

# CPC COOPERATIVE PATENT CLASSIFICATION

**F23B METHODS OR APPARATUS FOR COMBUSTION USING ONLY SOLID FUEL** (for combustion of fuels that are solid at room temperatures, but burned in melted form, e.g. candle wax, [C11C 5/00](#), [F23C](#), [F23D](#); using solid fuel suspended in air [F23C](#), [F23D 1/00](#); using solid fuel suspended in liquids [F23C](#), [F23D 11/00](#); using solid fuel and fluent fuel simultaneously or alternately [F23C](#), [F23D 17/00](#); burning of low grade fuel [F23G](#); grates [F23H](#); feeding solid fuel to combustion apparatus [F23K](#); combustion chambers, not otherwise provided for [F23M](#); domestic apparatus [F24](#); central heating boilers [F24D](#); package boilers [F24H](#))

## NOTE

This subclass is only concerned with the combustion of lump fuel, or of pulverulent or granulated fuel if no use is made of its fluent nature.

## IPC7 groups

- 1/00 {Combustion apparatus using only lump fuel}**
- 1/02 . {for indirect heating of a medium in a vessel, e.g. for boiling water ([steam generation F22](#))}
- 1/04 . . {External furnaces, i.e. with furnace in front of the vessel}
- 1/06 . . . {for heating water-tube boilers, e.g. Tenbrink flue furnaces}
- 1/08 . . {Internal furnaces, i.e. with furnaces inside the vessel}
- 1/10 . . . {for heating locomotive boilers}
- 1/12 . . {with a plurality of combustion chambers}
- 1/16 . {the combustion apparatus being modified according to the form of grate or other fuel support ([for incinerators F23G 5/002](#))}
- 1/165 . . {using roller grate}
- 1/18 . . {using inclined grate}
- 1/20 . . {using step-type grate}
- 1/22 . . {using travelling grate}
- 1/24 . . {using rotating grate}
- 1/26 . . {using imperforate fuel supports}
- 1/28 . . {using ridge-type grate, e.g. for combustion of peat, sawdust, or pulverulent fuel ([combustion of peat, sawdust F23G 7/10](#))}
- 1/30 . {characterised by the form of combustion chamber}
- 1/32 . . {rotating}
- 1/34 . . {annular}
- 1/36 . . {shaft-type}
- 1/38 . . {for combustion of peat, sawdust, or pulverulent fuel on a grate or other fuel support ([combustion of peat, sawdust F23G 7/10](#))}
- 3/00 {Combustion apparatus which is portable or removable with respect to the boiler or other apparatus which is heated}**
- 5/00 {Combustion apparatus with arrangements for burning uncombusted material from primary combustion (combustion apparatus characterised by the combination of two or more combustion chambers [F23C 6/00](#); the primary combustion being pulverulent fuel [F23C 9/003](#))}**
- 5/02 . {in main combustion chamber}
- 5/025 . . {recirculating uncombusted solids to combustion chamber}

- 5/04 . {in separate combustion chamber; on separate grate}
- 7/00 {Combustion techniques; Other solid-fuel combustion apparatus}**
- 7/002 . {characterised by gas flow arrangements}
- 7/005 . . {with downdraught through fuel bed and grate}
- 7/007 . . {with fluegas recirculation to combustion chamber}

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- 10/00 Combustion apparatus characterised by the combination of two or more combustion chambers**
- 10/02 . including separate secondary combustion chambers
- 20/00 Combustion apparatus specially adapted for portability or transportability**
- 30/00 Combustion apparatus with driven means for agitating the burning fuel; Combustion apparatus with driven means for advancing the burning fuel through the combustion chamber**
- 30/02 . with movable, e.g. vibratable, fuel-supporting surfaces; with fuel-supporting surfaces that have movable parts
- 30/04 . . with fuel-supporting surfaces that are rotatable around a horizontal or inclined axis and support the fuel on their inside, e.g. cylindrical grates
- 30/06 . . with fuel supporting surfaces that are specially adapted for advancing fuel through the combustion zone
- 30/08 . . . with fuel-supporting surfaces that move through the combustion zone, e.g. with chain grates
- 30/10 . . . with fuel-supporting surfaces having fuel advancing elements that are movable, but remain essentially in the same place, e.g. with rollers or reciprocating grate bars
- 40/00 Combustion apparatus with driven means for feeding fuel into the combustion chamber**
- 40/02 . the fuel being fed by scattering over the fuel-supporting surface
- 40/04 . the fuel being fed from below through an opening in the fuel-supporting surface
- 40/06 . the fuel being fed along the fuel-supporting surface
- 40/08 . . into pot- or through-shaped grates

<b>50/00</b>	<b>Combustion apparatus in which the fuel is fed into or through the combustion zone by gravity, e.g. from a fuel storage situated above the combustion zone</b>	2700/004	. adapted for use in Tenbrink boilers
50/02	. the fuel forming a column, stack or thick layer with the combustion zone at its bottom	2700/005	. adapted for use in locomotives
50/04	. . the movement of combustion air and flue gases being substantially transverse to the movement of the fuel	2700/006	. Details of locomotive combustion apparatus
50/06	. . the fuel gases being removed downwards through one or more openings in the fuel-supporting surface	2700/007	. with pressurised combustion chambers
50/08	. . with fuel-deflecting bodies forming free combustion spaces inside the fuel layer	2700/008	. with interchangeable combustion chambers
50/10	. . with the combustion zone at the bottom of fuel-filled conduits ending at the surface of a fuel bed	2700/009	. adapted for use in various steam boilers
50/12	. the fuel being fed to the combustion zone by free fall or by sliding along inclined surfaces, e.g. from a conveyor terminating above the fuel bed	2700/01	. adapted for boilers built up from sections
		2700/011	. with fuel shaft for steam boilers
		2700/012	. with predrying in fuel supply area
		2700/013	. for use in baking ovens or cooking vessels
		2700/014	. for use in reverberatory furnaces
		2700/018	. with fume afterburning by staged combustion
		2700/022	. with various types of fume afterburners
		2700/023	. with various arrangements not otherwise provided for
		2700/037	. Burners for solid or solidified fuel, e.g. metaldehyde blocks
<b>60/00</b>	<b>Combustion apparatus in which the fuel burns essentially without moving</b>		
60/02	. with combustion air supplied through a grate		
<b>70/00</b>	<b>Combustion apparatus characterised by means returning solid combustion residues to the combustion chamber</b>	<b>2900/00</b>	<b>Special features of, or arrangements for combustion apparatus using solid fuels; Combustion processes therefor</b>
<b>80/00</b>	<b>Combustion apparatus characterised by means creating a distinct flow path for flue gases or for non-combusted gases given off by the fuel</b>	2900/00001	. Combustion chambers with integrated fuel hopper
80/02	. by means for returning flue gases to the combustion chamber or to the combustion zone	2900/00003	. Combustion devices specially adapted for burning metal fuels, e.g. Al or Mg
80/04	. by means for guiding the flow of flue gases, e.g. baffles	2900/00004	. Means for generating pulsating combustion of solid fuel
<b>90/00</b>	<b>Combustion methods not related to a particular type of apparatus</b>	2900/00005	. Means for applying acoustical energy to flame
	<b>NOTE</b>	2900/00006	. Means for applying electricity to flame, e.g. an electric field
	Groups <a href="#">F23B 90/00</a> - <a href="#">F23B 90/08</a> correspond to IPC2012.01	2900/99001	. Retrofitting or converting solid fuel stoves to gas or liquid fuels
90/02	. Start-up techniques		
90/04	. including secondary combustion ( <a href="#">in separate combustion chambers F23B 10/02</a> )		
90/06	. . the primary combustion being a gasification or pyrolysis in a reductive atmosphere		
90/08	. . in the presence of catalytic material		
<b>99/00</b>	<b>Subject matter not provided for in other groups of this subclass</b>		
<b>2101/00</b>	<b>Adaptation of combustion apparatus to boilers in which the combustion chamber is situated inside the boiler vessel, e.g. surrounded by cooled surfaces</b>		

#### Indexing scheme related to adaptation of combustion apparatus to boilers

<b>2103/00</b>	<b>Adaptation of combustion apparatus for placement in or against an opening of a boiler, e.g. for replacing an oil burner</b>
2103/02	. for producing an essentially horizontal flame
<b>2700/00</b>	<b>Combustion apparatus for solid fuel</b>
2700/003	. adapted for use in water-tube boilers