

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

F23 COMBUSTION APPARATUS; COMBUSTION PROCESSES

F23C METHODS OR APPARATUS FOR COMBUSTION USING FLUENT FUEL (burners F23D)

Note(s) [2006.01]

In this subclass, methods are classified in the groups that cover the apparatus used.

Subclass index

COMBUSTION APPARATUS SPECIALLY ADAPTED FOR COMBUSTION OF TWO OR MORE

TYPES OF FUEL.....1/00

COMBINATIONS OF TWO OR MORE COMBUSTION CHAMBERS.....6/00

FUNCTIONAL TYPES OF COMBUSTION APPARATUS

Fluidised bed combustion.....10/00

Catalytic combustion.....13/00

Resonant combustion.....15/00

COMBUSTION APPARATUS CHARACTERISED BY SUBSYSTEMS

Combustion chambers.....3/00

Arrangement or mounting of burners.....5/00

Air supply.....7/00

Arrangements for returning flue gases or combustion products.....9/00

SUBJECT MATTER NOT PROVIDED FOR IN OTHER GROUPS OF THIS SUBCLASS.....99/00

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|------|--|------|--|
| 1/00 | Combustion apparatus specially adapted for combustion of two or more kinds of fuel simultaneously or alternately, at least one kind of fuel being fluent (combustion apparatus characterised by the combination of two or more combustion chambers F23C 6/00; pilot flame igniters F23Q 9/00) [1, 7, 2006.01] | 5/32 | <ul style="list-style-type: none"> • • to obtain rotating flames, i.e. flames moving helically or spirally [3] |
| 1/02 | <ul style="list-style-type: none"> • lump and liquid fuel | 6/00 | Combustion apparatus characterised by the combination of two or more combustion chambers [3, 7, 2006.01] |
| 1/04 | <ul style="list-style-type: none"> • lump and gaseous fuel | 6/02 | <ul style="list-style-type: none"> • in parallel arrangement [3] |
| 1/06 | <ul style="list-style-type: none"> • lump and pulverulent fuel | 6/04 | <ul style="list-style-type: none"> • in series connection [3] |
| 1/08 | <ul style="list-style-type: none"> • liquid and gaseous fuel | 7/00 | Combustion apparatus characterised by arrangements for air supply (inlets for fluidisation air F23C 10/20) [1, 7, 2006.01] |
| 1/10 | <ul style="list-style-type: none"> • liquid and pulverulent fuel | 7/02 | <ul style="list-style-type: none"> • Disposition of air supply not passing through burner |
| 1/12 | <ul style="list-style-type: none"> • gaseous and pulverulent fuel | 7/04 | <ul style="list-style-type: none"> • • to obtain maximum heat transfer to wall of combustion chamber |
| 3/00 | Combustion apparatus characterised by the shape of the combustion chamber (F23C 15/00 takes precedence) [1, 7, 2006.01] | 7/06 | <ul style="list-style-type: none"> • • for heating the incoming air (arrangements of regenerators or recuperators F23L 15/00) |
| 5/00 | Combustion apparatus characterised by the arrangement or mounting of burners [1, 7, 2006.01] | 7/08 | <ul style="list-style-type: none"> • • • indirectly by a secondary fluid other than the combustion products |
| 5/02 | <ul style="list-style-type: none"> • Structural details of mounting | 9/00 | Combustion apparatus characterised by arrangements for returning combustion products or flue gases to the combustion chamber (fluidised bed combustion apparatus with means for recirculation of particles entrained from the bed F23C 10/02; fluidised bed combustion apparatus with devices for removal and partial reintroduction of material from the bed F23C 10/26) [1, 7, 2006.01] |
| 5/06 | <ul style="list-style-type: none"> • • Provision for adjustment of burner position during operation | 9/06 | <ul style="list-style-type: none"> • for completing combustion [3] |
| 5/08 | <ul style="list-style-type: none"> • Disposition of burners | 9/08 | <ul style="list-style-type: none"> • for reducing temperature in combustion chamber, e.g. for protecting walls of combustion chamber [3] |
| 5/14 | <ul style="list-style-type: none"> • • to obtain a single flame of concentrated or substantially planar form, e.g. pencil or sheet flame (F23C 5/32 takes precedence) [3] | | |
| 5/24 | <ul style="list-style-type: none"> • • to obtain a loop flame | | |
| 5/28 | <ul style="list-style-type: none"> • • to obtain flames in opposing directions, e.g. impacting flames | | |

10/00 Apparatus in which combustion takes place in a fluidised bed of fuel or other particles [7]**Note(s)**

In this group, it is desirable to add the indexing code of group F23C 101/00.

- 10/01 • in a fluidised bed of catalytic particles **[2006.01]**
- 10/02 • with means specially adapted for achieving or promoting a circulating movement of particles within the bed or for a recirculation of particles entrained from the bed **[7]**
- 10/04 • • the particles being circulated to a section, e.g. a heat-exchange section or a return duct, at least partially shielded from the combustion zone, before being reintroduced into the combustion zone **[7]**
- 10/06 • • • the circulating movement being promoted by inducing differing degrees of fluidisation in different parts of the bed **[7]**
- 10/08 • • • characterised by the arrangement of separation apparatus, e.g. cyclones, for separating particles from the flue gases **[7]**
- 10/10 • • • • the separation apparatus being located outside the combustion chamber **[7]**
- 10/12 • • the particles being circulated exclusively within the combustion zone **[7]**
- 10/14 • • • the circulating movement being promoted by inducing differing degrees of fluidisation in different parts of the bed **[7]**
- 10/16 • specially adapted for operation at superatmospheric pressures, e.g. by the arrangement of the combustion chamber and its auxiliary systems inside a pressure vessel **[7]**
- 10/18 • Details; Accessories **[7]**
- 10/20 • • Inlets for fluidisation air, e.g. grids; Bottoms **[7]**
- 10/22 • • Fuel feeders specially adapted for fluidised bed combustion apparatus (F23C 10/26 takes precedence) **[7]**

- 10/24 • • Devices for removal of material from the bed (devices for controlling the level of the bed or the amount of material in the bed F23C 10/30) **[7]**
- 10/26 • • • combined with devices for partial reintroduction of material into the bed, e.g. after separation of agglomerated parts **[7]**
- 10/28 • • Control devices specially adapted for fluidised bed combustion apparatus **[7]**
- 10/30 • • • for controlling the level of the bed or the amount of material in the bed **[7]**
- 10/32 • • • • by controlling the rate of recirculation of particles separated from the flue gases **[7]**

13/00 Apparatus in which combustion takes place in the presence of catalytic material (in a fluidised bed of catalytic particles F23C 10/01; radiant gas burners using catalysis for flameless combustion F23D 14/18) **[2006.01]**

- 13/02 • characterised by arrangements for starting the operation, e.g. for heating the catalytic material to operating temperature **[2006.01]**
- 13/04 • characterised by the arrangement of two or more catalytic elements in series connection **[2006.01]**
- 13/06 • in which non-catalytic combustion takes place in addition to catalytic combustion, e.g. downstream of a catalytic element **[2006.01]**
- 13/08 • characterised by the catalytic material **[2006.01]**

15/00 Apparatus in which combustion takes place in pulses influenced by acoustic resonance in a gas mass [2006.01]**99/00 Subject matter not provided for in other groups of this subclass [2006.01]****Indexing scheme associated with group F23C 10/00, relating to combustion in entrained fluidised beds. [7]****101/00 Combustion in entrained fluidised beds, i.e. fluidised beds which have no distinct upper surface [7]**