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SUPPLEMENTARY EUROPEAN SEARCH REPORT

Application number:
EP 21 86 05 63

Classification of the application (IPC):

C22C 38/02, C22C 38/04, C22C 38/06, C22C 38/20, C22C 38/22, C22C 38/24,
C22C 38/26, C22C 38/28, C22C 38/32, C22C 38/42, C22C 38/44, C22C 38/46,
C22C 38/48, C22C 38/50, C22C 38/54, C21D 8/02, C22C 33/04

Technical fields searched (IPC):

C22C, C21D

DOCUMENTS CONSIDERED TO BE RELEVANT		
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim
X	KR 20120121811 A (HYUNDAI STEEL CO (HYSL)) 06 November 2012 (2012-11-06) * the whole document *	1-15
X	EP 3584337 A1 (JFE STEEL CORP [JP]) 25 December 2019 (2019-12-25) * claims 1-7 * * tables 1-3 * * paragraphs [0013] - [0093] *	1-15
A	US 2013061989 A1 (NAKAMURA NOBUYUKI [JP] ET AL) 14 March 2013 (2013-03-14) * claims 1-12 * * tables 1-3 * * paragraphs [0012] - [0081] *	1-15
A	US 2011232807 A1 (YOSHINAGA NAOKI [JP] ET AL) 29 September 2011 (2011-09-29) * claims 1, 2, 5 * * tables 1-9 * * paragraphs [0014] - [0248] *	1-15
A	EP 3112488 A1 (JFE STEEL CORP [JP]) 04 January 2017 (2017-01-04) * claims 1-4 * * paragraphs [0010] - [0080] * * tables 1-3 *	1-15
A	JP 2008156681 A (KOBE STEEL LTD) 10 July 2008 (2008-07-10) * the whole document *	1-15

The supplementary search report has been based on the last set of claims valid and available at the start of the search.

Place of search The Hague	Date of completion of the search 06 February 2024	Examiner Vlassi, Eleni
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CATEGORY OF CITED DOCUMENTS

X: particularly relevant if taken alone
Y: particularly relevant if combined with another document of the same category
A: technological background
O: non-written disclosure
& : member of the same patent family, corresponding document

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T: theory or principle underlying the invention
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DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim
A	US 2009092514 A1 (ASAHI HITOSHI [JP] ET AL) 09 April 2009 (2009-04-09) * claims 1-10 * * tables 1-2 * * paragraphs [0007] - [0114] *	1-15

The supplementary search report has been based on the last set of claims valid and available at the start of the search.

Place of search The Hague	Date of completion of the search 06 February 2024	Examiner Vlassi, Eleni
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X: particularly relevant if taken alone	P: intermediate document
Y: particularly relevant if combined with another document of the same category	T: theory or principle underlying the invention
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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
KR 20120121811	A	06-11-2012	NONE	
EP 3584337	A1	25-12-2019	CN 110312814 A EP 3584337 A1 JP 6394841 B1 JP WO2018150955 A1 KR 20190109459 A US 2020063227 A1 WO 2018150955 A1	08-10-2019 25-12-2019 26-09-2018 21-02-2019 25-09-2019 27-02-2020 23-08-2018
US 2013061989	A1	14-03-2013	BR 112012030709 A2 CN 102918173 A EP 2559783 A1 JP 4978741 B2 JP 2012012701 A KR 20120130019 A US 2013061989 A1 WO 2011152541 A1	01-11-2016 06-02-2013 20-02-2013 18-07-2012 19-01-2012 28-11-2012 14-03-2013 08-12-2011
US 2011232807	A1	29-09-2011	BR PI0414674 A CA 2540762 A1 CA 2747654 A1 CN 1860249 A CN 102011053 A EP 1681363 A1 EP 2309012 A1 ES 2391164 T3 KR 20060096002 A KR 20080035017 A KR 20110018463 A KR 20110028643 A MX 344641 B MX PA06003566 A TW I302572 B US 2007029015 A1 US 2011232807 A1 WO 2005031024 A1	28-11-2006 07-04-2005 07-04-2005 08-11-2006 13-04-2011 19-07-2006 13-04-2011 22-11-2012 05-09-2006 22-04-2008 23-02-2011 21-03-2011 04-01-2017 14-06-2006 01-11-2008 08-02-2007 29-09-2011 07-04-2005
EP 3112488	A1	04-01-2017	CN 106103770 A EP 3112488 A1 JP 5967311 B2 JP WO2015129199 A1 KR 20160126050 A US 2017009316 A1 WO 2015129199 A1	09-11-2016 04-01-2017 10-08-2016 30-03-2017 01-11-2016 12-01-2017 03-09-2015



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Patent document cited in search report		Publication date	Patent family member(s)		Publication date
JP 2008156681	A	10-07-2008	JP	4716332 B2	06-07-2011
			JP	2008156681 A	10-07-2008
US 2009092514	A1	09-04-2009	BR	PI0711795 A2	06-12-2011
			CN	101448967 A	03-06-2009
			EP	2039793 A1	25-03-2009
			JP	4969915 B2	04-07-2012
			JP	2007314828 A	06-12-2007
			KR	20080110663 A	18-12-2008
			US	2009092514 A1	09-04-2009
WO	2007136019 A1	29-11-2007			