

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
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doors, closures; other features.....	25/00, 27/00, 29/00
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charging devices.....	13/00, 31/00-35/00
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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

1/00 Retorts	7/08	• • in vertical direction
1/02 • Stationary retorts	7/10	• with conveyer-screws
1/04 • • Vertical retorts	7/12	• with tilting or rocking means
1/06 • • Horizontal retorts	7/14	• with trucks, containers, or trays
1/08 • • Inclined retorts		
1/10 • Rotary retorts	9/00 Beehive ovens	
	11/00 Coke ovens with inclined chambers	
3/00 Coke ovens with vertical chambers	13/00 Coke ovens with means for bringing and keeping the charge under mechanical pressure	
3/02 • with heat-exchange devices	15/00 Other coke ovens	
	15/02 • with floor heating	
5/00 Coke ovens with horizontal chambers	Heating of coke ovens	
5/02 • with vertical heating flues	17/00 Preheating of coke ovens	
5/04 • • with cross-over inter-connections	19/00 Heating of coke ovens by electrical means	
5/06 • with horizontal heating flues	21/00 Heating of coke ovens with combustible gases	
5/08 • with horizontal and vertical heating flues	21/02 • with lean gas	
5/10 • with heat-exchange devices	21/04 • with rich gas	
5/12 • • with regenerators	21/06 • in coke ovens suitable for the use of lean gas or rich gas	
5/14 • • • situated in the longitudinal direction of the chambers	21/08 • by applying special heating gases	
5/16 • • • • with separated flues	21/10 • Regulating or controlling the combustion	
5/18 • • • situated in the longitudinal direction of the oven battery	21/12 • • Burners	
5/20 • • with recuperators	21/14 • • Devices for reversing the draught	
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		

C10B

- 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 or 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 or discharging coke ovens; Mechanical treatments of coal charges

31/00 Charging devices for coke ovens

- 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 for coke ovens; Coke guides

- 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 for coke ovens

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
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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

- 41/02 • 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

- 45/02 • Devices for producing compact unified coal charges outside the oven

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 pressure 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" technique (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 conveyer-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" technique
- 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" technique
- 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 or bituminous rocks
- 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

- 55/00 Coking mineral oils, bitumen, tar or the like, or mixtures thereof, with solid carbonaceous materials (cracking oils C10G)**
- 55/02 • with solid materials
- 55/04 • • with moving solid materials
- 55/06 • • • according to the "moving bed" technique
- 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**
- 57/02 • Multi-step carbonising or coking processes
- 57/04 • using charges of special composition
- 57/06 • • containing additives
- 57/08 • Non-mechanical pretreatment of the charge
- 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