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]

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CARBONISING OR COKING PROCESSES
- By destructive distillation....47/00-53/00
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FEATURES OF DESTRUCTIVE DISTILLATION PROCESSES IN GENERAL....7/00, 13/00, 37/00, 39/00, 57/00

Retorts or coke ovens

1/00 Retorts [1, 2006.01]
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]**

3/00 Coke ovens with vertical chambers [1, 2006.01]
3/02 • with heat-exchange devices **[1, 2006.01]**

5/00 Coke ovens with horizontal chambers [1, 2006.01]
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]**

7/00 Coke ovens with mechanical conveying means for the raw material inside the oven [1, 2006.01]
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]**

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]**

<u>Devices for charging or discharging coke ovens; Mechanical treatments of coal charges</u>

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]**

<u>Carbonising or coking processes</u>

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]**