Title (en)

METHOD FOR REFINING MOLTEN STEEL IN A VACUUM

Publication

EP 0325242 A3 19900214 (EN)

Application

EP 89100866 A 19890119

Priority

- JP 967588 A 19880121
- JP 3110589 A 19890213

Abstract (en)

[origin: EP0325242A2] A method for refining molten steel in a vacuum comprises an immersion process, wherein two immersion nozzles (5) (6) arranged at the lower portion of a vacuum vessel (4) are immersed in molten steel (2) in a ladle (1); a dissolving process, wherein gases are dissolved in molten steel by blowing gases containing at least gas soluble in the molten steel from a gas blow-in opening (3) arranged in a ladle (1) in the molten steel; a first degassing process, wherein the molten steel is degassed by keeping the the vacuum vessel evacuated, having the molten steel circulated between the ladle and the vacuum vessel by injecting gases containing at least an inert gas from the middle (7) of the rising tube (5) and blowing gases containing at least gas soluble in the molten steel from a gas blow-in opening (3) arranged in the ladle (1); and a second degassing process, wherein the molten steel is degassed by keeping the vacuum vessel evacuated, stopping a gas blow-in from the gas blow-in opening (3) arranged in the ladle (1) and having the molten steel circulated between the ladle and the vacuum vessel by injecting gases containing at least an inert gas from the middle (7) of the rising tube (5) in the molten steel (1).

IPC 1-7

C21C 7/10

IPC 8 full level

B22D 11/10 (2006.01); **B22D 11/11** (2006.01); **B22D 11/112** (2006.01); **B22D 11/113** (2006.01); **B22D 11/116** (2006.01); **B22D 11/117** (2006.01); **B22D 43/00** (2006.01); **C21C 7/10** (2006.01)

CPC (source: EP KR)

C21C 7/10 (2013.01 - EP KR)

Citation (search report)

- [Y] DE 1222090 B 19660804 - HERAEUS GMBH W C, et al
- [Y] US 3320053 A 19670516 - LEHMAN ALBERT L
- [A] GB 954214 A 19640402 - HERAEUS GMBH W C, et al
- [X] PATENT ABSTRACTS OF JAPAN, vol. 7, no. 43 (C-152)[1188], 19th February 1983; & JP-A-57 194 206 (KAWASAKI SEITETSU K.K.) 29-11-1982
- PATENT ABSTRACTS OF JAPAN, vol. 7, no. 53 (C-154)[1198], 03 March 1983#
- [Y] PATENT ABSTRACTS OF JAPAN, vol. 7, no. 53 (C-154)[1198], 3rd March 1983; & JP-A-57 200 514 (NIPPON KOKAN K.K.) 08-12-1982
- PATENT ABSTRACTS OF JAPAN, vol. 10, no.31 (C-327)[2088], 06 February 1986#
- [Y] PATENT ABSTRACTS OF JAPAN, vol. 10, no.31 (C-327)[2088], 6th February 1986; & JP-A-60 184 619 (SUMITOMO KINZOKU KOGYO K.K.) 20-09-1985
- [A] PATENT ABSTRACTS OF JAPAN, vol. 7, no. 118 (C-167)[1263], 21st May 1983; & JP-A-58 37 112 (KAWASAKI SEITETSU K.K.) 04-03-1983

Cited by

CN109922905A; EP1568790A1; GB2406580A; GB2406580B; US5077255A; US5183867A; GB2410503A; GB2410503B; EP0461415A1; CN113957203A; FR2809745A1; GB2381537A; GB2381537B; FR2812660A1; FR2812661A1; FR2812662A1; FR2812663A1; US7396378B2; WO0034533A3; WO0194648A3; WO2005080612A1

Designated contracting state (EPC)

DE FR GB IT

DOCDB simple family (publication)

EP 0325242 A2 19890726; **EP 0325242 A3 19900214**; AU 2848289 A 19890810; AU 601893 B2 19900920; BR 8900249 A 19890919; CA 1338397 C 19960618; JP H01188619 A 19890727; JP H02211974 A 19900823; KR 890012009 A 19890823; KR 930005067 B1 19930615

DOCDB simple family (application)

EP 89100866 A 19890119; AU 2848289 A 19890113; BR 8900249 A 19890119; CA 588802 A 19890120; JP 3110589 A 19890213; JP 967588 A 19880121; KR 890000602 A 19890120