

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

##### WARNING

In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

##### 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	43/00	<b>Preventing or removing incrustations</b>
<b>27/00</b>	<b>Arrangements for withdrawal of the distillation gases</b>	43/02	. Removing incrustations
27/02	. with outlets arranged at different levels in the chamber	43/04	. . by mechanical means
27/04	. during the charging operation of the oven	43/06	. . . from conduits, valves or the like
27/06	. Conduit details, e.g. valves	43/08	. . with liquids
<b>29/00</b>	<b>Other details of coke ovens</b>	43/10	. . by burning out
29/02	. Brickwork, e.g. casings, linings, walls	43/12	. . . Burners
29/04	. Controlling or preventing expansion or contraction	43/14	. Preventing incrustations
29/06	. Preventing or repairing leakages of the brickwork	<b>45/00</b>	<b>Other details</b>
29/08	. Bracing or foundation of the ovens	45/005	. {Devices for recovering spilled coke, e.g. recovering the coke falling out the oven when opening doors or withdrawing the leveler bar}
<b><u>Devices for charging and discharging coke ovens; Mechanical treatments of coal charges</u></b>		45/02	. Devices for producing compact unified coal charges outside the oven (briquetting presses B30B)
<b>31/00</b>	<b>Charging devices</b>	<b><u>Carbonising or coking processes</u></b>	
31/02	. for charging vertically	<b>47/00</b>	<b>Destructive distillation of solid carbonaceous materials with indirect heating, e.g. by external combustion</b>
31/04	. . coke ovens with horizontal chambers	47/02	. with stationary charge
31/06	. for charging horizontally	47/04	. . in shaft furnaces
31/08	. . coke ovens with horizontal chambers	47/06	. . in retorts
31/10	. . . with one compact charge	47/08	. . in beehive ovens
31/12	. for liquid materials	47/10	. . in coke ovens of the chamber type
<b>33/00</b>	<b>Discharging devices; Coke guides</b>	47/12	. . in which the charge is subjected to mechanical pressures during coking
33/003	. {Arrangements for pollution-free discharge}	47/14	. . with the aid of hot liquids, e.g. molten salts
33/006	. {Decoking tools, e.g. hydraulic coke removing tools with boring or cutting nozzles}	47/16	. . with indirect heating means both inside and outside the retorts
33/02	. Extracting coke with built-in devices, e.g. gears, screws	47/18	. with moving charge
33/04	. Pulling-out devices	47/20	. . according to the moving bed type (C10B 47/26 takes precedence)
33/06	. . for horizontal chambers	47/22	. . in dispersed form (C10B 47/26 takes precedence)
33/08	. Pushers, e.g. rams	47/24	. . . according to the "fluidised bed" technique
33/10	. . for horizontal chambers	47/26	. . with the aid of hot liquids, e.g. molten salts
33/12	. Discharge valves	47/28	. Other processes
33/14	. Coke guides	47/30	. . in rotary ovens or retorts
<b>35/00</b>	<b>Combined charging and discharging devices</b>	47/32	. . in ovens with mechanical conveying means
<b>37/00</b>	<b>Mechanical treatments of coal charges in the oven</b>	47/34	. . . with rotary scraping devices
37/02	. Levelling charges, e.g. with bars	47/36	. . . . in multi-stage ovens
37/04	. Compressing charges (during coking C10B 47/12)	47/38	. . . with shaking or vibrating devices
37/06	. Forming holes in charges	47/40	. . . with endless conveying devices
<b>39/00</b>	<b>Cooling or quenching coke</b>	47/42	. . . . in vertical direction
39/02	. Dry cooling outside the oven	47/44	. . . with conveyor-screws
39/04	. Wet quenching	47/46	. . . with trucks, containers, or trays
39/06	. . in the oven	47/48	. . . with tilting or rocking means
39/08	. . Coke-quenching towers	<b>49/00</b>	<b>Destructive distillation of solid carbonaceous materials by direct heating with heat-carrying agents including the partial combustion of the solid material to be treated</b>
39/10	. combined with agitating means, e.g. rotating tables or drums	49/02	. with hot gases or vapours, e.g. hot gases obtained by partial combustion of the charge
39/12	. combined with conveying means	49/04	. . while moving the solid material to be treated
39/14	. Cars	49/06	. . . according to the moving bed type
39/16	. combined with sorting	49/08	. . . in dispersed form
39/18	. Coke ramps	49/10	. . . . according to the "fluidised bed" technique
<b>41/00</b>	<b>Safety devices, e.g. signalling or controlling devices for use in the discharge of coke</b>	49/12	. . . . by mixing tangentially, e.g. in vortex chambers
41/005	. {for charging coal}	49/14	. with hot liquids, e.g. molten metals
41/02	. for discharging coke	49/16	. with moving solid heat-carriers in divided form
41/04	. . by electrical means	49/18	. . according to the "moving bed" type
41/06	. . by pneumatic or hydraulic means		
41/08	. for the withdrawal of the distillation gases		

- 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 carbonising or coking processes; 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](#))