

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
17 November 2005 (17.11.2005)

PCT

(10) International Publication Number
WO 2005/108003 A3

- (51) International Patent Classification⁷: **B23K 35/24**
- (21) International Application Number:
PCT/US2005/015837
- (22) International Filing Date: 4 May 2005 (04.05.2005)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
10/839,863 5 May 2004 (05.05.2004) US
- (71) Applicant (for all designated States except US): **ELECTRIC POWER RESEARCH INSTITUTE, INC.** [US/US]; 3412 Hillview Avenue, Palo Alto, CA 94304 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **COLEMAN, Kent, K.** [US/US]; 2802 Allendale Court, Concord, NC 28025 (US). **GANDY, David, W.** [US/US]; 3630 Glen Haven Drive, Concord, NC 28027 (US). **VISWANATHAN, Ramaswamy** [US/US]; 19461 Dehavilland, Saratoga, CA 95070 (US). **NEWELL, William, F., Jr.** [US/US]; 255 Rolling Hills Road, Mooresville, NC 28115 (US).
- (74) Agents: **OWENS, David, R.** et al.; Morgan Lewis & Bockius LLP, 2 Palo Alto Square., 3000 El Camino Real, Suite 700, Palo Alto, CA 94304 (US).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (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:
16 March 2006
- 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.



WO 2005/108003 A3

(54) Title: WELD FILLER FOR WELDING DISSIMILAR ALLOY STEELS AND METHOD OF USING SAME

(57) Abstract: Accordingly, the present invention provides a weld filler composition for joining different alloy steel pieces with substantially different chromium content, such as joining low alloy ferritic steel to high alloy ferritic steel, low alloy ferritic steel to austenitic stainless steel, or high alloy ferritic steel to austenitic stainless steel, and a method using the same. In one embodiment, the present invention provides a composition for a weld filler comprising nickel, iron, and chromium, which collectively comprise at least 50% by weight of the weld filler; niobium, carbon, manganese, molybdenum, and silicon, which collectively comprise no more than 50% by weight of the weld filler, and a niobium to carbon ratio of approximately 20 or less.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US05/15837

<p>A. CLASSIFICATION OF SUBJECT MATTER</p> <p>IPC(7) : B23K 035/24 US CL : 228/262, 410</p> <p>According to International Patent Classification (IPC) or to both national classification and IPC</p>																							
<p>B. FIELDS SEARCHED</p> <p>Minimum documentation searched (classification system followed by classification symbols) U.S. : 228/262, 410</p> <p>Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched</p> <p>Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) Please See Continuation Sheet</p>																							
<p>C. DOCUMENTS CONSIDERED TO BE RELEVANT</p> <table border="1"> <thead> <tr> <th>Category *</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>X</td> <td>US 5,425,912 A (SMITH et al.) 20 June 1995 (20.06.1995), see col. 1, line 49; col. 2, line 4.</td> <td>1-3, 5-12</td> </tr> <tr> <td>Y</td> <td></td> <td>13-17, 19-29</td> </tr> <tr> <td>X</td> <td>US 4,110,514 A (NICHOLSON) 29 August 1978 (29.08.1978), see col. 1, lines 20-27; col. 2 lines 5-40; col. 3, lines 45-54; col. 4, lines 3-28 and claim 13.</td> <td>1, 4, 6-10</td> </tr> <tr> <td>X, E</td> <td>US 2005/0095165 A1 (HARDESTY et al.) 05 MAY 2005 (05.05.2005), see paragraphs 25-26, Table 1 and claims 1, 3-8, 10-14.</td> <td>1, 4, 6-7, 9-10, 13-15, 18, 20-21, 23-24</td> </tr> <tr> <td>Y</td> <td>US 4,900,638 A (EMMERICH) 13 February 1990 (13.02.1990), see col. 1, line 57-col. 27, line 27; claims 1 & 3.</td> <td>13-17, 19-29</td> </tr> <tr> <td>A</td> <td>US 6,242,113 B1 (KISER) 05 June 2001 (05.06.2001).</td> <td>1-29</td> </tr> </tbody> </table>			Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	X	US 5,425,912 A (SMITH et al.) 20 June 1995 (20.06.1995), see col. 1, line 49; col. 2, line 4.	1-3, 5-12	Y		13-17, 19-29	X	US 4,110,514 A (NICHOLSON) 29 August 1978 (29.08.1978), see col. 1, lines 20-27; col. 2 lines 5-40; col. 3, lines 45-54; col. 4, lines 3-28 and claim 13.	1, 4, 6-10	X, E	US 2005/0095165 A1 (HARDESTY et al.) 05 MAY 2005 (05.05.2005), see paragraphs 25-26, Table 1 and claims 1, 3-8, 10-14.	1, 4, 6-7, 9-10, 13-15, 18, 20-21, 23-24	Y	US 4,900,638 A (EMMERICH) 13 February 1990 (13.02.1990), see col. 1, line 57-col. 27, line 27; claims 1 & 3.	13-17, 19-29	A	US 6,242,113 B1 (KISER) 05 June 2001 (05.06.2001).	1-29
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.																					
X	US 5,425,912 A (SMITH et al.) 20 June 1995 (20.06.1995), see col. 1, line 49; col. 2, line 4.	1-3, 5-12																					
Y		13-17, 19-29																					
X	US 4,110,514 A (NICHOLSON) 29 August 1978 (29.08.1978), see col. 1, lines 20-27; col. 2 lines 5-40; col. 3, lines 45-54; col. 4, lines 3-28 and claim 13.	1, 4, 6-10																					
X, E	US 2005/0095165 A1 (HARDESTY et al.) 05 MAY 2005 (05.05.2005), see paragraphs 25-26, Table 1 and claims 1, 3-8, 10-14.	1, 4, 6-7, 9-10, 13-15, 18, 20-21, 23-24																					
Y	US 4,900,638 A (EMMERICH) 13 February 1990 (13.02.1990), see col. 1, line 57-col. 27, line 27; claims 1 & 3.	13-17, 19-29																					
A	US 6,242,113 B1 (KISER) 05 June 2001 (05.06.2001).	1-29																					
<p><input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.</p>																							
<p>* Special categories of cited documents:</p> <table border="0"> <tr> <td>"A" document defining the general state of the art which is not considered to be of particular relevance</td> <td>"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</td> </tr> <tr> <td>"E" earlier application or patent published on or after the international filing date</td> <td>"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</td> </tr> <tr> <td>"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)</td> <td>"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</td> </tr> <tr> <td>"O" document referring to an oral disclosure, use, exhibition or other means</td> <td>"&" document member of the same patent family</td> </tr> <tr> <td>"P" document published prior to the international filing date but later than the priority date claimed</td> <td></td> </tr> </table>			"A" document defining the general state of the art which is not considered to be of particular relevance	"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	"E" earlier application or patent published on or after the international filing date	"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	"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)	"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	"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family	"P" document published prior to the international filing date but later than the priority date claimed												
"A" document defining the general state of the art which is not considered to be of particular relevance	"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																						
"E" earlier application or patent published on or after the international filing date	"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																						
"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)	"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																						
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family																						
"P" document published prior to the international filing date but later than the priority date claimed																							
<p>Date of the actual completion of the international search</p> <p>02 September 2005 (02.09.2005)</p>		<p>Date of mailing of the international search report</p> <p>04 JAN 2005</p>																					
<p>Name and mailing address of the ISA/US</p> <p>Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450</p> <p>Facsimile No. (571) 273-3201</p>		<p>Authorized officer</p> <p><i>Vincent Trans</i></p> <p>Vincent Trans</p> <p>Telephone No. (571)272-3613</p>																					

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US05/15837

Continuation of B. FIELDS SEARCHED Item 3:
EAST