CPC COOPERATIVE PATENT CLASSIFICATION

F23G CREMATION FURNACES; CONSUMING WASTE PRODUCTS BY COMBUSTION

NOTE

This subclass covers also the burning of low-grade fuel of solid, liquid, or gaseous nature.

F23G 1/00 **Furnaces for cremation of human or animal carcasses**

F23G 5/00 **Incineration of waste** (of specific waste F23G 7/00)**; Incinerator constructions; Details, accessories or control therefor**

F23G 5/002 . {characterised by their grates (F23G 5/05 takes precedence)}

F23G 5/004 . . {with endless travelling grates}

F23G 5/006 . {General arrangement of incineration plant, e.g. flow sheets}

F23G 5/008 . {adapted for burning two or more kinds, e.g. liquid and solid, of waste being fed through separate inlets}

F23G 5/02 . with pretreatment

F23G 5/027 . . pyrolising or gasifying stage (pyrolisation of sludge C02F 11/00; destructive distillation of carbonaceous materials C10B 53/00)

F23G 5/0273 . . . {using indirect heating}

F23G 5/0276 . . . {using direct heating}

F23G 5/033 . . comminuting or crushing

F23G 5/04 . . drying

F23G 5/05 . . . using drying grates

F23G 5/08 . having supplementary heating

F23G 5/085 . . {High-temperature heating means, e.g. plasma, for partly melting the waste}

F23G 5/10 . . electric

F23G 5/12 . . using gaseous or liquid fuel (F23G 5/14 takes precedence)

F23G 5/14 . . including secondary combustion

F23G 5/16 . . . in a separate combustion chamber

F23G 5/165 . . . . {arranged at a different level}

F23G 5/18 . . . in a stack

F23G 5/20 . having rotating or oscillating drums

F23G 5/22 . . the drums being conically shaped

F23G 5/24 . having a vertical, substantially cylindrical, combustion chamber

F23G 5/245 . . {with perforated bottom or grate}

F23G 5/26 . . having rotating bottom

F23G 5/28 . . having raking arms

F23G 5/30 . having a fluidised bed

F23G 5/32 . the waste being subjected to a whirling movement, e.g. cyclonic incinerators

F23G 5/34 . the waste being burnt in a pit or arranged in a heap for combustion

F23G 5/36 . having a conical combustion chamber, e.g. "teepee" incinerators (F23G 5/22 takes precedence)

F23G 5/38 . Multi-hearth arrangements

F23G 5/40 . Portable or mobile incinerators

F23G 5/42 . . of the basket type

F23G 5/44 . Details; Accessories

F23G 5/442 . . {Waste feed arrangements}

F23G 5/444 . . . {for solid waste (F23G 5/448 takes precedence)}

F23G 5/446 . . . {for liquid waste (F23G 5/448 takes precedence)}

F23G 5/448 . . . {in which the waste is fed in containers or the like}

F23G 5/46 . . Recuperation of heat

F23G 5/48 . . Preventing corrosion

F23G 5/50 . Control or safety arrangements

F23G 7/00 **Incinerators or other apparatus for consuming industrial waste, e.g. chemicals** (incinerator closets A47K 11/02; oxidation of sludge C02F 11/06; burners in general, burner details F23D; incinerating radioactive waste G21F 9/00)

F23G 7/001 . {for sludges or waste products from water treatment installations (F23G 5/008 takes precedence)}

F23G 7/003 . {for used articles}

F23G 7/005 . . {cars, vehicles}

F23G 7/006 . . {wires, cables (production and refining of metals C22B, e.g. from scrap to produce non-ferrous metals C22B 7/00; salvaging material from cables H01B 15/003)}

F23G 7/008 . {for liquid waste (waste oil F23G 7/05, waste liquors F23G 7/04, sludges F23G 7/001)}

F23G 7/02 . of bagasse, megasse or the like

F23G 7/04 . of waste liquors, e.g. sulfite liquors

F23G 7/05 . of waste oils

F23G 7/06 . of waste gases or noxious gases, e.g. exhaust gases (exhaust apparatus for engines with means for rendering the exhaust innocuous, e.g. by thermal or catalytic conversion, F01N 3/08; combustion of uncombusted material from primary combustion within apparatus for combustion of solid or fluent fuel F23B, { of non combusted material from primary combustion of solid fuels F23B 5/00; of gases produced by primary combustion of solid fuels F23B 90/04}, F23C)

F23G 7/061 . . {with supplementary heating}

F23G 7/063 . . . {electric heating}

F23G 7/065 . . . {using gaseous or liquid fuel}

F23G 7/066 . . . . {preheating the waste gas by the heat of the combustion, e.g. recuperation type incinerator}

F23G 7/068 . . . . . {using regenerative heat recovery means}

F23G 7/07 . . in which combustion takes place in the presence of catalytic material

WARNING

F23G 7/07
(continued) This subgroup [IPC8] introduced in January 2006 is not complete. Documents from IPC7-based groups are in the process of being reorganised to this new group

F23G 7/08 . . using flares, e.g. in stacks
F23G 7/085 . . . {in stacks}
F23G 7/10 . of field or garden waste {or biomasses}
F23G 7/105 . . {of wood waste}
F23G 7/12 . of plastics, e.g. rubber
F23G 7/14 . of contaminated soil, e.g. by oil

F23G 2200/00 Waste incineration

F23G 2201/00 Pretreatment
F23G 2201/10 . Drying by heat
F23G 2201/101 . . using indirect heat transfer
F23G 2201/20 . Dewatering by mechanical means
F23G 2201/30 . Pyrolysing
F23G 2201/301 . . Treating pyrogases
F23G 2201/302 . . Treating pyrosolids
F23G 2201/303 . . Burning pyrogases
F23G 2201/304 . . Burning pyrosolids
F23G 2201/40 . Gasification
F23G 2201/50 . Devolatilising; from soil, objects
F23G 2201/60 . Separating
F23G 2201/601 . . different calorific values
F23G 2201/602 . . different sizes
F23G 2201/603 . . recyclible material
F23G 2201/70 . Blending
F23G 2201/701 . . with additives
F23G 2201/702 . . with other waste
F23G 2201/80 . Shredding
F23G 2201/90 . Cooling

F23G 2202/00 Combustion
F23G 2202/10 . in two or more stages
F23G 2202/101 . . with controlled oxidant supply
F23G 2202/102 . . with supplementary heating
F23G 2202/103 . . in separate chambers
F23G 2202/104 . . with ash melting stage
F23G 2202/105 . . with waste supply in stages
F23G 2202/106 . . with recirculation of unburned solid or gaseous matter into combustion chamber

F23G 2202/20 . to temperatures melting waste
F23G 2202/30 . in a pressurised chamber
F23G 2202/40 . in a pulsed combustion chamber
F23G 2202/50 . in a matrix bed combustion chamber
F23G 2202/60 . in a catalytic combustion chamber
F23G 2202/70 . with application of specific energy
F23G 2202/701 . . Electrical fields
F23G 2202/703 . . Acoustic energy

F23G 2203/00 Furnace arrangements
F23G 2203/10 . Stoker grate furnace
F23G 2203/101 . with stepped or inclined grate
F23G 2203/103 . with roller grate
F23G 2203/105 . with endless chain or travelling grate
F23G 2203/107 . with vibrating grate
F23G 2203/20 . Rotary drum furnace
F23G 2203/201 . . using oscillating movement
F23G 2203/202 . . rotating around substantially vertical axis
F23G 2203/203 . . with conically shaped drum
F23G 2203/204 . . having non-circular inner cross-section
F23G 2203/205 . . with water-cooled wall
F23G 2203/206 . . with charging ports in the sidewall
F23G 2203/207 . . with air supply ports in the sidewall
F23G 2203/208 . . with interior agitating members
F23G 2203/209 . . with variable inclination of rotation axis
F23G 2203/21 . . with variable speed of rotation
F23G 2203/211 . . Arrangement of a plurality of drums
F23G 2203/212 . . Sealing arrangements between rotary and stationnary parts
F23G 2203/30 . Cyclonic combustion furnace
F23G 2203/40 . Stationary bed furnace
F23G 2203/401 . . with support for a grate or perforated plate
F23G 2203/403 . . with substantial cylindrical combustion chamber
F23G 2203/50 . Fluidised bed furnace
F23G 2203/501 . . with external recirculation of entrained bed material
F23G 2203/502 . . with recirculation of bed material inside combustion chamber
F23G 2203/503 . . with two or more fluidised beds
F23G 2203/504 . . with essentially horizontal flow of bed material
F23G 2203/505 . . with fluidised bed rotated as a whole
F23G 2203/60 . Mobile furnace
F23G 2203/601 . . carried by a vehicle

F23G 2203/70 . Modular furnace
F23G 2203/80 . Furnaces with other means for moving the waste through the combustion zone
F23G 2203/801 . . using conveyors
F23G 2203/8013 . . . Screw conveyors
F23G 2203/8016 . . . Belt conveyors
F23G 2203/803 . . Rams or pushers
F23G 2203/805 . . using a rotating hearth

F23G 2204/00 Supplementary heating arrangements
F23G 2204/10 . using auxiliary fuel
F23G 2204/101 . . solid fuel
F23G 2204/103 . . gaseous or liquid fuel
F23G 2204/20 . using electric energy
F23G 2204/201 . . Plasma
F23G 2204/202 . . Laser
F23G 2204/203 . . Microwave
F23G 2204/204 . . Induction

F23G 2205/00 Waste feed arrangements
F23G 2205/10 . using ram or pusher
F23G 2205/101 . . sequentially operated
F23G 2205/12 . using conveyors
F23G 2205/121 . . Screw conveyor
F23G 2205/122 . . Belt conveyor
F23G 2205/123 . . Roller conveyor
F23G 2205/124 . . Chain conveyor
F23G 2205/125 . . Vibrating conveyor
F23G 2205/14 . using hopper or bin
F23G 2205/16 . using chute
F23G 2205/18 . using airlock systems
F23G 2205/20 . using airblast or pneumatic feeding

F23G 2206/00 Waste heat recuperation
F23G 2206/10 . reintroducing the heat in the same process, e.g. for predrying
F23G 2206/20 . using the heat in association with another installation
F23G 2206/201 . . with an industrial furnace
F23G 2206/202 . . with an internal combustion engine
F23G 2206/203 . . with a power/heat generating installation

F23G 2207/00 Control
F23G 2207/10 . Arrangement of sensing devices

F23G 2207/101 . . for temperature
F23G 2207/1015 . . . Heat pattern monitoring of flames
F23G 2207/102 . . for pressure
F23G 2207/103 . . for oxygen
F23G 2207/104 . . for CO or CO_2
F23G 2207/105 . . for NOx
F23G 2207/106 . . for SOx
F23G 2207/107 . . for halogen concentration
F23G 2207/108 . . for hydrocarbon concentration
F23G 2207/112 . . for waste supply flowrate
F23G 2207/113 . . for oxidant supply flowrate
F23G 2207/114 . . for combustion bed level
F23G 2207/20 . Waste supply
F23G 2207/30 . Oxidant supply
F23G 2207/40 . Supplementary heat supply
F23G 2207/50 . Cooling fluid supply
F23G 2207/60 . Additives supply

F23G 2208/00 Safety aspects
F23G 2208/10 . Preventing or abating fire or explosion, e.g. by purging

F23G 2209/00 Specific waste
F23G 2209/10 . Liquid waste
F23G 2209/101 . . Waste liquor
F23G 2209/102 . . Waste oil
F23G 2209/103 . . Bagasse, megasse
F23G 2209/12 . Sludge, slurries or mixtures of liquids
F23G 2209/14 . Gaseous waste or fumes
F23G 2209/141 . . Explosive gases
F23G 2209/142 . . Halogen gases, e.g. silane
F23G 2209/16 . Warfare materials, e.g. ammunition
F23G 2209/18 . Radioactive materials
F23G 2209/20 . Medical materials
F23G 2209/22 . Waste papers
F23G 2209/24 . Contaminated soil; foundry sand
F23G 2209/26 . Biowaste
F23G 2209/261 . . Woodwaste
F23G 2209/262 . . Agricultural waste
F23G 2209/28 . Plastics or rubber like materials
F23G 2209/281 . . Tyres
F23G 2209/30 . Solid combustion residus, e.g. bottom or flyash

F23G 2900/00 **Special features of, or arrangements for incinerators**

F23G 2900/00001 . Exhaust gas recirculation (using the heat thereof F23G 2206/10)
F23G 2900/50001 . Combination of two or more furnaces
F23G 2900/50002 . Burning with downwards directed draft through the waste mass
F23G 2900/50003 . Waste oxidation, pyrolysis or gasification in water under supercritical conditions
F23G 2900/50004 . Furnace with inclined hearth
F23G 2900/50005 . Waste in combustion chamber supported on bed made of special materials
F23G 2900/50006 . Combustion chamber walls reflecting radiant energy within the chamber
F23G 2900/50007 . Co-combustion of two or more kinds of waste, separately fed into the furnace
F23G 2900/50008 . Combustion of waste suspended or lifted by upward gas flows
F23G 2900/50009 . Furnace with progressive waste movements in vertical or steeply inclined direction
F23G 2900/50201 . Waste pyrolysis, gasification or cracking by indirect heat transfer
F23G 2900/50202 . Waste pyrolysis, gasification or cracking in presence of catalysts
F23G 2900/50203 . Waste pyrolysis, gasification or cracking in a mechanically fluidised bed, e.g. obtained by a centrifugal force
F23G 2900/50204 . Waste pre-treatment by pyrolysis, gasification or cracking
F23G 2900/50205 . Waste pre-treatment by pyrolysis, gasification or cracking followed by condensation of gas into combustible oil or fat
F23G 2900/50206 . Pelletising waste before combustion
F23G 2900/50207 . Thermoforming of plastic waste materials before combustion
F23G 2900/50208 . Biologic treatment before burning, e.g. biogas generation
F23G 2900/50209 . Compacting waste before burning
F23G 2900/50211 . Evaporating, e.g. liquid waste before burning
F23G 2900/50212 . Extruding waste before combustion
F23G 2900/50213 . Preheating processes other than drying or pyrolysis
F23G 2900/50214 . Separating non combustible matters
F23G 2900/50401 . Drying waste by mixing with drying chemicals, e.g. with CaO
F23G 2900/508 . Providing additional energy for combustion, e.g. by using supplementary heating
F23G 2900/50801 . using the heat from externally heated bodies, e.g. steel balls
F23G 2900/50802 . . using solid propellant
F23G 2900/50803 . . using solar energy
F23G 2900/50804 . . using thermit or other compositions of metal oxides as auxiliary fuel
F23G 2900/51001 . . using arc discharge electrodes to provide heat
F23G 2900/52001 . Rotary drums with co-current flows of waste and gas
F23G 2900/52002 . Rotary drum furnaces with counter-current flows of waste and gas
F23G 2900/52003 . Rotary drum furnaces with foramenous drum walls, e.g. grate drums
F23G 2900/53801 . Multi-hearth furnaces with vertical axis
F23G 2900/54001 . Hearths or supports movable into and from the furnace, e.g. by a conveyor
F23G 2900/54401 . Feeding waste in containers, bags or barrels
F23G 2900/54402 . Injecting fluid waste into incinerator

F23G 2900/54601 . using waste heat for desalinating sea water
F23G 2900/55 . Controlling; Monitoring or measuring
F23G 2900/55001 . . Controlling combustion air preheating
F23G 2900/55002 . . Sensing exhaust gas opacity
F23G 2900/55003 . . Sensing for exhaust gas properties, e.g. O_2 content
F23G 2900/55004 . . Sensing exhaust gas radioactivity
F23G 2900/55005 . . Sensing ash or slag properties
F23G 2900/55006 . . Measuring material flow rates
F23G 2900/55007 . . Sensors arranged in waste loading zone, e.g. feed hopper level
F23G 2900/55008 . . Measuring produced steam flow rate
F23G 2900/55009 . . Controlling stoker grate speed or vibrations for waste movement
F23G 2900/55011 . . Detecting the properties of waste to be incinerated, e.g. heating value, density
F23G 2900/70 . Incinerating particular products or waste
F23G 2900/7001 . . Air bags or seat belt pre-tensioners
F23G 2900/7002 . . Animal fat, e.g. lard, tallow, stearin
F23G 2900/7003 . . Incinerating litter from animals, e.g. poultry litter
F23G 2900/7004 . . Incinerating contaminated animal meals
F23G 2900/7005 . . Incinerating used asbestos
F23G 2900/7006 . . Incinerating used automobiles
F23G 2900/7007 . . Incinerating or pyrolysing used batteries
F23G 2900/7008 . . Incinerating remains of building materials after demolishing, e.g. fibreglass asphalt shingles
F23G 2900/7009 . . Incinerating human or animal corpses or remains
F23G 2900/7011 . . Incinerating PCB-materials
F23G 2900/7012 . . Incinerating rice or grain husks, hulls or bran
F23G 2900/7013 . . Incinerating oil shales
F23G 2900/70401 . . Incinerating drainage water from waste pits of incinerators
F23G 2900/70601 . Temporary storage means, e.g. buffers for accumulating fumes or gases, between treatment stages