

**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](#))**Guidance heading:** 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
- Guidance heading: 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

**Guidance heading:** **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](#) )

**Guidance heading: 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](#) )