

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
4 September 2003 (04.09.2003)

PCT

(10) International Publication Number
WO 03/073576 A3

(51) International Patent Classification⁷: **H02H 3/00**

(21) International Application Number: PCT/US03/05453

(22) International Filing Date: 25 February 2003 (25.02.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/359,544 25 February 2002 (25.02.2002) US
60/438,159 6 January 2003 (06.01.2003) US

(71) Applicant: **GENERAL ELECTRIC COMPANY**
[US/US]; 41 Woodford Avenue, Plainville, CT 06062 (US).

(72) Inventors: **PREMERLANI, William, James**; 133 Woodhave Drive, Scotia, NY 12302 (US). **BERKCAN, Ertugrul**; 4 Wintergreen Court, Clifton Park, NY 12065 (US).

(74) Agent: **GREELEY, Paul, D.**; Ohlandt, Greeley, Ruggiero & Perle, LLP, 10th floor, One Landmark Square, Stamford, CT 06901-2682 (US).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

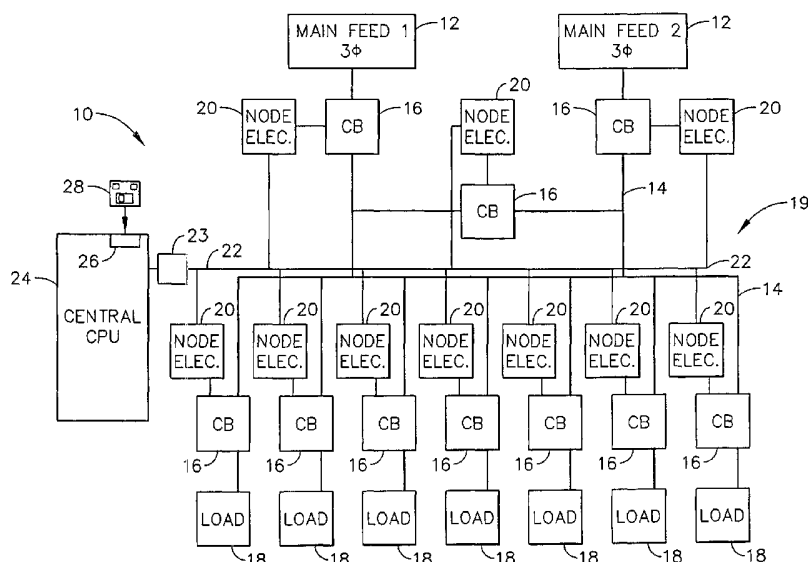
Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:
20 November 2003

[Continued on next page]

(54) Title: METHOD AND APPARATUS FOR GROUND FAULT PROTECTION



(57) Abstract: A method and apparatus for monitoring a centrally controlled power distribution system is provided. The method includes sampling an electrical current flow in the centrally controlled power distribution system (10), transmitting the sampled current signals to a central control processing unit (24), determining a ground fault presence and location based on the current signals received from all of the node electronics units (20), and isolating the determined ground fault by opening circuit breakers (16) supplying power to the fault. The apparatus is configured to sample an electrical current flow in the centrally controlled power distribution system (10), transmit the sampled current signals associated with each circuit breaker (16) to a central control processing unit (24), determine a ground fault presence and location based on the current signals received from all of the node electronics units (20) in the power distribution system (10), and isolate the determined ground fault by opening.



WO 03/073576 A3



For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/05453

A. CLASSIFICATION OF SUBJECT MATTER IPC(7) : H02H/3/00 US CL : 361/42 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) U.S. : 361/42,64,67,68,71 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)				
C. DOCUMENTS CONSIDERED TO BE RELEVANT				
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.		
X --, P Y	US 6,496,342 B1 (Horvath et al) 17 December 2002, col. 3 lines 53-67, col. 4, lines 1-13, and col. 8, lines 1-4 and col. 16, lines 7-23.	1-2, 4-14, and 16-17 ----- 3 and 15		
X	US 3,963,964 A (Mustaphi) 15 June 1976 col. 1, lines 40-64.	1,2, 4-14		
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.				
* Special categories of cited documents: <table border="0"> <tr> <td style="vertical-align: top;"> "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent 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 </td> <td style="vertical-align: top;"> "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 </td> </tr> </table>			"A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent 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
"A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent 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 01 May 2003 (01.05.2003)		Date of mailing of the international search report 17 SEP 2003		
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703)305-3230		Authorized officer Brian Circus <i>Brian Circus for</i> Telephone No. 703-308-0956		