fault condition, and upon detection of the internal fault condition, provides a control signal to disable the circuit breaker.

Classifications:

International (IPC 8-9): H02H7/045 (Advanced/Invention);

H02H1/00 (Advanced/Non-invention);

H02H7/04 (Core/Invention);

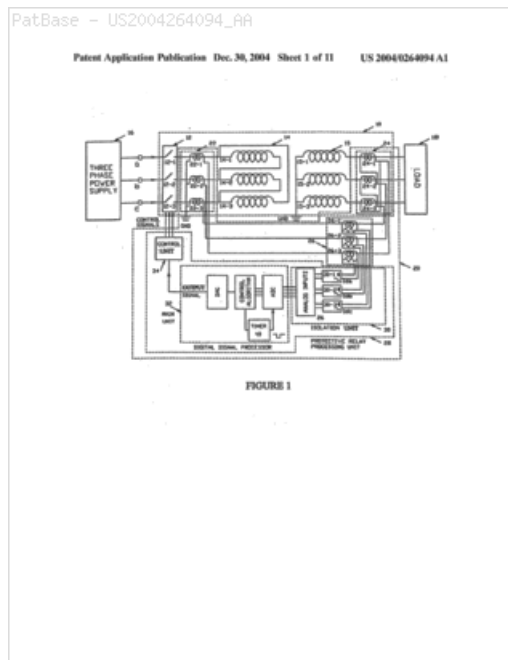
H02H1/00 (Core/Non-invention)

International (IPC 1-7): H02H7/04

CPC: H02H1/0092 H02H7/0455

European: H02H7/045B T02H1/00F

US: 361/115



Family:

Publication number	Publication date	Application number	Application date
US2004264094 AA	20041230	US20040839376	20040506

Priority:

US20030468067P 20030506 US20040839376 20040506

Probable Assignee: GENESIS GROUP INC

Assignee(s): (std): RAHMAN MD AZIZUR ; SALEH SALEH ABED AL AZIZ MOHAM

Assignee(s): SALEH SALEH ABED AL AZIZ MOHAMMED ; GENESIS GROUP INC
Inventor(s): (std): RAHMAN MD AZIZUR ; SALEH SALEH ABED AL AZIZ MOHAM
Inventor(s): SALEH SALEH ABED AL AZIZ MOHAMMED

6) Family number: 75119640 (IN201721034866A)

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Title: A TRANSFORMER FAULT DETECTION DEVICE

Abstract: A transformer fault detection device is disclosed. The device comprises a plurality of sensors 1, 2, and 3 provided near the bottom, in the middle and near the top end of a tank 4, of a transformer, provided to accommodate coils of the transformer and transformer oil therein. A control unit 7 provided in an insulated box 8 is provided to receive signals from the sensors, analyzing the signals and comparing the signals continuously with the reference signals relating to (a) abnormal operation of the transformer, (b) sledging in the transformer oil, (c) internal short circuits, and (d) oil level reduction in order to determine the fault to be rectified and send info to connected distribution centre and to the people present at the distribution centre. A server is provided to store the information, about the fault, for the future use.

Classifications:

International (IPC 8-9): H01F27/00 (Advanced/Invention)

Family:

Publication number	Publication date	Application number	Application date
IN201721034866 A	20190712	IN201721034866	20171002

Priority:

IN201721034866 20171002

Probable Assignee: AISECT UNIV

Assignee(s): AISECT UNIV

Inventor(s): ANURAG SHOBHA DEENDAYAL RAI ; REETA PAWAR ; PRITI MAHESHWARY

7) Family number: 58500862 (IN01858DE2013A)

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Title: DIFFERENTIAL PROTECTION IN ELECTRICAL POWER NETWORKS

Abstract: A method in a three-terminal differential protection comprises measuring a terminal phase current ($I_{T1(y)}$, $I_{T2(y)}$, $I_{T3(y)}$) at each terminal (T1, T2, T3) of a protected zone of the differential protection in each phase (L1, L2, L3) to be protected and determining a bias current ($I_{b(y)}$) of the phase on the basis of the terminal phase currents ($I_{T1(y)}$, $I_{T2(y)}$, $I_{T3(y)}$). The bias current determination comprises subtracting phasor values of the terminal phase currents of two terminals from the phasor value of the terminal phase current of one terminal. The terminal phase current being a minuend in the phasor difference computation is selected on the basis of the phase angles or amplitudes of the terminal phase currents.

Classifications:

International (IPC 8-9): H02H3/00 (Advanced/Invention)

Family:

Publication number	Publication date	Application number	Application date
IN01858DE2013 A	20150213	IN2013DE01858	20130624

Priority:

GB20120074387 20120629

Probable Assignee: ABB TECHNOLOGY AG

Assignee(s): ABB TECHNOLOGY AG

Inventor(s): VANHALA KARI ; TAUSA MIKA

8) Family number: 47337246 (US2010264749A)

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Title: DIFFERENTIAL ELEMENT WITH HARMONIC BLOCKING AND HARMONIC RESTRAINT OPERATING IN PARALLEL

Abstract: An intelligent electronic device (IED) provides harmonic blocking and harmonic restraint differential protection operating in parallel. The IED includes a harmonically-blocked differential element supervised by one or more even harmonics of a raw operating current (a current comprising the fundamental operating current and the harmonics thereof). The IED also includes a parallel, harmonically-restrained differential element, which is restrained by harmonics of the raw operating current. Tripping signals output by the parallel harmonically-blocked differential element and the harmonically-restrained differential element may be selectively combined into a single tripping signal output. An additional harmonic blocking element may supervise both differential elements and/or the combined tripping signal. The additional harmonic blocking element may provide odd-harmonic blocking, such as harmonic blocking based on a fifth harmonic of the raw operating current.

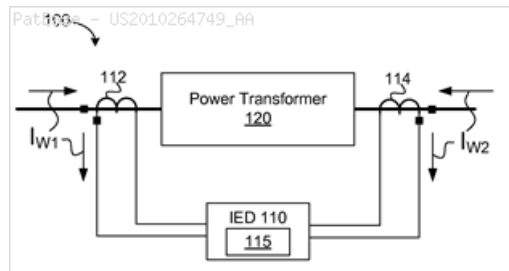
Classifications:

International (IPC 8-9): H02H3/00 H02J1/02 (Advanced/Invention);
H03H7/01 (Advanced/Non-invention)

CPC: H02J3/01 H02M1/12 Y02E40/40

European: H02J3/01 H02M1/12 Y02E40/40

US: 307/105 307/105P 333/177 333/177S 361/62 361/81



Family:

Publication number	Publication date	Application number	Application date
US2010264749 AA	20101021	US20090424705	20090416
US8194374 BB	20120605	US20090424705	20090416

Priority:

US20090424705 20090416

Probable Assignee: SCHWEITZER ENGINEERING LABORATORIES INC

Assignee(s): (std): FISCHER NORMANN ; GUZMAN CASILLAS ARMANDO ; SCHWEITZER ENGINEERING LAB INC ; SCHWEITZER ENGINEERING LAB INC

Assignee(s): CITIBANK NA ADMINISTRATIVE AGENT AS ; SCHWEITZER ENGINEERING LABORATORIES INC ; SCHWEITZER ENGINEERING LABORATORIES INC

Inventor(s): (std): GUZMAN CASILLAS ARMANDO ; FISCHER NORMANN

Agent(s): SCHWEITZER ENGINEERING LABORATORIES INC RICHARD EDGE; STOEL RIVES LLP

9) Family number: 50626930 (WO12022901A1)

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Title: PROTECTION SYSTEM FOR ELECTRIC TRANSFORMER

Abstract: Protection system for an electric transformer (1) connected to a network of a first voltage (11) and to a network of a second voltage (12), comprising a protection means (6) and a cutoff member (7) capable of disconnecting phases of the transformer (1) of the network of first voltage (11), characterized in that said protection means (6) is linked to said cutoff member (7) and to another cutoff member (13) able to disconnect phases of the transformer (1) from the network of second voltage (12).

Classifications:

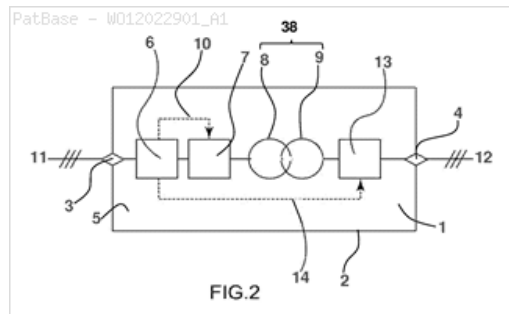
International (IPC 8-9): H01F27/34 H01F27/40 H01H33/55 H01H71/12

H02H7/04 (Advanced/Invention);

H01H33/55 H02H7/04 (Advanced/Non-invention)

CPC: H01F27/402 H01H33/555 H01H71/122 H02H7/04

European: H01H71/12C T01H33/55B T02H7/04



Family:

Publication number	Publication date	Application number	Application date
EP2599100 A1	20130605	EP20110757370	20110728
FR2963498 A1	20120203	FR20100056213	20100728
FR2963498 B1	20130705	FR20100056213	20100728
WO12022901 A1	20120223	WO2011FR51832	20110728

Priority:

FR20100056213 20100728

WO2011FR51832 20110728

Probable Assignee: TRANSFIX TOULON SOC NOUV

Assignee(s): (std): FALTERMEIER JEAN FRANCIS ; TRANSFIX TOULON SOC NOUV

Assignee(s): NOUVELLE TRANSFIX TOULON SOC ; SOCIETE NOUVELLE TRANSFIX TOULON

Inventor(s): (std): FALTERMEIER JEAN FRANCIS

Inventor(s): JEAN FRANCIS FALTERMEIER

Agent(s): NOVAGRAAF TECHNOLOGIES; BETHENOD MARC

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 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

10) Family number: 29430390 (ES2155037B)

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Title: CENTRO DE TRANSFORMACION INTEGRADO.

Abstract: Complete transformation centre composed of a single transportation unit in which the handling and protection function of the medium voltage transformer (3) is performed in an equipment piece equipped with an SF (sulphur hexafluoride) atmosphere, regardless of the cooling liquid of the transformer; the high voltage and medium voltage bushings are placed on the same vertical face (5) that is not equipped with cooling blades, placed conveniently for its direct connection to the respective elements of medium and high voltage.

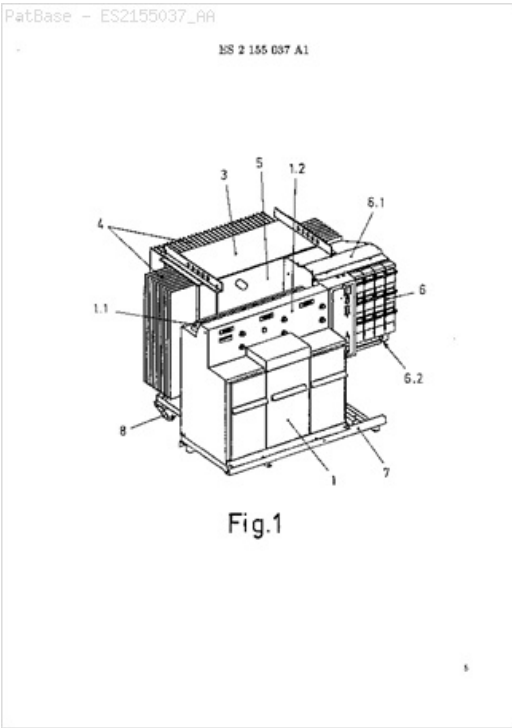
Classifications:

International (IPC 8-9): H02B7/01 (Advanced/Invention);

H02B7/00 (Core/Invention)

International (IPC 1-7): H02B7/01

CPC: H02B7/06



Family:

Publication number	Publication date	Application number	Application date
ES2155037 AA	20010416	ES19990001598	19990716
ES2155037 BA	20011201	ES19990001598	19990716

Priority:

ES19990001598 19990716

Probable Assignee: SCHNEIDER ELECTRIC ESPANA SA

Assignee(s): (std): SCHNEIDER ELECTRIC ESPANA S A ; SCHNEIDER ELECTRIC ESPANA SA

Inventor(s): (std): MUNOZ LOPEZ VILLALTA RAFAEL