

**CPC****COOPERATIVE PATENT CLASSIFICATION****C10B**

**DESTRUCTIVE DISTILLATION OF CARBONAGEOUS MATERIALS FOR PRODUCTION OF GAS, COKE, TAR, OR SIMILAR MATERIALS** ([cracking oils C10G](#); [underground gasification of minerals E21B 43/295](#))

**Retort and coke ovens****C10B 1/00****Retorts**

- C10B 1/02 . Stationary retorts
- C10B 1/04 . . Vertical retorts
- C10B 1/06 . . Horizontal retorts
- C10B 1/08 . . Inclined retorts
- C10B 1/10 . Rotary retorts

**C10B 3/00****Coke ovens with vertical chambers**

- C10B 3/02 . with heat-exchange devices

**C10B 5/00****Coke ovens with horizontal chambers**

- C10B 5/02 . with vertical heating flues
- C10B 5/04 . . with cross-over inter-connections
- C10B 5/06 . with horizontal heating flues
- C10B 5/08 . with horizontal and vertical heating flues
- C10B 5/10 . with heat-exchange devices
- C10B 5/12 . . with regenerators
- C10B 5/14 . . . . situated in the longitudinal direction of the chambers
- C10B 5/16 . . . . with separated flues
- C10B 5/18 . . . . situated in the longitudinal direction of the oven battery
- C10B 5/20 . . with recuperators

**C10B 7/00****Coke ovens with mechanical conveying means for the raw material inside the oven**

- C10B 7/02 . with rotary scraping devices
- C10B 7/04 . with shaking or vibrating devices
- C10B 7/06 . with endless conveying devices
- C10B 7/08 . . in vertical direction
- C10B 7/10 . with conveyer-screws
- C10B 7/12 . with tilting or rocking means
- C10B 7/14 . with trucks, containers, or trays

**C10B 9/00****Beehive ovens**

- C10B 11/00**            **Coke ovens with inclined chambers**
- C10B 13/00**            **Coke ovens with means for bringing and keeping the charge under mechanical pressure**
- C10B 15/00**            **Other coke ovens**
- C10B 15/02            . with floor heating

### **Heating of coke ovens**

- C10B 17/00**            **Preheating of coke ovens**
- C10B 19/00**            **Heating of coke ovens by electrical means**
- C10B 21/00**            **Heating of coke ovens with combustible gases**
- C10B 21/02            . with lean gas
- C10B 21/04            . with rich gas
- C10B 21/06            . in coke ovens suitable for the use of lean gas or rich gas
- C10B 21/08            . by applying special heating gases
- C10B 21/10            . Regulating and controlling the combustion
- C10B 21/12            .. Burners
- C10B 21/14            .. Devices for reversing the draught
- C10B 21/16            .. by controlling or varying the openings between the heating flues and the regenerator flues
- C10B 21/18            .. Recirculating the flue gases
- C10B 21/20            . Methods of heating ovens of the chamber oven type
- C10B 21/22            .. by introducing the heating gas and air at various levels
- C10B 21/24            ... at the top and the bottom of the vertical heating flues
- C10B 21/26            .. by introducing the heating gas and air at the top of the vertical flues only
- C10B 23/00**            **Other methods of heating coke ovens**
- C10B 25/00**            **Doors or closures for coke ovens**
- C10B 25/02            . Doors; Door frames
- C10B 25/04            .. for ovens with vertical chambers
- C10B 25/06            .. for ovens with horizontal chambers
- C10B 25/08            .. Closing and opening the doors
- C10B 25/10            ... for ovens with vertical chambers
- C10B 25/12            ... for ovens with horizontal chambers
- C10B 25/14            ... Devices for lifting doors
- C10B 25/16            .. Sealing; Means for sealing
- C10B 25/18            .. Cooling
- C10B 25/20            . Lids or closures for charging holes

- C10B 25/22 . . . for ovens with vertical chambers
- C10B 25/24 . . . for ovens with horizontal chambers

#### **C10B 27/00 Arrangements for withdrawal of the distillation gases**

- C10B 27/02 . with outlets arranged at different levels in the chamber
- C10B 27/04 . during the charging operation of the oven
- C10B 27/06 . Conduit details, e.g. valves

#### **C10B 29/00 Other details of coke ovens**

- C10B 29/02 . Brickwork, e.g. casings, linings, walls
- C10B 29/04 . Controlling or preventing expansion or contraction
- C10B 29/06 . Preventing or repairing leakages of the brickwork
- C10B 29/08 . Bracing or foundation of the ovens

### **Devices for charging and discharging coke ovens; Mechanical treatments of coal charges**

#### **C10B 31/00 Charging devices**

- C10B 31/02 . for charging vertically
- C10B 31/04 . . coke ovens with horizontal chambers
- C10B 31/06 . for charging horizontally
- C10B 31/08 . . coke ovens with horizontal chambers
- C10B 31/10 . . . with one compact charge
- C10B 31/12 . for liquid materials

#### **C10B 33/00 Discharging devices; Coke guides**

- C10B 33/003 . {Arrangements for pollution-free discharge}
- C10B 33/006 . {Decoking tools, e.g. hydraulic coke removing tools with boring or cutting nozzles}
- C10B 33/02 . Extracting coke with built-in devices, e.g. gears, screws
- C10B 33/04 . Pulling-out devices
- C10B 33/06 . . for horizontal chambers
- C10B 33/08 . Pushers, e.g. rams
- C10B 33/10 . . for horizontal chambers
- C10B 33/12 . Discharge valves
- C10B 33/14 . Coke guides

#### **C10B 35/00 Combined charging and discharging devices**

#### **C10B 37/00 Mechanical treatments of coal charges in the oven**

- C10B 37/02 . Levelling charges, e.g. with bars
- C10B 37/04 . Compressing charges ([during coking C10B 47/12](#))
- C10B 37/06 . Forming holes in charges

#### **C10B 39/00 Cooling or quenching coke**

- C10B 39/02 . Dry cooling outside the oven
- C10B 39/04 . Wet quenching
- C10B 39/06 . . . in the oven
- C10B 39/08 . . . Coke-quenching towers
- C10B 39/10 . combined with agitating means, e.g. rotating tables or drums
- C10B 39/12 . combined with conveying means
- C10B 39/14 . Cars
- C10B 39/16 . combined with sorting
- C10B 39/18 . Coke ramps

**C10B 41/00      Safety devices, e.g. signalling or controlling devices for use in the discharge of coke**

- C10B 41/005 . {for charging coal}
- C10B 41/02 . for discharging coke
- C10B 41/04 . . . by electrical means
- C10B 41/06 . . . by pneumatic or hydraulic means
- C10B 41/08 . for the withdrawal of the distillation gases

**C10B 43/00      Preventing or removing incrustations**

- C10B 43/02 . Removing incrustations
- C10B 43/04 . . . by mechanical means
- C10B 43/06 . . . . . from conduits, valves or the like
- C10B 43/08 . . . with liquids
- C10B 43/10 . . . by burning out
- C10B 43/12 . . . . . Burners
- C10B 43/14 . Preventing incrustations

**C10B 45/00      Other details**

- C10B 45/005 . {Devices for recovering spilled coke, e.g. recovering the coke falling out the oven when opening doors or withdrawing the leveler bar}
- C10B 45/02 . Devices for producing compact unified coal charges outside the oven (briquetting presses [B30B](#))

**Carbonising or coking processes**

**C10B 47/00      Destructive distillation of solid carbonaceous material with indirect heating, e.g. by external combustion**

- C10B 47/02 . with stationary charge
- C10B 47/04 . . . in shaft furnaces
- C10B 47/06 . . . in retorts
- C10B 47/08 . . . in beehive ovens
- C10B 47/10 . . . in coke ovens of the chamber type

- C10B 47/12 . . . in which the charge is subjected to mechanical pressures during coking
- C10B 47/14 . . . with the aid of hot liquids, e.g. molten salts
- C10B 47/16 . . . with indirect heating means both inside and outside the retorts
- C10B 47/18 . . . with moving charge
- C10B 47/20 . . . according to the moving bed type ([C10B 47/26 takes precedence](#))
- C10B 47/22 . . . in dispersed form ([C10B 47/26 takes precedence](#))
- C10B 47/24 . . . . . according to the "fluidised bed" technique
- C10B 47/26 . . . with the aid of hot liquids, e.g. molten salts
- C10B 47/28 . . . Other processes
- C10B 47/30 . . . in rotary ovens or retorts
- C10B 47/32 . . . in ovens with mechanical conveying means
- C10B 47/34 . . . . . with rotary scraping devices
- C10B 47/36 . . . . . in multi-stage ovens
- C10B 47/38 . . . . . with shaking or vibrating devices
- C10B 47/40 . . . . . with endless conveying devices
- C10B 47/42 . . . . . in vertical direction
- C10B 47/44 . . . . . with conveyer-screws
- C10B 47/46 . . . . . with trucks, containers, or trays
- C10B 47/48 . . . . . with tilting or rocking means

**C10B 49/00 Destructive distillation of solid carbonaceous materials by direct heating with heat-carrying agents including the partial combustion of the solid material to be treated**

- C10B 49/02 . . . with hot gases or vapours, e.g. hot gases obtained by partial combustion of the charge
- C10B 49/04 . . . while moving the solid material to be treated
- C10B 49/06 . . . . . according to the moving bed type
- C10B 49/08 . . . . . in dispersed form
- C10B 49/10 . . . . . according to the "fluidised bed" technique
- C10B 49/12 . . . . . by mixing tangentially, e.g. in vortex chambers
- C10B 49/14 . . . with hot liquids, e.g. molten metals
- C10B 49/16 . . . with moving solid heat-carriers in divided form
- C10B 49/18 . . . according to the "moving bed" type
- C10B 49/20 . . . in dispersed form
- C10B 49/22 . . . . . according to the "fluidised bed" technique

**C10B 51/00 Destructive distillation of solid carbonaceous materials by combined direct and indirect heating**

**C10B 53/00 Destructive distillation, specially adapted for particular solid raw materials or solid raw materials in special form ([wet carbonising of peat C10F](#))**

- C10B 53/02 . . . of cellulose-containing material ([production of pyroligneous acid C10C 5/00](#))
- C10B 53/04 . . . of powdered coal

- C10B 53/06 . of oil shale and/or or bituminous rocks
- C10B 53/07 . {of solid raw materials consisting} of synthetic polymeric materials, e.g. tyres {(waste in general, e.g. household waste [C10B 53/00](#))} (recovery or working-up of waste materials of organic macromolecular compounds or compositions based thereon by dry-heat treatment for obtaining partially depolymerised materials [C08J 11/10](#); production of liquid hydrocarbon mixtures from rubber or rubber waste [C10G 1/10](#))
- C10B 53/08 . in the form of briquettes, lumps and the like
- C10B 55/00 Coking mineral oils, bitumen, tar, and the like or mixtures thereof with solid carbonaceous material (cracking oils [C10G](#))**
- C10B 55/02 . with solid materials
- C10B 55/04 . . with moving solid materials
- C10B 55/06 . . . according to the "moving bed" type
- C10B 55/08 . . . in dispersed form
- C10B 55/10 . . . . according to the "fluidised bed" technique
- C10B 57/00 Other processes not covered before; Features of destructive distillation processes in general**
- C10B 57/005 . {After-treatment of coke, e.g. calcination desulfurization}
- C10B 57/02 . Multi-step carbonising or coking processes
- C10B 57/04 . Using charges of special composition
- C10B 57/045 . . {containing mineral oils, bitumen, tar or the like or mixtures thereof}
- C10B 57/06 . . containing additives
- C10B 57/08 . Non-mechanical pre-treatment of the charge ([C10L 9/00](#) takes precedence), {e.g. desulfurization}
- C10B 57/10 . . Drying
- C10B 57/12 . Applying additives during coking
- C10B 57/14 . Features of low-temperature carbonising processes
- C10B 57/16 . Features of high-temperature carbonising processes
- C10B 57/18 . Modifying the properties of the distillation gases in the oven (outside the oven [C10K](#))