

Title (en)
Process and apparatus for adding calcium to a bath of molten ferrous material.

Title (de)
Verfahren und Vorrichtung zum Einbringen von Calcium in Eisenschmelzen.

Title (fr)
Procédé et appareil pour introduire du calcium dans un bain de fer fondu.

Publication
EP 0137618 A2 19850417 (EN)

Application
EP 84305326 A 19840806

Priority
• US 52275383 A 19830812
• US 52275483 A 19830812

Abstract (en)
A process for adding calcium to a bath (2) of molten ferrous material is disclosed in which a calcium metal-containing wire (1) is fed through a refractory lance (5) into the bath (2). Recirculatory stirring of the molten ferrous material is accomplished with an inert gas flow through the lance (5). The calcium-containing wire (1) is fed at such a rate that it substantially bends towards the horizontal direction after it leaves the lance (5) and melting of the calcium in the wire (1) occurs primarily in or directly below a region of downwelling of the molten ferrous material. Suitable wire feeding rates will depend upon the disposition of the lance (5) in the bath and the composition (e.g. clad or unclad) and cross-sectional dimensions of the calcium metal-containing wire (1). A preferred apparatus for adding processing elements in wire form directly into a molten material comprises a heat resistant nozzle (60) positionable relative to the surface of the molten material such that an inlet is disposed above the surface and an outlet (84) is disposed beneath the surface; a mechanism (24) for feeding the wire (20) through the nozzle (60) directly into the molten material; and a system (31, 33, 42) for injecting a substantially inert gaseous medium into the molten material together with the wire (20), whereby the inert gas substantially prevents closure of the nozzle (60) by solidified molten material and promotes mixture of the processing elements with the molten material through gas bubble agitation. The apparatus further comprises a substantially gas-tight conduit (44) connected to the nozzle inlet, through which the wire (20) and the inert gaseous medium are delivered to the nozzle (60). A pressure-driven seal (30) prevents atmospheric contamination and prevents loss of inert gas. Passing the wire (20) and gaseous medium through a bore in the nozzle (60) having an elongated, gradually tapered funnel-shaped section (80) adjacent the outlet (84) maximizes the effect of the inert gaseous medium.

IPC 1-7
C21C 7/00

IPC 8 full level
C21C 7/04 (2006.01); **B22D 1/00** (2006.01); **C21C 1/02** (2006.01); **C21C 1/10** (2006.01); **C21C 7/00** (2006.01); **C21C 7/06** (2006.01); **C21C 7/064** (2006.01); **C21C 7/068** (2006.01); **C22C 33/04** (2006.01)

CPC (source: EP KR)
C21C 1/02 (2013.01 - EP); **C21C 1/10** (2013.01 - EP); **C21C 7/0056** (2013.01 - EP); **C21C 7/04** (2013.01 - KR); **C21C 7/06** (2013.01 - EP); **C21C 7/064** (2013.01 - EP); **C21C 7/068** (2013.01 - EP); **C22C 33/04** (2013.01 - EP)

Cited by
EP0273576A1; EP2137326A4; FR2764905A1; US8221677B2; WO0142517A1; WO9859082A1; US7906747B2

Designated contracting state (EPC)
AT BE CH DE FR GB IT LI LU NL SE

DOCDB simple family (publication)
EP 0137618 A2 19850417; **EP 0137618 A3 19860402**; **EP 0137618 B1 19880622**; AU 3178384 A 19850214; AU 550957 B2 19860410; BR 8404033 A 19850716; DE 3472274 D1 19880728; DK 386284 A 19850213; DK 386284 D0 19840810; ES 535098 A0 19861016; ES 545812 A0 19860616; ES 545813 A0 19860616; ES 8607407 A1 19860616; ES 8607408 A1 19860616; ES 8700330 A1 19861016; JP H0347909 A 19910228; JP H0369966 B2 19911106; KR 850001921 A 19850410; KR 880000468 B1 19880407

DOCDB simple family (application)
EP 84305326 A 19840806; AU 3178384 A 19840810; BR 8404033 A 19840810; DE 3472274 T 19840806; DK 386284 A 19840810; ES 535098 A 19840810; ES 545812 A 19850801; ES 545813 A 19850801; JP 2934590 A 19900208; KR 840004837 A 19840811