

F23 COMBUSTION APPARATUS; COMBUSTION PROCESSES

F23D BURNERS (generating combustion products of high pressure or high velocity F23R)

BURNERS FOR PULVERULENT FUEL.....	1/00	BURNERS FOR COMBUSTION OF A GAS	14/00
BURNERS FOR COMBUSTION OF A LIQUID		BURNERS FOR COMBUSTION OF GASEOUS OR LIQUID OR PULVERULENT FUEL.....	17/00
Using capillary action.....	3/00	OTHER BURNERS	21/00
Using fuel evaporation; direct spraying action.....	5/00; 11/00	ASSEMBLIES OF TWO OR MORE BURNERS	23/00
Using fuel impingement on a surface	7/00, 9/00		

1/00 Burners for combustion of pulverulent fuel (arrangement or mounting of burners F23C 5/00)	5/14	. . Maintaining predetermined amount of fuel in evaporator
1/02 . Vortex burners, e.g. for cyclone-type combustion apparatus	5/16	. . Safety devices
1/04 . Burners producing cylindrical flames without centrifugal action	5/18	. . Preheating devices
1/06 . Burners producing sheet flames		
Combustion of a liquid		
3/00 Burners using capillary action	7/00 Burners in which drops of liquid fuel impinge on a surface	
3/02 . Wick burners	9/00 Burners in which a stream of liquid fuel impinges intermittently on a hot surface	
3/04 . . with flame spreaders (F23D 3/12 takes precedence)	11/00 Burners using a direct spraying action of liquid droplets or vaporised liquid into the combustion space (spraying in general B05B, B05D)	
3/06 . . Inverted wick burners, e.g. for illumination	11/02 . the combustion space being a chamber substantially at atmospheric pressure	
3/08 . . characterised by shape, construction, or material, of wick	11/04 . the spraying action being obtained by centrifugal action	
3/10 . . Blue-flame burners	11/06 . . using a horizontal shaft	
3/12 . . . with flame spreaders	11/08 . . using a vertical shaft	
3/14 . . . with mixing of air and fuel vapour in a chamber before the flame	11/10 . the spraying being induced by a gaseous medium, e.g. water vapour	
3/16 . . using candles (candles <i>per se</i> C11C)	11/12 . . characterised by the shape or arrangement of the outlets from the nozzle	
3/18 . . Details of wick burners	11/14 . . . with a single outlet, e.g. slit	
3/20 . . . Flame spreaders	11/16 . . in which an emulsion of water and fuel is sprayed	
3/22 . . . Devices for mixing evaporated fuel with air	11/18 . . the gaseous medium being water vapour generated at the nozzle	
3/24 . . . Carriers for wicks	11/20 . . . the water vapour being superheated	
3/26 Safety devices thereon	11/22 . . the gaseous medium being vaporised fuel, e.g. for a soldering lamp	
3/28 . . . Wick-adjusting devices	11/24 . by pressurisation of the fuel before a nozzle through which it is sprayed by a substantial pressure reduction into a space	
3/30 directly engaging with the wick	11/26 . . with provision for varying the rate at which the fuel is sprayed	
3/32 engaging with a tube carrying the wick	11/28 . . . with flow-back of fuel at the burner, e.g. using by-pass	
3/34 Wick stop devices; Wick-fixing devices	11/30 . . . with return feed of uncombusted sprayed fuel to reservoir	
3/36 . . . Devices for trimming wicks	11/32 . by electrostatic means	
3/38 . . . Devices for replacement of wicks	11/34 . by ultrasonic means	
3/40 . the capillary action taking place in one or more rigid porous bodies	11/36 . Details	
5/00 Burners in which liquid fuel evaporates in the combustion space, with or without chemical conversion of evaporated fuel	11/38 . . Nozzles (nozzles in general B05B); Cleaning devices therefor	
5/02 . the liquid forming a pool, e.g. bowl-type evaporators, dish-type evaporators	11/40 . . Mixing tubes; Burner heads	
5/04 . . Pot-type evaporators, i.e. using a partially-enclosed combustion space	11/42 . . Starting devices (igniting F23Q)	
5/06 . the liquid forming a film on one or more plane or convex surfaces		
5/08 . . on cascaded surfaces		
5/10 . . on grids		
5/12 . Details		

F23D

- 11/44 . . Preheating devices; Vaporising devices
- 11/46 . . Devices on the vaporiser for controlling the feeding of the fuel

14/00 Burners for combustion of a gas, e.g. of a gas stored under pressure as a liquid [4]

- 14/02 . Premix gas burners, i.e. in which gaseous fuel is mixed with combustion air upstream of the combustion zone [4]
- 14/04 . . induction type, e.g. Bunsen burner [4]
- 14/06 . . . with radial outlets at the burner head [4]
- 14/08 . . . with axial outlets at the burner head [4]
- 14/10 . . . with elongated tubular burner head [4]
- 14/12 . Radiant burners [4]
- 14/14 . . using screens or perforated plates [4]
- 14/16 . . using permeable blocks [4]
- 14/18 . . using catalysis for flameless combustion [4]
- 14/20 . Non-premix gas burners, i.e. in which gaseous fuel is mixed with combustion air on arrival at the combustion zone (F23D 14/30 F23D 14/44 take precedence) [4]
- 14/22 . . with separate air and gas feed ducts, e.g. with ducts running parallel or crossing each other [4]
- 14/24 . . . at least one of the fluids being submitted to a swirling motion [4]
- 14/26 . with provision for a retention flame (pilot flame igniters F23Q 9/00) [4]
- 14/28 . in association with a gaseous fuel source, e.g. acetylene generator, or a container for liquefied gas [4]
- 14/30 . Inverted burners, e.g. for illumination [4]
- 14/32 . using a mixture of gaseous fuel and pure oxygen or oxygen-enriched air (F23D 14/38 takes precedence) [4]
- 14/34 . Burners specially adapted for use with means for pressurising the gaseous fuel or the combustion air (F23D 14/38 takes precedence) [4]
- 14/36 . . in which the compressor and burner form a single unit [4]
- 14/38 . Torches, e.g. for cutting, brazing, welding or heating (nozzles F23D 14/48) [4]
- 14/40 . . for welding (F23D 14/44 takes precedence) [4]
- 14/42 . . for cutting (F23D 14/44 takes precedence) [4]
- 14/44 . . for use under water [4]
- 14/46 . Details [4]

- 14/48 . . Nozzles (for spraying or coating B05B) [4]
- 14/50 . . . Cleaning devices therefor [4]
- 14/52 . . . for torches; for blow-pipes [4]
- 14/54 for cutting or welding metal [4]
- 14/56 . . . for spreading the flame over an area, e.g. for desurfacing of solid material, for surface hardening, for heating workpieces (scarfing by applying flames B23K 7/00) [4]
- 14/58 . . . characterised by the shape or arrangement of the outlet or outlets from the nozzle, e.g. of annular configuration [4]
- 14/60 . . Devices for simultaneous control of gas and combustion air (regulation of combustion in general F23N) [4]
- 14/62 . . Mixing devices; Mixing tubes [4]
- 14/64 . . . with injectors [4]
- 14/66 . . Preheating the combustion air or gas [4]
- 14/68 . . Treating the combustion air or gas, e.g. by filtering, by moistening (in general B01) [4]
- 14/70 . . Baffles or like flow-disturbing devices [4]
- 14/72 . . Safety devices, e.g. operative in case of failure of gas supply (protection or supervision of pipe-line systems F17D 5/00) [4]
- 14/74 . . . Preventing flame lift-off (F23D 14/70 takes precedence) [4]
- 14/76 . . . Protecting flame and burner parts [4]
- 14/78 . . . Cooling burner parts [4]
- 14/80 . . . Selection of a non-toxic gas [4]
- 14/82 . . . Preventing flashback or blowback (F23D 14/70 takes precedence; in gas feed lines A62C 4/02) [4]
- 14/84 . . Flame spreading or otherwise shaping (F23D 14/70 takes precedence) [4]

Other burners

17/00 Burners for combustion simultaneously or alternately of gaseous or liquid or pulverulent fuel

21/00 Burners not otherwise provided for

23/00 Assemblies of two or more burners (gas burners with provision for a retention flame F23D 14/26; arrangement or mounting of burners F23C 5/00; for industrial furnaces F27)