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(54) **Title:** MULTI-LEVEL INVERTER APPARATUS AND METHODS USING VARIABLE OVERCURRENT RESPONSE

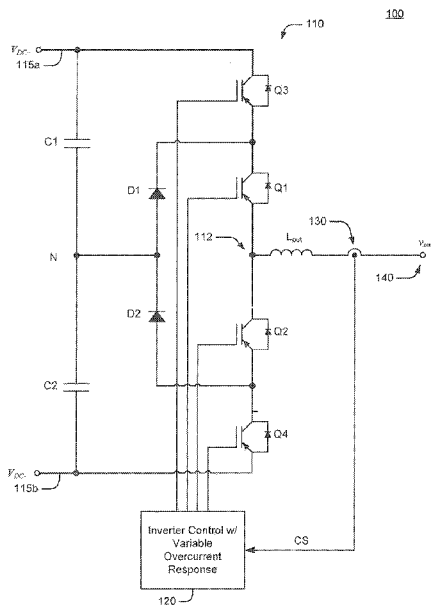


FIG. 1

(57) **Abstract:** An inverter includes a multilevel bridge circuit. A control circuit is operatively coupled to the multilevel bridge circuit and configured to detect an overcurrent for an output of the inverter, to generate a measure of a duration of the overcurrent and to selectively put an output of the bridge circuit in a first impedance state or a second impedance state based on the measure. The first and second impedance states may provide respective first and second impedances between the bridge circuit output and a neutral.



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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) H02M H02H		
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C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 1 533 888 AI (YASKAWA DENKI SEISAKUSHO KK [JP]) 25 May 2005 (2005-05-25) paragraphs [0002] , [0007] , [0009] , [0012] - [0016] , [0026] - [0031] , [0035] - [0037] ; figures 1,2 -----	1-8, 11, 20-22
Y	US 4 706 177 A (JOSEPHSON ELLIOT [US]) 10 November 1987 (1987-11 -10) abstract; figures 1,6 col umn 1, l ines 15-20, 40-48 col umn 2, l ines 11-16, 30-32 -----	1-8, 11, 20-22
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<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> 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 21 July 2014		Date of mailing of the international search report 30/09/2014
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 Hani sch , Thomas

INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date																																
EP 1533888	AI	25-05-2005	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">CN</td> <td style="width: 15%;">1659776</td> <td style="width: 15%;">A</td> <td style="width: 55%;">24- 08-2005</td> </tr> <tr> <td>EP</td> <td>1533888</td> <td>AI</td> <td>25- 05-2005</td> </tr> <tr> <td>JP</td> <td>3864307</td> <td>B2</td> <td>27-12 -2006</td> </tr> <tr> <td>JP</td> <td>2004023809</td> <td>A</td> <td>22-01 -2004</td> </tr> <tr> <td>KR</td> <td>20050008714</td> <td>A</td> <td>21-01 -2005</td> </tr> <tr> <td>TW</td> <td>1281310</td> <td>B</td> <td>11-05 -2007</td> </tr> <tr> <td>US</td> <td>2006056211</td> <td>AI</td> <td>16-03 -2006</td> </tr> <tr> <td>W0</td> <td>03107521</td> <td>AI</td> <td>24-12 -2003</td> </tr> </table>	CN	1659776	A	24- 08-2005	EP	1533888	AI	25- 05-2005	JP	3864307	B2	27-12 -2006	JP	2004023809	A	22-01 -2004	KR	20050008714	A	21-01 -2005	TW	1281310	B	11-05 -2007	US	2006056211	AI	16-03 -2006	W0	03107521	AI	24-12 -2003
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