

## SECTION C — CHEMISTRY; METALLURGY

### 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) [5]

##### Subclass index

##### RETORTS; COKE OVENS

Retorts.....	1/00
Coke ovens.....	3/00-15/00
Structural features of coke ovens	
doors, closures; other features.....	25/00, 27/00, 29/00
heating.....	17/00-23/00
charging devices.....	13/00, 31/00-35/00
safety devices; preventing or removing incrustations.....	41/00, 43/00
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##### CARBONISING OR COKING PROCESSES

By destructive distillation.....	47/00-53/00
Coking mineral oils or the like.....	55/00
Other processes.....	57/00

##### FEATURES OF DESTRUCTIVE DISTILLATION PROCESSES IN GENERAL.....7/00, 13/00, 37/00, 39/00, 57/00

##### Retorts or coke ovens

<b>1/00</b>	<b>Retorts [1, 2006.01]</b>
1/02	• Stationary retorts [1, 2006.01]
1/04	• • Vertical retorts [1, 2006.01]
1/06	• • Horizontal retorts [1, 2006.01]
1/08	• • Inclined retorts [1, 2006.01]
1/10	• Rotary retorts [1, 2006.01]
<b>3/00</b>	<b>Coke ovens with vertical chambers [1, 2006.01]</b>
3/02	• with heat-exchange devices [1, 2006.01]
<b>5/00</b>	<b>Coke ovens with horizontal chambers [1, 2006.01]</b>
5/02	• with vertical heating flues [1, 2006.01]
5/04	• • with cross-over inter-connections [1, 2006.01]
5/06	• with horizontal heating flues [1, 2006.01]
5/08	• with horizontal and vertical heating flues [1, 2006.01]
5/10	• with heat-exchange devices [1, 2006.01]
5/12	• • with regenerators [1, 2006.01]
5/14	• • • situated in the longitudinal direction of the chambers [1, 2006.01]
5/16	• • • • with separated flues [1, 2006.01]
5/18	• • • situated in the longitudinal direction of the oven battery [1, 2006.01]
5/20	• • with recuperators [1, 2006.01]
<b>7/00</b>	<b>Coke ovens with mechanical conveying means for the raw material inside the oven [1, 2006.01]</b>
7/02	• with rotary scraping devices [1, 2006.01]
7/04	• with shaking or vibrating devices [1, 2006.01]
7/06	• with endless conveying devices [1, 2006.01]

7/08	• • in vertical direction [1, 2006.01]
7/10	• with conveyor-screws [1, 2006.01]
7/12	• with tilting or rocking means [1, 2006.01]
7/14	• with trucks, containers, or trays [1, 2006.01]

##### **9/00** **Beehive ovens [1, 2006.01]**

##### **11/00** **Coke ovens with inclined chambers [1, 2006.01]**

##### **13/00** **Coke ovens with means for bringing and keeping the charge under mechanical pressure [1, 2006.01]**

##### **15/00** **Other coke ovens [1, 2006.01]**

15/02	• with floor heating [1, 2006.01]
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##### Heating of coke ovens

##### **17/00** **Preheating of coke ovens [1, 2006.01]**

##### **19/00** **Heating of coke ovens by electrical means [1, 2006.01]**

##### **21/00** **Heating of coke ovens with combustible gases [1, 2006.01]**

21/02	• with lean gas [1, 2006.01]
21/04	• with rich gas [1, 2006.01]
21/06	• in coke ovens suitable for the use of lean gas or rich gas [1, 2006.01]
21/08	• by applying special heating gases [1, 2006.01]
21/10	• Regulating or controlling the combustion [1, 2006.01]

- 21/12 • • Burners [1, 2006.01]
- 21/14 • • Devices for reversing the draught [1, 2006.01]
- 21/16 • • by controlling or varying the openings between the heating flues and the regenerator flues [1, 2006.01]
- 21/18 • • Recirculating the flue gases [1, 2006.01]
- 21/20 • Methods of heating ovens of the chamber oven type [1, 2006.01]
- 21/22 • • by introducing the heating gas and air at various levels [1, 2006.01]
- 21/24 • • • at the top and the bottom of the vertical heating flues [1, 2006.01]
- 21/26 • • by introducing the heating gas and air at the top of the vertical flues only [1, 2006.01]
- 23/00 Other methods of heating coke ovens [1, 2006.01]**

- 25/00 Doors or closures for coke ovens [1, 2006.01]**
- 25/02 • Doors; Door frames [1, 2006.01]
- 25/04 • • for ovens with vertical chambers [1, 2006.01]
- 25/06 • • for ovens with horizontal chambers [1, 2006.01]
- 25/08 • • Closing or opening the doors [1, 2006.01]
- 25/10 • • • for ovens with vertical chambers [1, 2006.01]
- 25/12 • • • for ovens with horizontal chambers [1, 2006.01]
- 25/14 • • • Devices for lifting doors [1, 2006.01]
- 25/16 • • Sealing; Means for sealing [1, 2006.01]
- 25/18 • • Cooling [1, 2006.01]
- 25/20 • Lids or closures for charging holes [1, 2006.01]
- 25/22 • • for ovens with vertical chambers [1, 2006.01]
- 25/24 • • for ovens with horizontal chambers [1, 2006.01]
- 27/00 Arrangements for withdrawal of the distillation gases [1, 2006.01]**
- 27/02 • with outlets arranged at different levels in the chamber [1, 2006.01]
- 27/04 • during the charging operation of the oven [1, 2006.01]
- 27/06 • Conduit details, e.g. valves [1, 2006.01]
- 29/00 Other details of coke ovens [1, 2006.01]**
- 29/02 • Brickwork, e.g. casings, linings, walls [1, 2006.01]
- 29/04 • Controlling or preventing expansion or contraction [1, 2006.01]
- 29/06 • Preventing or repairing leakages of the brickwork [1, 2006.01]
- 29/08 • Bracing or foundation of the ovens [1, 2006.01]

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

- 31/00 Charging devices for coke ovens [1, 2006.01]**
- 31/02 • for charging vertically [1, 2006.01]
- 31/04 • • coke ovens with horizontal chambers [1, 2006.01]
- 31/06 • for charging horizontally [1, 2006.01]
- 31/08 • • coke ovens with horizontal chambers [1, 2006.01]
- 31/10 • • • with one compact charge [1, 2006.01]
- 31/12 • for liquid materials [1, 2006.01]
- 33/00 Discharging devices for coke ovens; Coke guides [1, 2006.01]**
- 33/02 • Extracting coke with built-in devices, e.g. gears, screws [1, 2006.01]
- 33/04 • Pulling-out devices [1, 2006.01]

- 33/06 • • for horizontal chambers [1, 2006.01]
- 33/08 • Pushers, e.g. rams [1, 2006.01]
- 33/10 • • for horizontal chambers [1, 2006.01]
- 33/12 • Discharge valves [1, 2006.01]
- 33/14 • Coke guides [1, 2006.01]
- 35/00 Combined charging and discharging devices for coke ovens [1, 2006.01]**
- 37/00 Mechanical treatments of coal charges in the oven [1, 2006.01]**
- 37/02 • Levelling charges, e.g. with bars [1, 2006.01]
- 37/04 • Compressing charges (during coking C10B 47/12) [1, 2006.01]
- 37/06 • Forming holes in charges [1, 2006.01]

- 39/00 Cooling or quenching coke [1, 2006.01]**
- 39/02 • Dry cooling outside the oven [1, 2006.01]
- 39/04 • Wet quenching [1, 2006.01]
- 39/06 • • in the oven [1, 2006.01]
- 39/08 • • Coke-quenching towers [1, 2006.01]
- 39/10 • combined with agitating means, e.g. rotating tables or drums [1, 2006.01]
- 39/12 • combined with conveying means [1, 2006.01]
- 39/14 • Cars [1, 2006.01]
- 39/16 • combined with sorting [1, 2006.01]
- 39/18 • Coke ramps [1, 2006.01]
- 41/00 Safety devices, e.g. signalling or controlling devices for use in the discharge of coke [1, 2006.01]**
- 41/02 • for discharging coke [1, 2006.01]
- 41/04 • • by electrical means [1, 2006.01]
- 41/06 • • by pneumatic or hydraulic means [1, 2006.01]
- 41/08 • for the withdrawal of the distillation gases [1, 2006.01]
- 43/00 Preventing or removing incrustations [1, 2006.01]**
- 43/02 • Removing incrustations [1, 2006.01]
- 43/04 • • by mechanical means [1, 2006.01]
- 43/06 • • • from conduits, valves or the like [1, 2006.01]
- 43/08 • • with liquids [1, 2006.01]
- 43/10 • • by burning out [1, 2006.01]
- 43/12 • • • Burners [1, 2006.01]
- 43/14 • Preventing incrustations [1, 2006.01]
- 45/00 Other details [1, 2006.01]**
- 45/02 • Devices for producing compact unified coal charges outside the oven [1, 2006.01]

#### Carbonising or coking processes

- 47/00 Destructive distillation of solid carbonaceous materials with indirect heating, e.g. by external combustion [1, 2006.01]**
- 47/02 • with stationary charge [1, 2006.01]
- 47/04 • • in shaft furnaces [1, 2006.01]
- 47/06 • • in retorts [1, 2006.01]
- 47/08 • • in beehive ovens [1, 2006.01]
- 47/10 • • in coke ovens of the chamber type [1, 2006.01]
- 47/12 • • in which the charge is subjected to mechanical pressure during coking [1, 2006.01]
- 47/14 • • with the aid of hot liquids, e.g. molten salts [1, 2006.01]

- 47/16 • • with indirect heating means both inside and outside the retorts [1, 2006.01]
- 47/18 • with moving charge [1, 2006.01]
- 47/20 • • according to the "moving bed" technique (C10B 47/26 takes precedence) [1, 2006.01]
- 47/22 • • in dispersed form (C10B 47/26 takes precedence) [1, 2006.01]
- 47/24 • • • according to the "fluidised bed" technique [1, 2006.01]
- 47/26 • • with the aid of hot liquids, e.g. molten salts [1, 2006.01]
- 47/28 • Other processes [1, 2006.01]
- 47/30 • • in rotary ovens or retorts [1, 2006.01]
- 47/32 • • in ovens with mechanical conveying means [1, 2006.01]
- 47/34 • • • with rotary scraping devices [1, 2006.01]
- 47/36 • • • • in multi-stage ovens [1, 2006.01]
- 47/38 • • • with shaking or vibrating devices [1, 2006.01]
- 47/40 • • • with endless conveying devices [1, 2006.01]
- 47/42 • • • • in vertical direction [1, 2006.01]
- 47/44 • • • with conveyor-screws [1, 2006.01]
- 47/46 • • • with trucks, containers, or trays [1, 2006.01]
- 47/48 • • • with tilting or rocking means [1, 2006.01]
- 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 [1, 2006.01]**
- 49/02 • with hot gases or vapours, e.g. hot gases obtained by partial combustion of the charge [1, 2006.01]
- 49/04 • • while moving the solid material to be treated [1, 2006.01]
- 49/06 • • • according to the "moving bed" technique [1, 2006.01]
- 49/08 • • • in dispersed form [1, 2006.01]
- 49/10 • • • • according to the "fluidised bed" technique [1, 2006.01]
- 49/12 • • • • by mixing tangentially, e.g. in vortex chambers [1, 2006.01]
- 49/14 • with hot liquids, e.g. molten metals [1, 2006.01]
- 49/16 • with moving solid heat-carriers in divided form [1, 2006.01]
- 49/18 • • according to the "moving bed" technique [1, 2006.01]
- 49/20 • • in dispersed form [1, 2006.01]
- 49/22 • • • according to the "fluidised bed" technique [1, 2006.01]
- 51/00 Destructive distillation of solid carbonaceous materials by combined direct and indirect heating [1, 2006.01]**
- 53/00 Destructive distillation, specially adapted for particular solid raw materials or solid raw materials in special form (wet carbonising of peat C10F) [1, 2006.01]**
- 53/02 • of cellulose-containing material (production of pyroligneous acid C10C 5/00) [1, 2006.01]
- 53/04 • of powdered coal [1, 2006.01]
- 53/06 • of oil shale or bituminous rocks [1, 2006.01]
- 53/07 • of synthetic polymeric materials, e.g. tyres (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) [2006.01]
- 53/08 • in the form of briquettes, lumps or the like [1, 2006.01]
- 55/00 Coking mineral oils, bitumen, tar or the like, or mixtures thereof, with solid carbonaceous materials (cracking oils C10G) [1, 2006.01]**
- 55/02 • with solid materials [1, 2006.01]
- 55/04 • • with moving solid materials [1, 2006.01]
- 55/06 • • • according to the "moving bed" technique [1, 2006.01]
- 55/08 • • • in dispersed form [1, 2006.01]
- 55/10 • • • • according to the "fluidised bed" technique [1, 2006.01]
- 57/00 Other carbonising or coking processes; Features of destructive distillation processes in general [1, 2006.01]**
- 57/02 • Multi-step carbonising or coking processes [1, 2006.01]
- 57/04 • using charges of special composition [1, 2006.01]
- 57/06 • • containing additives [1, 2006.01]
- 57/08 • Non-mechanical pretreatment of the charge [1, 2006.01]
- 57/10 • • Drying [1, 2006.01]
- 57/12 • Applying additives during coking [1, 2006.01]
- 57/14 • Features of low-temperature carbonising processes [1, 2006.01]
- 57/16 • Features of high-temperature carbonising processes [1, 2006.01]
- 57/18 • Modifying the properties of the distillation gases in the oven [1, 2006.01]