

# CPC COOPERATIVE PATENT CLASSIFICATION

## C CHEMISTRY; METALLURGY

(NOTES omitted)

### CHEMISTRY

#### C10 PETROLEUM, GAS OR COKE INDUSTRIES; TECHNICAL GASES CONTAINING CARBON MONOXIDE; FUELS; LUBRICANTS; PEAT

#### 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

- 1/00 Retorts**
  - 1/02 . Stationary retorts
  - 1/04 . . Vertical retorts
  - 1/06 . . Horizontal retorts
  - 1/08 . . Inclined retorts
  - 1/10 . Rotary retorts
- 3/00 Coke ovens with vertical chambers**
  - 3/02 . with heat-exchange devices
- 5/00 Coke ovens with horizontal chambers**
  - 5/02 . with vertical heating flues
  - 5/04 . . with cross-over inter-connections
  - 5/06 . with horizontal heating flues
  - 5/08 . with horizontal and vertical heating flues
  - 5/10 . with heat-exchange devices
  - 5/12 . . with regenerators
  - 5/14 . . . situated in the longitudinal direction of the chambers
  - 5/16 . . . . with separated flues
  - 5/18 . . . situated in the longitudinal direction of the oven battery
  - 5/20 . . with recuperators
- 7/00 Coke ovens with mechanical conveying means for the raw material inside the oven**
  - 7/02 . with rotary scraping devices
  - 7/04 . with shaking or vibrating devices
  - 7/06 . with endless conveying devices
  - 7/08 . . in vertical direction
  - 7/10 . with conveyor-screws
  - 7/12 . with tilting or rocking means
  - 7/14 . with trucks, containers, or trays
- 9/00 Beehive ovens**
- 11/00 Coke ovens with inclined chambers**
- 13/00 Coke ovens with means for bringing and keeping the charge under mechanical pressure**
- 15/00 Other coke ovens**
  - 15/02 . with floor heating

##### Heating of coke ovens

- 17/00 Preheating of coke ovens**
- 19/00 Heating of coke ovens by electrical means**
- 21/00 Heating of coke ovens with combustible gases**
  - 21/02 . with lean gas
  - 21/04 . with rich gas
  - 21/06 . in coke ovens suitable for the use of lean gas or rich gas
  - 21/08 . by applying special heating gases
  - 21/10 . Regulating and controlling the combustion
  - 21/12 . . Burners
  - 21/14 . . Devices for reversing the draught
  - 21/16 . . by controlling or varying the openings between the heating flues and the regenerator flues
  - 21/18 . . Recirculating the flue gases
  - 21/20 . Methods of heating ovens of the chamber oven type
  - 21/22 . . by introducing the heating gas and air at various levels
  - 21/24 . . . at the top and the bottom of the vertical heating flues
  - 21/26 . . by introducing the heating gas and air at the top of the vertical flues only
- 23/00 Other methods of heating coke ovens**
- 25/00 Doors or closures for coke ovens**
  - 25/02 . Doors; Door frames
  - 25/04 . . for ovens with vertical chambers
  - 25/06 . . for ovens with horizontal chambers
  - 25/08 . . Closing and opening the doors
  - 25/10 . . . for ovens with vertical chambers
  - 25/12 . . . for ovens with horizontal chambers
  - 25/14 . . . Devices for lifting doors
  - 25/16 . . Sealing; Means for sealing
  - 25/18 . . Cooling
  - 25/20 . Lids or closures for charging holes
  - 25/22 . . for ovens with vertical chambers
  - 25/24 . . for ovens with horizontal chambers
- 27/00 Arrangements for withdrawal of the distillation gases**
  - 27/02 . with outlets arranged at different levels in the chamber
  - 27/04 . during the charging operation of the oven

- 27/06 . Conduit details, e.g. valves
- 29/00 Other details of coke ovens**
- 29/02 . Brickwork, e.g. casings, linings, walls
- 29/04 . Controlling or preventing expansion or contraction
- 29/06 . Preventing or repairing leakages of the brickwork
- 29/08 . Bracing or foundation of the ovens

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

- 31/00 Charging devices**
- 31/02 . for charging vertically
- 31/04 . . coke ovens with horizontal chambers
- 31/06 . for charging horizontally
- 31/08 . . coke ovens with horizontal chambers
- 31/10 . . . with one compact charge
- 31/12 . for liquid materials
- 33/00 Discharging devices; Coke guides**
- 33/003 . {Arrangements for pollution-free discharge}
- 33/006 . {Decoking tools, e.g. hydraulic coke removing tools with boring or cutting nozzles}
- 33/02 . Extracting coke with built-in devices, e.g. gears, screws
- 33/04 . Pulling-out devices
- 33/06 . . for horizontal chambers
- 33/08 . Pushers, e.g. rams
- 33/10 . . for horizontal chambers
- 33/12 . Discharge valves
- 33/14 . Coke guides
- 35/00 Combined charging and discharging devices**
- 37/00 Mechanical treatments of coal charges in the oven**
- 37/02 . Levelling charges, e.g. with bars
- 37/04 . Compressing charges (during coking [C10B 47/12](#))
- 37/06 . Forming holes in charges
- 39/00 Cooling or quenching coke**
- 39/02 . Dry cooling outside the oven
- 39/04 . Wet quenching
- 39/06 . . in the oven
- 39/08 . . Coke-quenching towers
- 39/10 . combined with agitating means, e.g. rotating tables or drums
- 39/12 . combined with conveying means
- 39/14 . Cars
- 39/16 . combined with sorting
- 39/18 . Coke ramps
- 41/00 Safety devices, e.g. signalling or controlling devices for use in the discharge of coke**
- 41/005 . {for charging coal}
- 41/02 . for discharging coke
- 41/04 . . by electrical means
- 41/06 . . by pneumatic or hydraulic means
- 41/08 . for the withdrawal of the distillation gases
- 43/00 Preventing or removing incrustations**
- 43/02 . Removing incrustations
- 43/04 . . by mechanical means
- 43/06 . . . from conduits, valves or the like
- 43/08 . . with liquids
- 43/10 . . by burning out
- 43/12 . . . Burners

- 43/14 . Preventing incrustations
- 45/00 Other details**
- 45/005 . {Devices for recovering spilled coke, e.g. recovering the coke falling out the oven when opening doors or withdrawing the leveler bar}
- 45/02 . Devices for producing compact unified coal charges outside the oven ([briquetting presses B30B](#))

#### **Carbonising or coking processes**

- 47/00 Destructive distillation of solid carbonaceous materials with indirect heating, e.g. by external combustion**
- 47/02 . with stationary charge
- 47/04 . . in shaft furnaces
- 47/06 . . in retorts
- 47/08 . . in beehive ovens
- 47/10 . . in coke ovens of the chamber type
- 47/12 . . in which the charge is subjected to mechanical pressures during coking
- 47/14 . . with the aid of hot liquids, e.g. molten salts
- 47/16 . . with indirect heating means both inside and outside the retorts
- 47/18 . with moving charge
- 47/20 . . according to the moving bed type ([C10B 47/26 takes precedence](#))
- 47/22 . . in dispersed form ([C10B 47/26 takes precedence](#))
- 47/24 . . . according to the "fluidised bed" technique
- 47/26 . . with the aid of hot liquids, e.g. molten salts
- 47/28 . Other processes
- 47/30 . . in rotary ovens or retorts
- 47/32 . . in ovens with mechanical conveying means
- 47/34 . . . with rotary scraping devices
- 47/36 . . . . in multi-stage ovens
- 47/38 . . . with shaking or vibrating devices
- 47/40 . . . with endless conveying devices
- 47/42 . . . . in vertical direction
- 47/44 . . . with conveyor-screws
- 47/46 . . . with trucks, containers, or trays
- 47/48 . . . with tilting or rocking means
- 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**
- 49/02 . with hot gases or vapours, e.g. hot gases obtained by partial combustion of the charge
- 49/04 . . while moving the solid material to be treated
- 49/06 . . . according to the moving bed type
- 49/08 . . . in dispersed form
- 49/10 . . . . according to the "fluidised bed" technique
- 49/12 . . . . by mixing tangentially, e.g. in vortex chambers
- 49/14 . with hot liquids, e.g. molten metals
- 49/16 . with moving solid heat-carriers in divided form
- 49/18 . . according to the "moving bed" type
- 49/20 . . in dispersed form
- 49/22 . . . according to the "fluidised bed" technique
- 51/00 Destructive distillation of solid carbonaceous materials by combined direct and indirect heating**

- 53/00 Destructive distillation, specially adapted for particular solid raw materials or solid raw materials in special form (wet carbonising of peat [C10F](#))**
- 53/02 . of cellulose-containing material (production of pyroligneous acid [C10C 5/00](#))
  - 53/04 . of powdered coal
  - 53/06 . of oil shale and/or or bituminous rocks
  - 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](#))
  - 53/08 . in the form of briquettes, lumps and the like
- 55/00 Coking mineral oils, bitumen, tar, and the like or mixtures thereof with solid carbonaceous material (cracking oils [C10G](#))**
- 55/02 . with solid materials
  - 55/04 . . with moving solid materials
  - 55/06 . . . according to the "moving bed" type
  - 55/08 . . . in dispersed form
  - 55/10 . . . according to the "fluidised bed" technique
- 57/00 Other processes not covered before; Features of destructive distillation processes in general**
- 57/005 . {After-treatment of coke, e.g. calcination desulfurization}
  - 57/02 . Multi-step carbonising or coking processes
  - 57/04 . using charges of special composition
  - 57/045 . . {containing mineral oils, bitumen, tar or the like or mixtures thereof}
  - 57/06 . . containing additives
  - 57/08 . Non-mechanical pretreatment of the charge ([C10L 9/00](#) takes precedence), {e.g. desulfurization}
  - 57/10 . . Drying
  - 57/12 . Applying additives during coking
  - 57/14 . Features of low-temperature carbonising processes
  - 57/16 . Features of high-temperature carbonising processes
  - 57/18 . Modifying the properties of the distillation gases in the oven (outside the oven [C10K](#))