

CPC COOPERATIVE PATENT CLASSIFICATION

C CHEMISTRY; METALLURGY (NOTES omitted)

CHEMISTRY

C10 PETROLEUM, GAS OR COKE INDUSTRIES; TECHNICAL GASES CONTAINING CARBON MONOXIDE; FUELS; LUBRICANTS; PEAT

C10J PRODUCTION OF PRODUCER GAS, WATER-GAS, SYNTHESIS GAS FROM SOLID CARBONACEOUS MATERIAL, OR MIXTURES CONTAINING THESE GASES ([synthesis gas from liquid or gaseous hydrocarbons C01B](#); [underground gasification of minerals E21B 43/295](#)); CARBURETTING AIR OR OTHER GASES

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.

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| 1/00 | Production of fuel gases by carburetting air or other gases without pyrolysis (for internal-combustion engines F02) | 3/16 | . . . simultaneously reacting oxygen and water with the carbonaceous material |
| 1/02 | . Carburetting air | 3/18 | . . . using electricity |
| 1/04 | . . Controlling supply of air | 3/20 | . . Apparatus; Plants |
| 1/06 | . . with materials which are liquid at ordinary temperatures | 3/22 | . . . Arrangements or dispositions of valves or flues |
| 1/08 | . . . by passage of air through or over the surface of the liquid | 3/24 | to permit flow of gases or vapours other than upwardly through the fuel bed |
| 1/10 | with the liquid absorbed on carriers | 3/26 | downwardly |
| 1/12 | . . . by atomisation of the liquid | 3/28 | fully automatic |
| 1/14 | . . . Controlling the supply of liquid in accordance with the air supply | 3/30 | . . . Fuel charging devices |
| 1/16 | . . with solid hydrocarbons | 3/32 | . . . Devices for distributing fuel evenly over the bed or for stirring up the fuel bed |
| 1/18 | . . in rotary carburettors | 3/34 | . . . Grates; Mechanical ash-removing devices |
| 1/20 | . Carburetting gases other than air | 3/36 | Fixed grates |
| 1/207 | . Carburetting by pyrolysis of solid carbonaceous material in a fuel bed (C10J 3/66 takes precedence) | 3/38 | with stirring beams |
| 1/213 | . Carburetting by pyrolysis of solid carbonaceous material in a carburettor | 3/40 | Movable grates |
| 1/22 | . Adding materials to prevent vapour deposition | 3/42 | Rotary grates |
| 1/24 | . Controlling humidity of the air or gas to be carburetted | 3/44 | . . . adapted for use on vehicles |
| 1/26 | . using raised temperatures or pressures | 3/46 | . Gasification of granular or pulverulent flues in suspension |
| 1/28 | . Odorising air gas | 3/463 | . . { in stationary fluidised beds } |
| 3/00 | Production of combustible gases containing carbon monoxide from solid carbonaceous fuels (destructive distillation processes C10B) | 3/466 | . . { Entrained flow processes } |
| 3/002 | . { Horizontal gasifiers, e.g. belt-type gasifiers } | 3/48 | . . Apparatus; Plants |
| 3/005 | . { Rotary drum or kiln gasifiers } | 3/482 | . . . { Gasifiers with stationary fluidised bed } |
| 3/007 | . { Screw type gasifiers } | 3/485 | . . . { Entrained flow gasifiers } |
| 3/02 | . Fixed-bed gasification of lump fuel | 3/487 | { Swirling or cyclonic gasifiers } |
| 3/04 | . . Cyclic processes, e.g. alternate blast and run | 3/50 | . . . Fuel charging devices |
| 3/06 | . . Continuous processes | 3/503 | { for gasifiers with stationary fluidised bed } |
| 3/08 | . . . with ash-removal in liquid state | 3/506 | { for entrained flow gasifiers } |
| 3/10 | . . . using external heating | 3/52 | . . . Ash-removing devices |
| 3/12 | . . . using solid heat-carriers | 3/523 | { for gasifiers with stationary fluidised bed } |
| 3/14 | . . . using gaseous heat-carriers | 3/526 | { for entrained flow gasifiers } |
| | | 3/54 | . . Gasification of granular or pulverulent fuels by the Winkler technique, i.e. by fluidisation |
| | | 3/56 | . . . Apparatus; Plants |
| | | 3/57 | . Gasification using molten salts or metals (C10J 3/02 , C10J 3/46 take precedence) |
| | | 3/58 | . combined with pre-distillation of the fuel |
| | | 3/60 | . . Processes |

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| 3/62 | . . . with separate withdrawal of the distillation products | 2300/094 | . . . Char |
| 3/64 | . . . with decomposition of the distillation products | 2300/0943 | . . . Coke |
| 3/66 | by introducing them into the gasification zone | 2300/0946 | . . . Waste, e.g. MSW, tires, glass, tar sand, peat, paper, lignite, oil shale |
| 3/72 | . Other features | 2300/095 | . . . Exhaust gas from an external process for purification |
| 3/721 | . . {Multistage gasification, e.g. plural parallel or serial gasification stages} | 2300/0953 | . . Gasifying agents |
| 3/723 | . . {Controlling or regulating the gasification process} | 2300/0956 | . . . Air or oxygen enriched air |
| 3/725 | . . {Redox processes} | 2300/0959 | . . . Oxygen |
| 3/726 | . . {Start-up} | 2300/0963 | . . . Ozone |
| 3/728 | . . {Shut down} | 2300/0966 | . . . Hydrogen |
| 3/74 | . . Construction of shells or jackets | 2300/0969 | . . . Carbon dioxide |
| 3/76 | . . . Water jackets; Steam boiler-jackets | 2300/0973 | . . . Water |
| 3/78 | . . High-pressure apparatus | 2300/0976 | as steam |
| 3/80 | . . with arrangements for preheating the blast or the water vapour | 2300/0979 | as supercritical steam |
| 3/82 | . . Gas withdrawal means | 2300/0983 | . . Additives |
| 3/84 | . . . with means for removing dust or tar from the gas | 2300/0986 | . . . Catalysts |
| 3/845 | {Quench rings} | 2300/0989 | . . . Hydrocarbons as additives to gasifying agents to improve caloric properties |
| 3/86 | . . combined with waste-heat boilers | 2300/0993 | . . . Inert particles, e.g. as heat exchange medium in a fluidized or moving bed, heat carriers, sand |
| 2200/00 | Details of gasification apparatus | 2300/0996 | . . . Calcium-containing inorganic materials, e.g. lime |
| 2200/06 | . Catalysts as integral part of gasifiers (catalysts added to the feed C10J 2300/0986) | 2300/12 | . Heating the gasifier |
| 2200/09 | . Mechanical details of gasifiers not otherwise provided for, e.g. sealing means | 2300/1207 | . . using pyrolysis gas as fuel |
| 2200/12 | . Electrodes present in the gasifier | 2300/1215 | . . using synthesis gas as fuel |
| 2200/15 | . Details of feeding means | 2300/1223 | . . by burners |
| 2200/152 | . . Nozzles or lances for introducing gas, liquids or suspensions | 2300/123 | . . by electromagnetic waves, e.g. microwaves |
| 2200/154 | . . Pushing devices, e.g. pistons | 2300/1238 | . . . by plasma |
| 2200/156 | . . Sluices, e.g. mechanical sluices for preventing escape of gas through the feed inlet | 2300/1246 | . . by external or indirect heating |
| 2200/158 | . . Screws | 2300/1253 | . . by injecting hot gas |
| 2200/31 | . Mobile gasifiers, e.g. for use in cars, ships or containers | 2300/1261 | . . by pulse burners |
| 2200/33 | . Laboratory scale gasifiers | 2300/1269 | . . by radiating device, e.g. radiant tubes |
| 2200/36 | . Moving parts inside the gasification reactor not otherwise provided for (devices for distributing fuel evenly over a fixed bed C10J 3/32) | 2300/1276 | . . . by electricity, e.g. resistor heating |
| 2200/39 | . Gasifiers designed as centrifuge | 2300/1284 | . . by renewable energy, e.g. solar energy, photovoltaic cells, wind |
| 2300/00 | Details of gasification processes | 2300/1292 | . . . mSolar energy |
| 2300/06 | . Modeling or simulation of processes | 2300/16 | . Integration of gasification processes with another plant or parts within the plant |
| 2300/09 | . Details of the feed, e.g. feeding of spent catalyst, inert gas or halogens | 2300/1603 | . . with gas treatment (gas cleaning C10K 1/00) |
| 2300/0903 | . . Feed preparation | 2300/1606 | . . . Combustion processes |
| 2300/0906 | . . . Physical processes, e.g. shredding, comminuting, chopping, sorting | 2300/1609 | . . . Post-reduction, e.g. on a red-white-hot coke or coal bed |
| 2300/0909 | . . . Drying | 2300/1612 | . . . CO ₂ -separation and sequestration, i.e. long time storage |
| 2300/0913 | . . Carbonaceous raw material | 2300/1615 | . . . Stripping |
| 2300/0916 | . . . Biomass | 2300/1618 | . . . Modification of synthesis gas composition, e.g. to meet some criteria |
| 2300/092 | Wood, cellulose | 2300/1621 | . . . Compression of synthesis gas |
| 2300/0923 | Sludge, e.g. from water treatment plant | 2300/1625 | . . with solids treatment |
| 2300/0926 | . . . Slurries comprising bio-oil or bio-coke, i.e. charcoal, obtained, e.g. by fast pyrolysis of biomass | 2300/1628 | . . . Ash post-treatment |
| 2300/093 | . . . Coal | 2300/1631 | Ash recycling |
| 2300/0933 | Coal fines for producing water gas | 2300/1634 | Ash vitrification |
| 2300/0936 | Coal fines for producing producer gas | 2300/1637 | . . . Char combustion |
| | | 2300/164 | . . with conversion of synthesis gas |
| | | 2300/1643 | . . . Conversion of synthesis gas to energy |
| | | 2300/1646 | integrated with a fuel cell (gasification of solids in fuel cells H01M 8/0643) |
| | | 2300/165 | integrated with a gas turbine or gas motor (gas turbine plants provided with a gas producer F02C 3/28 ; engines using solid fuels F02B 43/08) |

- 2300/1653 integrated in a gasification combined cycle
[IGCC] ([engines driven by heat coming from
a gasification or pyrolysis unit F01K 23/067](#))
- 2300/1656 . . . Conversion of synthesis gas to chemicals
- 2300/1659 to liquid hydrocarbons ([Fischer-Tropsch
process C10G 2/00](#))
- 2300/1662 to methane (SNG) ([production of synthetic
natural gas C10L 3/08](#))
- 2300/1665 to alcohols, e.g. methanol or ethanol
([preparation of alcohols in general
C07C 29/00](#))
- 2300/1668 to urea ([preparation of urea C07C 273/00](#));
to ammonia ([preparation of ammonia
C01C 1/0405](#))
- 2300/1671 . . with the production of electricity
- 2300/1675 . . . making use of a steam turbine
- 2300/1678 . . with air separation ([separating gases using
rectification of air F25J 3/04521](#))
- 2300/1681 . . with biological plants, e.g. involving bacteria,
algae, fungi
- 2300/1684 . . with electrolysis of water
- 2300/1687 . . with steam generation
- 2300/169 . . with water treatments ([treatment of water in
general or water purification C02F](#))
- 2300/1693 . . with storage facilities for intermediate, feed and/
or product
- 2300/1696 . . with phase separation, e.g. after condensation
- 2300/18 . . Details of the gasification process, e.g. loops,
autothermal operation
- 2300/1807 . . Recycle loops, e.g. gas, solids, heating medium,
water
- 2300/1815 . . . for carbon dioxide
- 2300/1823 . . . for synthesis gas
- 2300/183 . . Non-continuous or semi-continuous processes
([cyclic processes in fixed bed gasification
C10J 3/04](#))
- 2300/1838 . . Autothermal gasification by injection of oxygen
or steam
- 2300/1846 . . Partial oxidation, i.e. injection of air or oxygen
only
- 2300/1853 . . Steam reforming, i.e. injection of steam only
- 2300/1861 . . Heat exchange between at least two process
streams
- 2300/1869 . . . with one stream being air, oxygen or ozone
- 2300/1876 . . . with one stream being combustion gas
- 2300/1884 . . . with one stream being synthesis gas
- 2300/1892 . . . with one stream being water/steam