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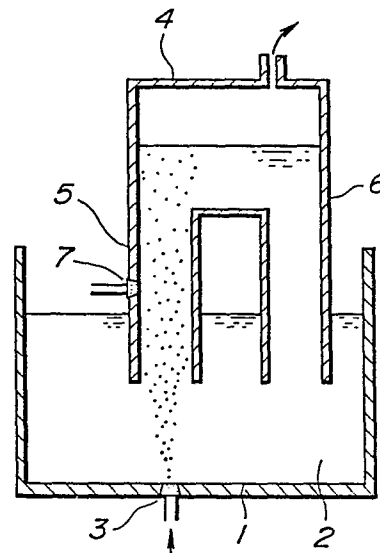
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54 **Method for refining molten steel in a vacuum.**

57 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 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).

FIG.1





DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
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 * Whole article *	1-22	C 21 C 7/10
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 * Whole article *	1-22	
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 * Whole article *	1-22	
Y	DE-B-1 222 090 (W.C. HERAEUS) * Figure; claims *	1	
Y	US-A-3 320 053 (LEHMANN) * Figures 1,2; column 2, line 43 - column 3, line 6 *	1	TECHNICAL FIELDS SEARCHED (Int. Cl.4)
A	GB-A- 954 214 (W.C. HERAEUS)		C 21 C C 22 B
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		
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 09-11-1989	Examiner OBERWALLENEY R.P.L.I.
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 P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			