



(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
27.10.2004 Bulletin 2004/44

(51) Int Cl.7: **B22D 1/00, B22D 41/00**

(43) Date of publication A2:
03.09.2003 Bulletin 2003/36

(21) Application number: **03003057.1**

(22) Date of filing: **12.02.2003**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IT LI LU MC NL PT SE SI SK TR
 Designated Extension States:
AL LT LV MK RO

- **Aramaki, Keizo**
Tajimi-shi, Gifu-ken 507-8607 (JP)
- **Kondo, Jyunya**
Tajimi-shi, Gifu-ken 507-8607 (JP)
- **Nakakita, Satoshi**
Tajimi-shi, Gifu-ken 507-8607 (JP)

(30) Priority: **19.02.2002 JP 2002041843**

(71) Applicant: **TOKYO YOGYO KABUSHIKI KAISHA**
Tajimi-shi, Gifu-ken 507-8607 (JP)

(74) Representative: **Sajda, Wolf E., Dipl.-Phys. et al**
MEISSNER, BOLTE & PARTNER
Postfach 86 06 24
81633 München (DE)

(72) Inventors:
 • **Egashira, Hiroaki**
Tajimi-shi, Gifu-ken 507-8607 (JP)

(54) **Ladle equipped with gas-blowing device having accumulator cylinder**

(57) A ladle (1) equipped with a gas blowing device having an accumulator cylinder (7) is provided, which has the capability of suppressing molten metal from penetrating into an injection plug (3) embedded in the ladle (1) and having a high resistance leading to a longer service life of the injection plug (3). The gas-blowing device (5) comprises a main pipe (8) for blowing gas into the ladle (1) via a gas-blowing plug (3) from a positionally independent gas supply source (4); an accumulator cylinder (7) for accumulating the gas supplied through the main pipe (8); and a controller (6). The controller (6) is used for accumulating the gas into the accumulator cylinder (7) when the gas blowing through the main pipe (8) begins or when the gas blowing is carried out, and for starting to blow the gas accumulated in the accumulator cylinder (7) simultaneously with a termination of the gas blowing through the main pipe (8).

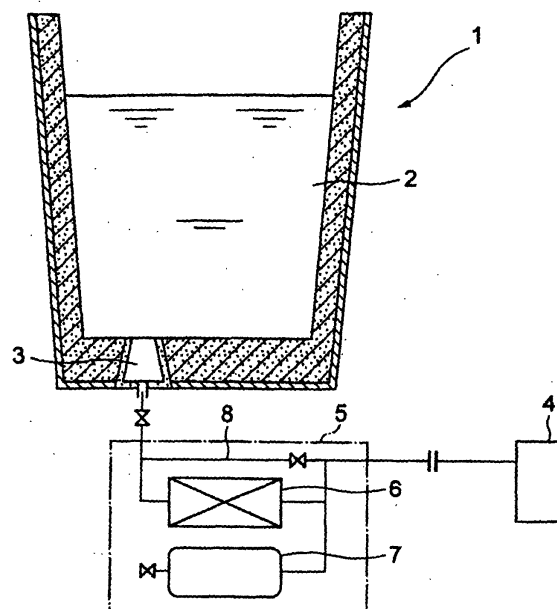


FIG. 1



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 03 00 3057

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (InCl.7)
X	EP 0 860 226 A (TOKYO YOGYO KK) 26 August 1998 (1998-08-26) * column 4, line 51 - column 9, line 31; figures 1-6 *	1-3	B22D1/00 B22D41/00
A	----- PATENT ABSTRACTS OF JAPAN vol. 0090, no. 91 (C-277), 19 April 1985 (1985-04-19) & JP 59 222509 A (NIPPON KOKAN KK), 14 December 1984 (1984-12-14) * abstract * -& JP 59 222509 A (NIPPON KOKAN KK) 14 December 1984 (1984-12-14) * figure 4 * -----	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			B22D
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		7 September 2004	Mailliard, A
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			

EPO FORM 1503 03.02 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 03 00 3057

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

07-09-2004

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
EP 0860226	A	26-08-1998	JP	10298630 A	10-11-1998
			CA	2230297 A1	25-08-1998
			DE	69704157 D1	05-04-2001
			DE	69704157 T2	20-09-2001
			EP	0860226 A1	26-08-1998
			US	5945063 A	31-08-1999

JP 59222509	A	14-12-1984	NONE		

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82