

# 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

#### **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	47/16	• • with indirect heating means both inside and outside the retorts
33/04	• Pulling-out devices	47/18	• with moving charge
33/06	• • for horizontal chambers	47/20	• • according to the moving bed type ( <a href="#">C10B 47/26 takes precedence</a> )
33/08	• Pushers, e.g. rams		
33/10	• • for horizontal chambers	47/22	• • in dispersed form ( <a href="#">C10B 47/26 takes precedence</a> )
33/12	• Discharge valves	47/24	• • • according to the "fluidised bed" technique
33/14	• Coke guides	47/26	• • with the aid of hot liquids, e.g. molten salts
<b>35/00</b>	<b>Combined charging and discharging devices</b>	47/28	• Other processes
<b>37/00</b>	<b>Mechanical treatments of coal charges in the oven</b>	47/30	• • in rotary ovens or retorts
37/02	• Levelling charges, e.g. with bars	47/32	• • in ovens with mechanical conveying means
37/04	• Compressing charges ( <a href="#">during coking C10B 47/12</a> )	47/34	• • • with rotary scraping devices
37/06	• Forming holes in charges	47/36	• • • in multi-stage ovens
<b>39/00</b>	<b>Cooling or quenching coke</b>	47/38	• • • with shaking or vibrating devices
39/02	• Dry cooling outside the oven	47/40	• • • with endless conveying devices
39/04	• Wet quenching	47/42	• • • in vertical direction
39/06	• • in the oven	47/44	• • • with conveyor-screws
39/08	• • Coke-quenching towers	47/46	• • • with trucks, containers, or trays
39/10	• combined with agitating means, e.g. rotating tables or drums	47/48	• • • with tilting or rocking means
39/12	• combined with conveying means	<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>
39/14	• Cars	49/02	• with hot gases or vapours, e.g. hot gases obtained by partial combustion of the charge
39/16	• combined with sorting	49/04	• • while moving the solid material to be treated
39/18	• Coke ramps	49/06	• • • according to the moving bed type
<b>41/00</b>	<b>Safety devices, e.g. signalling or controlling devices for use in the discharge of coke</b>	49/08	• • • in dispersed form
41/005	• {for charging coal}	49/10	• • • • according to the "fluidised bed" technique
41/02	• for discharging coke	49/12	• • • • by mixing tangentially, e.g. in vortex chambers
41/04	• • by electrical means	49/14	• with hot liquids, e.g. molten metals
41/06	• • by pneumatic or hydraulic means	49/16	• with moving solid heat-carriers in divided form
41/08	• for the withdrawal of the distillation gases	49/18	• • according to the "moving bed" type
<b>43/00</b>	<b>Preventing or removing incrustations</b>	49/20	• • in dispersed form
43/02	• Removing incrustations	49/22	• • • according to the "fluidised bed" technique
43/04	• • by mechanical means	<b>51/00</b>	<b>Destructive distillation of solid carbonaceous materials by combined direct and indirect heating</b>
43/06	• • • from conduits, valves or the like	<b>53/00</b>	<b>Destructive distillation, specially adapted for particular solid raw materials or solid raw materials in special form (<a href="#">wet carbonising of peat C10F</a>)</b>
43/08	• • with liquids	53/02	• of cellulose-containing material ( <a href="#">production of pyrolic acid C10C 5/00</a> )
43/10	• • by burning out	53/04	• of powdered coal
43/12	• • • Burners	53/06	• of oil shale and/or bituminous rocks
43/14	• Preventing incrustations	53/07	• {of solid raw materials consisting} of synthetic polymeric materials, e.g. tyres ({ <a href="#">waste in general, e.g. household waste C10B 53/00;</a> } <a href="#">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;</a> <a href="#">production of liquid hydrocarbon mixtures from rubber or rubber waste C10G 1/10</a> )
<b>45/00</b>	<b>Other details</b>		• in the form of briquettes, lumps and the like
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>55/00</b>	<b>Coking mineral oils, bitumen, tar, and the like or mixtures thereof with solid carbonaceous material (<a href="#">cracking oils C10G</a>)</b>
45/02	• Devices for producing compact unified coal charges outside the oven ( <a href="#">briquetting presses B30B</a> )	55/02	• with solid materials
		55/04	• • with moving solid materials

**Carbonising or coking processes**

<b>47/00</b>	<b>Destructive distillation of solid carbonaceous material with indirect heating, e.g. by external combustion</b>
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

- 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 pre-treatment 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](#))