

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.

Guidance heading:**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

.. pyrolysing or gasifying stage (pyrolysis 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

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

Guidance heading:

F23G 2200/00 Waste incineration

Guidance heading:

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 CO2
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

Guidance heading:

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. O₂ 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 2900/70001	..	Air bags or seat belt pre-tensioners
F23G 2900/70002	..	Animal fat, e.g. lard, tallow, stearin
F23G 2900/70003	..	Incinerating litter from animals, e.g. poultry litter
F23G 2900/70004	..	Incinerating contaminated animal meals
F23G 2900/70005	..	Incinerating used asbestos
F23G 2900/70006	..	Incinerating used automobiles
F23G 2900/70007	..	Incinerating or pyrolysing used batteries
F23G 2900/70008	..	Incinerating remains of building materials after demolishing, e.g. fibreglass asphalt shingles
F23G 2900/70009	..	Incinerating human or animal corpses or remains
F23G 2900/7001	..	Air bags or seat belt pre-tensioners
F23G 2900/70011	..	Incinerating PCB-materials
F23G 2900/70012	..	Incinerating rice or grain husks, hulls or bran
F23G 2900/70013	..	Incinerating oil shales
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