

CPC COOPERATIVE PATENT CLASSIFICATION

F MECHANICAL ENGINEERING; LIGHTING; HEATING; WEAPONS; BLASTING (NOTE omitted)

LIGHTING; HEATING

F23 COMBUSTION APPARATUS; COMBUSTION PROCESSES (NOTE omitted)

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.

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 | Furnaces for cremation of human or animal carcasses | 5/32 | • the waste being subjected to a whirling movement, e.g. cyclonic incinerators |
| 5/00 | Incineration of waste (of specific waste F23G 7/00); Incinerator constructions; Details, accessories or control therefor | 5/34 | • the waste being burnt in a pit or arranged in a heap for combustion |
| 5/002 | • {characterised by their grates (F23G 5/05 takes precedence)} | 5/36 | • having a conical combustion chamber, e.g. "teepee" incinerators (F23G 5/22 takes precedence) |
| 5/004 | • . . {with endless travelling grates} | 5/38 | • Multi-hearth arrangements |
| 5/006 | • {General arrangement of incineration plant, e.g. flow sheets} | 5/40 | • Portable or mobile incinerators |
| 5/008 | • {adapted for burning two or more kinds, e.g. liquid and solid, of waste being fed through separate inlets} | 5/42 | • . . of the basket type |
| 5/02 | • with pretreatment | 5/44 | • Details; Accessories |
| 5/027 | • . . pyrolysing or gasifying stage (pyrolysis of sludge C02F 11/00; destructive distillation of carbonaceous materials C10B 53/00) | 5/442 | • . . {Waste feed arrangements} |
| 5/0273 | • . . . {using indirect heating} | 5/444 | • . . . {for solid waste (F23G 5/448 takes precedence)} |
| 5/0276 | • . . . {using direct heating} | 5/446 | • . . . {for liquid waste (F23G 5/448 takes precedence)} |
| 5/033 | • . . comminuting or crushing | 5/448 | • . . . {in which the waste is fed in containers or the like} |
| 5/04 | • . . drying | 5/46 | • . . Recuperation of heat |
| 5/05 | • . . . using drying grates | 5/48 | • . . Preventing corrosion |
| 5/08 | • having supplementary heating | 5/50 | • Control or safety arrangements |
| 5/085 | • . . {High-temperature heating means, e.g. plasma, for partly melting the waste} | 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) |
| 5/10 | • . . electric | 7/001 | • {for sludges or waste products from water treatment installations (F23G 5/008 takes precedence)} |
| 5/12 | • . . using gaseous or liquid fuel (F23G 5/14 takes precedence) | 7/003 | • {for used articles} |
| 5/14 | • . . including secondary combustion | 7/005 | • . . {cars, vehicles} |
| 5/16 | • . . . in a separate combustion chamber | 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)} |
| 5/165 | • {arranged at a different level} | 7/008 | • {for liquid waste (waste oil F23G 7/05, waste liquors F23G 7/04, sludges F23G 7/001)} |
| 5/18 | • . . . in a stack | 7/02 | • of bagasse, megasse or the like |
| 5/20 | • having rotating or oscillating drums | 7/04 | • of waste liquors, e.g. sulfite liquors |
| 5/22 | • . . the drums being conically shaped | 7/05 | • of waste oils |
| 5/24 | • having a vertical, substantially cylindrical, combustion chamber | | |
| 5/245 | • . . {with perforated bottom or grate} | | |
| 5/26 | • . . having rotating bottom | | |
| 5/28 | • . . having raking arms | | |
| 5/30 | • having a fluidised bed | | |

7/06	<ul style="list-style-type: none"> 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) 	2202/701	<ul style="list-style-type: none"> Electrical fields
		2202/703	<ul style="list-style-type: none"> Acoustic energy
		2203/00	Furnace arrangements
7/061	<ul style="list-style-type: none"> {with supplementary heating} 	2203/10	<ul style="list-style-type: none"> Stoker grate furnace
7/063	<ul style="list-style-type: none"> {electric heating} 	2203/101	<ul style="list-style-type: none"> with stepped or inclined grate
7/065	<ul style="list-style-type: none"> {using gaseous or liquid fuel} 	2203/103	<ul style="list-style-type: none"> with roller grate
7/066	<ul style="list-style-type: none"> {preheating the waste gas by the heat of the combustion, e.g. recuperation type incinerator} 	2203/105	<ul style="list-style-type: none"> with endless chain or travelling grate
		2203/107	<ul style="list-style-type: none"> with vibrating grate
		2203/20	<ul style="list-style-type: none"> Rotary drum furnace
7/068	<ul style="list-style-type: none"> {using regenerative heat recovery means} 	2203/201	<ul style="list-style-type: none"> using oscillating movement
7/07	<ul style="list-style-type: none"> in which combustion takes place in the presence of catalytic material 	2203/202	<ul style="list-style-type: none"> rotating around substantially vertical axis
		2203/203	<ul style="list-style-type: none"> with conically shaped drum
7/08	<ul style="list-style-type: none"> using flares, e.g. in stacks 	2203/204	<ul style="list-style-type: none"> having non-circular inner cross-section
7/085	<ul style="list-style-type: none"> {in stacks} 	2203/205	<ul style="list-style-type: none"> with water-cooled wall
7/10	<ul style="list-style-type: none"> of field or garden waste {or biomasses} 	2203/206	<ul style="list-style-type: none"> with charging ports in the sidewall
7/105	<ul style="list-style-type: none"> {of wood waste} 	2203/207	<ul style="list-style-type: none"> with air supply ports in the sidewall
7/12	<ul style="list-style-type: none"> of plastics, e.g. rubber 	2203/208	<ul style="list-style-type: none"> with interior agitating members
7/14	<ul style="list-style-type: none"> of contaminated soil, e.g. by oil 	2203/209	<ul style="list-style-type: none"> with variable inclination of rotation axis
		2203/21	<ul style="list-style-type: none"> with variable speed of rotation
		2203/211	<ul style="list-style-type: none"> Arrangement of a plurality of drums
		2203/212	<ul style="list-style-type: none"> Sealing arrangements between rotary and stationary parts
		2203/30	<ul style="list-style-type: none"> Cyclonic combustion furnace
		2203/40	<ul style="list-style-type: none"> Stationary bed furnace
		2203/401	<ul style="list-style-type: none"> with support for a grate or perforated plate
		2203/403	<ul style="list-style-type: none"> with substantial cylindrical combustion chamber
		2203/50	<ul style="list-style-type: none"> Fluidised bed furnace
		2203/501	<ul style="list-style-type: none"> with external recirculation of entrained bed material
		2203/502	<ul style="list-style-type: none"> with recirculation of bed material inside combustion chamber
		2203/503	<ul style="list-style-type: none"> with two or more fluidised beds
		2203/504	<ul style="list-style-type: none"> with essentially horizontal flow of bed material
		2203/505	<ul style="list-style-type: none"> with fluidised bed rotated as a whole
		2203/60	<ul style="list-style-type: none"> Mobile furnace
		2203/601	<ul style="list-style-type: none"> carried by a vehicle
		2203/70	<ul style="list-style-type: none"> Modular furnace
		2203/80	<ul style="list-style-type: none"> Furnaces with other means for moving the waste through the combustion zone
		2203/801	<ul style="list-style-type: none"> using conveyors
		2203/8013	<ul style="list-style-type: none"> Screw conveyors
		2203/8016	<ul style="list-style-type: none"> Belt conveyors
		2203/803	<ul style="list-style-type: none"> Rams or pushers
		2203/805	<ul style="list-style-type: none"> using a rotating hearth
		2204/00	Supplementary heating arrangements
		2204/10	<ul style="list-style-type: none"> using auxiliary fuel
		2204/101	<ul style="list-style-type: none"> solid fuel
		2204/103	<ul style="list-style-type: none"> gaseous or liquid fuel
		2204/20	<ul style="list-style-type: none"> using electric energy
		2204/201	<ul style="list-style-type: none"> Plasma
		2204/202	<ul style="list-style-type: none"> Laser
		2204/203	<ul style="list-style-type: none"> Microwave
		2204/204	<ul style="list-style-type: none"> Induction
		2205/00	Waste feed arrangements
		2205/10	<ul style="list-style-type: none"> using ram or pusher
		2205/101	<ul style="list-style-type: none"> sequentially operated
		2205/12	<ul style="list-style-type: none"> using conveyors
		2205/121	<ul style="list-style-type: none"> Screw conveyor
		2205/122	<ul style="list-style-type: none"> Belt conveyor
		2205/123	<ul style="list-style-type: none"> Roller conveyor
2200/00	Waste incineration		
2201/00	Pretreatment		
2201/10	<ul style="list-style-type: none"> Drying by heat 		
2201/101	<ul style="list-style-type: none"> using indirect heat transfer 		
2201/20	<ul style="list-style-type: none"> Dewatering by mechanical means 		
2201/30	<ul style="list-style-type: none"> Pyrolysing 		
2201/301	<ul style="list-style-type: none"> Treating pyrogases 		
2201/302	<ul style="list-style-type: none"> Treating pyrosolids 		
2201/303	<ul style="list-style-type: none"> Burning pyrogases 		
2201/304	<ul style="list-style-type: none"> Burning pyrosolids 		
2201/40	<ul style="list-style-type: none"> Gasification 		
2201/50	<ul style="list-style-type: none"> Devolatilising; from soil, objects 		
2201/60	<ul style="list-style-type: none"> Separating 		
2201/601	<ul style="list-style-type: none"> different calorific values 		
2201/602	<ul style="list-style-type: none"> different sizes 		
2201/603	<ul style="list-style-type: none"> recyclable material 		
2201/70	<ul style="list-style-type: none"> Blending 		
2201/701	<ul style="list-style-type: none"> with additives 		
2201/702	<ul style="list-style-type: none"> with other waste 		
2201/80	<ul style="list-style-type: none"> Shredding 		
2201/90	<ul style="list-style-type: none"> Cooling 		
2202/00	Combustion		
2202/10	<ul style="list-style-type: none"> in two or more stages 		
2202/101	<ul style="list-style-type: none"> with controlled oxidant supply 		
2202/102	<ul style="list-style-type: none"> with supplementary heating 		
2202/103	<ul style="list-style-type: none"> in separate chambers 		
2202/104	<ul style="list-style-type: none"> with ash melting stage 		
2202/105	<ul style="list-style-type: none"> with waste supply in stages 		
2202/106	<ul style="list-style-type: none"> with recirculation of unburned solid or gaseous matter into combustion chamber 		
2202/20	<ul style="list-style-type: none"> to temperatures melting waste 		
2202/30	<ul style="list-style-type: none"> in a pressurised chamber 		
2202/40	<ul style="list-style-type: none"> in a pulsed combustion chamber 		
2202/50	<ul style="list-style-type: none"> in a matrix bed combustion chamber 		
2202/60	<ul style="list-style-type: none"> in a catalytic combustion chamber 		
2202/70	<ul style="list-style-type: none"> with application of specific energy 		

2205/124	. . Chain conveyor	2900/50001	. Combination of two or more furnaces
2205/125	. . Vibrating conveyor	2900/50002	. Burning with downwards directed draft through the waste mass
2205/14	. using hopper or bin	2900/50003	. Waste oxidation, pyrolysis or gasification in water under supercritical conditions
2205/16	. using chute	2900/50004	. Furnace with inclined hearth
2205/18	. using airlock systems	2900/50005	. Waste in combustion chamber supported on bed made of special materials
2205/20	. using airblast or pneumatic feeding	2900/50006	. Combustion chamber walls reflecting radiant energy within the chamber
2206/00	Waste heat recuperation	2900/50007	. Co-combustion of two or more kinds of waste, separately fed into the furnace
2206/10	. reintroducing the heat in the same process, e.g. for predrying	2900/50008	. Combustion of waste suspended or lifted by upward gas flows
2206/20	. using the heat in association with another installation	2900/50009	. Furnace with progressive waste movements in vertical or steeply inclined direction
2206/201	. . with an industrial furnace	2900/50201	. Waste pyrolysis, gasification or cracking by indirect heat transfer
2206/202	. . with an internal combustion engine	2900/50202	. Waste pyrolysis, gasification or cracking in presence of catalysts
2206/203	. . with a power/heat generating installation	2900/50203	. Waste pyrolysis, gasification or cracking in a mechanically fluidised bed, e.g. obtained by a centrifugal force
2207/00	Control	2900/50204	. Waste pre-treatment by pyrolysis, gasification or cracking
2207/10	. Arrangement of sensing devices	2900/50205	. Waste pre-treatment by pyrolysis, gasification or cracking followed by condensation of gas into combustible oil or fat
2207/101	. . for temperature	2900/50206	. Pelletising waste before combustion
2207/1015	. . . Heat pattern monitoring of flames	2900/50207	. Thermoforming of plastic waste materials before combustion
2207/102	. . for pressure	2900/50208	. Biologic treatment before burning, e.g. biogas generation
2207/103	. . for oxygen	2900/50209	. Compacting waste before burning
2207/104	. . for CO or CO ₂	2900/50211	. Evaporating, e.g. liquid waste before burning
2207/105	. . for NO _x	2900/50212	. Extruding waste before combustion
2207/106	. . for SO _x	2900/50213	. Preheating processes other than drying or pyrolysis
2207/107	. . for halogen concentration	2900/50214	. Separating non combustible matters
2207/108	. . for hydrocarbon concentration	2900/50401	. Drying waste by mixing with drying chemicals, e.g. with CaO
2207/112	. . for waste supply flowrate	2900/508	. Providing additional energy for combustion, e.g. by using supplementary heating
2207/113	. . for oxidant supply flowrate	2900/50801	. . using the heat from externally heated bodies, e.g. steel balls
2207/114	. . for combustion bed level	2900/50802	. . using solid propellant
2207/20	. Waste supply	2900/50803	. . using solar energy
2207/30	. Oxidant supply	2900/50804	. . using thermit or other compositions of metal oxides as auxiliary fuel
2207/40	. Supplementary heat supply	2900/51001	. . using arc discharge electrodes to provide heat
2207/50	. Cooling fluid supply	2900/52001	. Rotary drums with co-current flows of waste and gas
2207/60	. Additives supply	2900/52002	. Rotary drum furnaces with counter-current flows of waste and gas
2208/00	Safety aspects	2900/52003	. Rotary drum furnaces with foramenous drum walls, e.g. grate drums
2208/10	. Preventing or abating fire or explosion, e.g. by purging	2900/53801	. Multi-hearth furnaces with vertical axis
2209/00	Specific waste	2900/54001	. Hearths or supports movable into and from the furnace, e.g. by a conveyor
2209/10	. Liquid waste	2900/54401	. Feeding waste in containers, bags or barrels
2209/101	. . Waste liquor	2900/54402	. Injecting fluid waste into incinerator
2209/102	. . Waste oil	2900/54601	. using waste heat for desalinating sea water
2209/103	. . Bagasse, megasse	2900/55	. Controlling; Monitoring or measuring
2209/12	. Sludge, slurries or mixtures of liquids	2900/55001	. . Controlling combustion air preheating
2209/14	. Gaseous waste or fumes		
2209/141	. . Explosive gases		
2209/142	. . Halogen gases, e.g. silane		
2209/16	. Warfare materials, e.g. ammunition		
2209/18	. Radioactive materials		
2209/20	. Medical materials		
2209/22	. Waste papers		
2209/24	. Contaminated soil; foundry sand		
2209/26	. Biowaste		
2209/261	. . Woodwaste		
2209/262	. . Agricultural waste		
2209/28	. Plastics or rubber like materials		
2209/281	. . Tyres		
2209/30	. Solid combustion residues, e.g. bottom or flyash		
2900/00	Special features of, or arrangements for incinerators		
2900/00001	. Exhaust gas recirculation		

- 2900/55002 . . Sensing exhaust gas opacity
- 2900/55003 . . Sensing for exhaust gas properties, e.g. O₂ content
- 2900/55004 . . Sensing exhaust gas radioactivity
- 2900/55005 . . Sensing ash or slag properties
- 2900/55006 . . Measuring material flow rates
- 2900/55007 . . Sensors arranged in waste loading zone, e.g. feed hopper level
- 2900/55008 . . Measuring produced steam flow rate
- 2900/55009 . . Controlling stoker grate speed or vibrations for waste movement
- 2900/55011 . . Detecting the properties of waste to be incinerated, e.g. heating value, density
- 2900/70 . . Incinerating particular products or waste
- 2900/7001 . . Air bags or seat belt pre-tensioners
- 2900/7002 . . Animal fat, e.g. lard, tallow, stearin
- 2900/7003 . . Incinerating litter from animals, e.g. poultry litter
- 2900/7004 . . Incinerating contaminated animal meals
- 2900/7005 . . Incinerating used asbestos
- 2900/7006 . . Incinerating used automobiles
- 2900/7007 . . Incinerating or pyrolysing used batteries
- 2900/7008 . . Incinerating remains of building materials after demolishing, e.g. fibreglass asphalt shingles
- 2900/7009 . . Incinerating human or animal corpses or remains
- 2900/7011 . . Incinerating PCB-materials
- 2900/7012 . . Incinerating rice or grain husks, hulls or bran
- 2900/7013 . . Incinerating oil shales
- 2900/70401 . . Incinerating drainage water from waste pits of incinerators
- 2900/70601 . . Temporary storage means, e.g. buffers for accumulating fumes or gases, between treatment stages