ECLA EUROPEAN CLASSIFICATION

C21B MANUFACTURE OF IRON OR STEEL (preliminary treatment of ferrous ores or scrap C22B1/00; electric heating H05B)

Note
This subclass covers the production of iron or steel from source materials, e.g. the production of pig-iron, and apparatus specially adapted therefor, e.g. blast furnaces, air heaters (furnaces in general F27).

C21B3/00 **General features in the manufacture of pig-iron** (mixers for pig-iron C21C1/06)

C21B3/02 . by applying additives, e.g. fluxing agents

C21B3/04 . Recovery of by-products, e.g. slag
C21B3/06 . . Treatment of liquid slag (slag wool C03B; slag stones C04B)
C21B3/08 . . . Cooling slag
C21B3/10 . . . Slag pots; Slag cars

C21B5/00 **Making pig-iron in the blast furnace**

C21B5/00B . [N: Injecting additional fuel or reducing agents]
C21B5/00B1 . . [N: Heated electrically (plasma)]
C21B5/00B2 . . [N: Injection of pulverulent coal]
C21B5/00B2A . . . [N: Injection of slurries]

C21B5/00D . [N: Automatically controlling the process]

C21B5/00E . [N: Conditions of the cokes or characterised by the cokes used]

C21B5/00F . [N: Composition or distribution of the charge]

C21B5/02 . Making special pig-iron, e.g. by applying additives, e.g. oxides of other metals
C21B5/02A . . [N: Injection of the additives into the melting part]
C21B5/02A1 . . . [N: of plastic material] [N0307]

C21B5/04 . Making slag of special composition

C21B5/06 . Using top gas in the blast furnace process (in coke ovens C10B)

C21B7/00 **Blast furnaces** (lifts associated with blast furnaces B66B9/06)

C21B7/00B . [N: Evacuating and treating of exhaust gases]
C21B7/00B1 . . [N: Bleeder valves or slides]

C21B7/00C . [N: Controlling or regulating of the top pressure]

C21B7/02 . Internal forms

C21B7/04 . with special refractories (refractory materials C04B)
C21B7/06 . . Linings for furnaces

C21B7/08 . Top armourings

C21B7/10 . Cooling; Devices therefor
C21B7/10A . . [N: Detection of leakages of the cooling liquid]
C21B7/10B . . [N: Cooling of the furnace bottom]

C21B7/12 . Opening or sealing the tap holes
C21B7/12A . . [N: Refractory plugging mass]

C21B7/14 . Discharging devices, e.g. for slag

C21B7/16 . Tuyéres
C21B7/16A . . [N: Blowpipe assembly]
C21B7/16B . . [N: Tuyere replacement apparatus]

C21B7/18 . Bell-and-hopper arrangements
C21B7/20 . . with appliances for distributing the burden

C21B7/22 . Dust arresters

C21B7/24 . Test rods or other checking devices

C21B9/00 Stoves for heating the blast in blast furnaces

C21B9/02 . Brick hot-blast stoves
C21B9/04 . . with combustion shaft
C21B9/06 . . Linings

C21B9/08 . Iron hot-blast stoves

C21B9/10 . Other details, e.g. blast mains
C21B9/12 . . Hot-blast valves or slides for blast furnaces (valves in general F16K)

C21B9/14 . Preheating the combustion air

C21B9/16 . Cooling or drying the hot-blast

C21B11/00 Making pig-iron other than in blast furnaces

C21B11/02 . in low shaft furnaces [N: or shaft furnaces]

C21B11/06 . in rotary kilns

C21B11/08 . in hearth-type furnaces

C21B11/10 . in electric furnaces

C21B13/00 Making spongy iron or liquid steel, by direct processes

C21B13/00A . [N: obtaining iron or steel in a molten state]
C21B13/00A2 . . [N: introduction of iron oxide into a bath of molten iron containing a carbon reductant]
C21B13/00A2B . . . [N: Reduction of iron ores by passing through a heated column of carbon]
C21B13/00A4 . . [N: introduction of iron oxide in the flame of a burner or a hot gas stream]

C21B13/00B . [N: In fluidised bed furnaces or apparatus containing a dispersion of the material]

C21B13/00D . [N: in a continuous way by reduction from ores]

C21B13/00E . [N: making metallised agglomerates or iron oxide]
C21B13/00E1 . . [N: On a massing grate]

C21B13/00F . [N: Starting from ores containing non ferrous metallic oxides]

C21B13/00G . [N: Preliminary conditioning of the solid carbonaceous reductant]

C21B13/00K . [N: Selection or treatment of the reducing gases]

C21B13/00P . [N: Use of special additives or fluxing agents]

C21B13/00S . [N: Conditioning, transformation of reduced iron ores]
C21B13/00S1 . . [N: Protecting against oxidation]

C21B13/02 . in shaft furnaces
C21B13/02A . . [N: wherein iron or steel is obtained in a molten state]
C21B13/02A2 . . . [N: heated electrically]

C21B13/04 . in retorts

C21B13/06 . in multi-storied furnaces

C21B13/08 . in rotary furnaces
C21B13/08A . . [N: wherein iron or steel is obtained in a molten state]

C21B13/10 . in hearth-type furnaces
C21B13/10A . . [N: Rotary hearth-type furnaces] [N0307]

C21B13/12 . in electric furnaces
C21B13/12D . . [N: By using plasma]

C21B13/14 . Multi-stage processes [N: processes carried out in different vessels or furnaces]

C21B13/14A . . [N: Injection of partially reduced ore into a molten bath]

C21B13/14C . . [N: Multi-step reduction without melting]

C21B15/00 **Other processes for the manufacture of iron from iron compounds** (general methods of reducing to metal C22B5/00; by electrolysis C25C1/06)

C21B15/00D . [N: By using nuclear energy]

C21B15/00F . [N: By a chloride process]

C21B15/02 . Metallothermic processes, e.g. thermit reduction

C21B15/04 . from iron carbonyl