Title (en)

COATING SYSTEM FOR HIGH TEMPERATURE STAINLESS STEEL

Title (de)

BESCHICHTUNGSSYSTEM FÜR HOCHTEMPERATUR ROSTFREIEN STAHL

Title (fr)

SYSTEME DE REVETEMENT POUR ACIER REFRACTAIRE INOXYDABLE

Publication

EP 1292721 A2 20030319 (EN)

Application

EP 01944809 A 20010608

Priority

- CA 0100848 W 20010608
- CA 2348145 A 20010522
- US 58919600 A 20000608
- US 69044700 A 20001018

Abstract (en)

[origin: WO0194664A2] A method for protecting carbon steel and stainless steel, and particularly high temperature stainless steel, from coking and corrosion at elevated temperatures in corrosive environments, such as during ethylene production by pyrolysis of hydrocarbons or the reduction of oxide ores, by coating the steel with a coating of MCrA1X or MCrA1XT in which M is nickel, cobalt, iron or a mixture thereof, X is yttrium, hafnium, zirconium, lanthanum, scandium or combination thereof, and T is silicon, tantalum, titanium, platinum, palladium, rhenium, molybdenum, tungsten, niobium, or combination thereof. The coating and substrate preferably are heat-treated at about 1000 to 1200 DEG C for at least about 10 minutes, preferably about 20 minutes to 24 hours, effective to metallurgically bond the overlay coating to the substrate and to form a multiphased microstructure. The coating preferably is aluminized by depositing a layer of aluminum thereon and subjecting the resulting coating to oxidation at a temperature above about 1000 DEG C for a time effective to form an alumina surface layer. An intermediary aluminum-containing interlayer may be deposited directly onto the substrate prior to deposition of the overlay coating and is heat-treated with the coating to form a protective interlayer between the stainless steel substrate and coating to disperse nitride formation at the substrate/coating interface. Also, the coating may be deposited onto and metallurgically bonded to the substrate by plasma transferred arc deposition of atomized powder of MCrA1XT, obviating the need for a separate heat treatment. Alternatively, a blended powder composition to produce a desired MCrA1XT alloy may be applied to the substrate.

IPC 1-7

C23C 26/00

IPC 8 full level

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CPC (source: EP KR)

C23C 26/00 (2013.01 - EP); **C23C 28/321** (2013.01 - EP); **C23C 28/3215** (2013.01 - EP); **C23C 28/345** (2013.01 - EP); **C23C 30/00** (2013.01 - KR)

Citation (search report)

See references of WO 0194664A2

Citation (examination)

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- US 3827967 A 19740806 - NAP C, et al
- EP 0134821 A1 19850327 - BBC BROWN BOVERI & CIE [CH]

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Designated contracting state (EPC)

DE FR GB NL

DOCDB simple family (publication)

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CA 0100848 W 20010608; AU 6720401 A 20010608; CN 01810768 A 20010608; EP 01944809 A 20010608; JP 2002502200 A 20010608; KR 20027016497 A 20021203