SECTION F — MECHANICAL ENGINEERING; LIGHTING; HEATING; WEAPONS; BLASTING

F23 COMBUSTION APPARATUS; COMBUSTION PROCESSES

F23D BURNERS

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1/00 Burners for combustion of pulverulent fuel [1, 2006.01]

1/02 • Vortex burners, e.g. for cyclone-type combustion apparatus **[1, 2006.01]**
1/04 • Burners producing cylindrical flames without centrifugal action **[1, 2006.01]**
1/06 • Burners producing sheet flames **[1, 2006.01]**

Combustion of a liquid

3/00 Burners using capillary action [1, 2006.01]
3/02 • Wick burners **[1, 2006.01]**
3/04 • • with flame spreaders (F23D 3/12 takes precedence) **[1, 2006.01]**
3/06 • • Inverted wick burners, e.g. for illumination **[1, 2006.01]**
3/08 • • characterised by shape, construction, or material, of wick **[1, 2006.01]**
3/10 • • Blue-flame burners **[1, 2006.01]**
3/12 • • • with flame spreaders **[1, 2006.01]**
3/14 • • • with mixing of air and fuel vapour in a chamber before the flame **[1, 2006.01]**
3/16 • • using candles **[1, 2006.01]**
3/18 • • Details of wick burners **[1, 2006.01]**
3/20 • • • Flame spreaders **[1, 2006.01]**
3/22 • • • Devices for mixing evaporated fuel with air **[1, 2006.01]**
3/24 • • • Carriers for wicks **[1, 2006.01]**
3/26 • • • • Safety devices thereon **[1, 2006.01]**
3/28 • • • Wick-adjusting devices **[1, 2006.01]**
3/30 • • • • directly engaging with the wick **[1, 2006.01]**
3/32 • • • • engaging with a tube carrying the wick **[1, 2006.01]**
3/34 • • • • Wick stop devices; Wick-fixing devices **[1, 2006.01]**
3/36 • • • Devices for trimming wicks **[1, 2006.01]**
3/38 • • • Devices for replacement of wicks **[1, 2006.01]**
3/40 • the capillary action taking place in one or more rigid porous bodies **[1, 2006.01]**

5/00 Burners in which liquid fuel evaporates in the combustion space, with or without chemical conversion of evaporated fuel [1, 2006.01]
5/02 • the liquid forming a pool, e.g. bowl-type evaporators, dish-type evaporators **[1, 2006.01]**
5/04 • • Pot-type evaporators, i.e. using a partially-enclosed combustion space **[1, 2006.01]**
5/06 • the liquid forming a film on one or more plane or convex surfaces **[1, 2006.01]**
5/08 • • on cascaded surfaces **[1, 2006.01]**
5/10 • • on grids **[1, 2006.01]**
5/12 • Details **[1, 2006.01]**
5/14 • • Maintaining predetermined amount of fuel in evaporator **[1, 2006.01]**
5/16 • • Safety devices **[1, 2006.01]**
5/18 • • Preheating devices **[1, 2006.01]**

7/00 Burners in which drops of liquid fuel impinge on a surface [1, 2006.01]

9/00 Burners in which a stream of liquid fuel impinges intermittently on a hot surface [1, 2006.01]

11/00 Burners using a direct spraying action of liquid droplets or vaporised liquid into the combustion space [1, 2006.01]
11/02 • the combustion space being a chamber substantially at atmospheric pressure **[1, 2006.01]**
11/04 • the spraying action being obtained by centrifugal action **[1, 2006.01]**
11/06 • • using a horizontal shaft **[1, 2006.01]**
11/08 • • using a vertical shaft **[1, 2006.01]**
11/10 • the spraying being induced by a gaseous medium, e.g. water vapour **[1, 2006.01]**

11/12 • • characterised by the shape or arrangement of the outlets from the nozzle **[1, 2006.01]**
11/14 • • • with a single outlet, e.g. slit **[1, 2006.01]**
11/16 • • in which an emulsion of water and fuel is sprayed **[1, 2006.01]**
11/18 • • the gaseous medium being water vapour generated at the nozzle **[1, 2006.01]**
11/20 • • • the water vapour being superheated **[1, 2006.01]**
11/22 • • the gaseous medium being vaporised fuel, e.g. for a soldering lamp **[1, 2006.01]**
11/24 • by pressurisation of the fuel before a nozzle through which it is sprayed by a substantial pressure reduction into a space **[1, 2006.01]**
11/26 • • with provision for varying the rate at which the fuel is sprayed **[1, 2006.01]**
11/28 • • • with flow-back of fuel at the burner, e.g. using by-pass **[1, 2006.01]**
11/30 • • • with return feed of uncombusted sprayed fuel to reservoir **[1, 2006.01]**
11/32 • by electrostatic means **[1, 2006.01]**
11/34 • by ultrasonic means **[1, 2006.01]**
11/36 • Details **[1, 2006.01]**
11/38 • • Nozzles; Cleaning devices therefor **[1, 2006.01]**
11/40 • • Mixing tubes; Burner heads **[1, 2006.01]**
11/42 • • Starting devices (igniting F23Q) **[1, 2006.01]**
11/44 • • Preheating devices; Vaporising devices **[1, 2006.01]**
11/46 • • Devices on the vaporiser for controlling the feeding of the fuel **[1, 2006.01]**

14/00 Burners for combustion of a gas, e.g. of a gas stored under pressure as a liquid [4, 2006.01]

14/02 • Premix gas burners, i.e. in which gaseous fuel is mixed with combustion air upstream of the combustion zone **[4, 2006.01]**
14/04 • • induction type, e.g. Bunsen burner **[4, 2006.01]**
14/06 • • • with radial outlets at the burner head **[4, 2006.01]**
14/08 • • • with axial outlets at the burner head **[4, 2006.01]**
14/10 • • • with elongated tubular burner head **[4, 2006.01]**
14/12 • Radiant burners **[4, 2006.01]**
14/14 • • using screens or perforated plates **[4, 2006.01]**
14/16 • • using permeable blocks **[4, 2006.01]**
14/18 • • using catalysis for flameless combustion **[4, 2006.01]**
14/20 • Non-premix gas burners, i.e. in which gaseous fuel is mixed with combustion air on arrival at the combustion zone (F23D 14/38 takes precedence) **[4, 2006.01]**
14/22 • • with separate air and gas feed ducts, e.g. with ducts running parallel or crossing each other **[4, 2006.01]**
14/24 • • • at least one of the fluids being submitted to a swirling motion **[4, 2006.01]**
14/26 • with provision for a retention flame (pilot flame igniters F23Q 9/00) **[4, 2006.01]**
14/28 • in association with a gaseous fuel source, e.g. acetylene generator, or a container for liquefied gas **[4, 2006.01]**
14/30 • Inverted burners, e.g. for illumination **[4, 2006.01]**
14/32 • using a mixture of gaseous fuel and pure oxygen or oxygen-enriched air (F23D 14/38 takes precedence) **[4, 2006.01]**
14/34 • Burners specially adapted for use with means for pressurising the gaseous fuel or the combustion air **[4, 2006.01]**
14/36 • • in which the compressor and burner form a single unit **[4, 2006.01]**
14/38 • Torches, e.g. for brazing or heating (nozzles F23D 14/48) **[4, 2006.01]**
14/40 • • for welding (F23D 14/44 takes precedence) **[4, 2006.01]**
14/42 • • for cutting (F23D 14/44 takes precedence) **[4, 2006.01]**
14/44 • • for use under water **[4, 2006.01]**
14/46 • Details **[4, 2006.01]**
14/48 • • Nozzles **[4, 2006.01]**
14/50 • • • Cleaning devices therefor **[4, 2006.01]**
14/52 • • • for torches; for blow-pipes **[4, 2006.01]**
14/54 • • • • for cutting or welding metal **[4, 2006.01]**
14/56 • • • for spreading the flame over an area, e.g. for desurfacing of solid material, for surface hardening or for heating workpieces **[4, 2006.01]**
14/58 • • • characterised by the shape or arrangement of the outlet or outlets from the nozzle, e.g. of annular configuration **[4, 2006.01]**
14/60 • • Devices for simultaneous control of gas and combustion air **[4, 2006.01]**
14/62 • • Mixing devices; Mixing tubes **[4, 2006.01]**
14/64 • • • with injectors **[4, 2006.01]**
14/66 • • Preheating the combustion air or gas **[4, 2006.01]**
14/68 • • Treating the combustion air or gas, e.g. by filtering or moistening **[4, 2006.01]**
14/70 • • Baffles or like flow-disturbing devices **[4, 2006.01]**
14/72 • • Safety devices, e.g. operative in case of failure of gas supply **[4, 2006.01]**
14/74 • • • Preventing flame lift-off **[4, 2006.01]**
14/76 • • • Protecting flame and burner parts **[4, 2006.01]**
14/78 • • • Cooling burner parts **[4, 2006.01]**
14/80 • • • Selection of a non-toxic gas **[4, 2006.01]**
14/82 • • • Preventing flashback or blowback **[4, 2006.01]**
14/84 • • Flame spreading or otherwise shaping (F23D 14/70 takes precedence) **[4, 2006.01]**

<u>Other burners</u>

17/00 Burners for combustion simultaneously or alternately of gaseous or liquid or pulverulent fuel [1, 2006.01]

23/00 Assemblies of two or more burners (gas burners with provision for a retention flame F23D 14/26) **[1, 2006.01]**

99/00 Subject matter not provided for in other groups of this subclass [2010.01]