

Title (en)

Process for regulating the flow rate and bottom tap hole for metallurgical vessel

Title (de)

Verfahren zur Regelung des Durchflusses sowie Bodenausguss für ein metallurgisches Gefäß

Title (fr)

Procédé pour le réglage du débit ainsi qu'orifice de coulée pour récipient métallurgique

Publication

EP 1661645 B1 20081210 (DE)

Application

EP 05024382 A 20051109

Priority

DE 102004057381 A 20041126

Abstract (en)

[origin: EP1661645A2] A method for controlling flow through the bottom outlet of a metallurgical vessel with an upper nozzle (3) in the base (1), a lower nozzle (7) below (3), inert gas inlet(s) (13) and a sensor (10) on or in the lower nozzle (7) to measure the thickness of solid in the nozzle (clogging), in which the inert gas feed to the outlet is controlled by means of the signal from the sensor. Independent claims are also included for (1) a bottom outlet as described above (BO1) in which the inert gas inlet(s) and connection(s) are below the upper nozzle (3) and the sensor (10) is on or in the outside of the lower nozzle (7) and is also connected to an inert gas flow controller (2) a bottom outlet as above (BO2) in which the wall of the connecting opening between (3) and (7) is liquid-tight, at least with regard to molten metal, and the two nozzles (3, 7) are surrounded by a gas-tight housing (14) which forms a gas-tight seal with (7) at the bottom of the housing (14), with part of its inside on the outside of (7) and with a thermally-insulating solid between the wall of the connection (3:7) and the housing (14) .

IPC 8 full level

B22D 41/42 (2006.01); **B22D 11/10** (2006.01); **B22D 11/106** (2006.01); **B22D 41/24** (2006.01); **B22D 41/50** (2006.01); **B22D 41/58** (2006.01)

CPC (source: EP KR US)

B22D 41/24 (2013.01 - EP KR US); **B22D 41/42** (2013.01 - EP KR US); **B22D 41/502** (2013.01 - EP KR US); **B22D 41/58** (2013.01 - EP KR US)

Designated contracting state (EPC)

AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI SK TR

DOCDB simple family (publication)

EP 1661645 A2 20060531; **EP 1661645 A3 20061108**; **EP 1661645 B1 20081210**; AR 051232 A1 20061227; AT E416866 T1 20081215; AU 2005234658 A1 20060615; AU 2005234658 B2 20080117; BR PI0505332 A 20060711; CA 2523666 A1 20060526; CA 2523666 C 20100601; CN 1781626 A 20060607; CN 1781626 B 20140416; DE 102004057381 A1 20060601; DE 502005006195 D1 20090122; ES 2319309 T3 20090506; JP 2006150453 A 20060615; JP 4658785 B2 20110323; KR 101092125 B1 20111212; KR 20060059219 A 20060601; MX PA05012744 A 20060710; PL 1661645 T3 20090529; PT 1661645 E 20090317; RU 2005136813 A 20070527; RU 2009135250 A 20110327; RU 2381869 C2 20100220; RU 2433887 C2 20111120; UA 80339 C2 20070910; UA 85630 C2 20090210; US 2006113059 A1 20060601; US 2010147904 A1 20100617; US 8012405 B2 20110906; US 8273288 B2 20120925; ZA 200509511 B 20060830

DOCDB simple family (application)

EP 05024382 A 20051109; AR P050104416 A 20051021; AT 05024382 T 20051109; AU 2005234658 A 20051117; BR PI0505332 A 20051124; CA 2523666 A 20051017; CN 200510119385 A 20051102; DE 102004057381 A 20041126; DE 502005006195 T 20051109; ES 05024382 T 20051109; JP 2005342085 A 20051128; KR 20050113826 A 20051125; MX PA05012744 A 20051125; PL 05024382 T 20051109; PT 05024382 T 20051109; RU 2005136813 A 20051125; RU 2009135250 A 20090921; UA A200511084 A 20051122; UA A200706756 A 20051122; US 28650805 A 20051123; US 71251010 A 20100225; ZA 200509511 A 20051124