CPC  COOPERATIVE PATENT CLASSIFICATION

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

LIGHTING; HEATING

F23  COMBUSTION APPARATUS; COMBUSTION PROCESSES
    (NOTE omitted)

F23C  METHODS OR APPARATUS FOR COMBUSTION USING FLUID FUEL OR SOLID FUEL SUSPENDED IN \{A CARRIER GAS OR\} AIR  (burners F23D)

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

WARNINGS
1. The following IPC groups are not in the CPC scheme. The subject matter for these IPC groups is classified in the following CPC groups:
   F23C 101/00  covered by
2. 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.

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 either a fluid fuel or a solid fuel suspended in \{a carrier gas or\} air  (combustion apparatus characterized by the combination of two or more combustion chambers F23C 6/00; pilot flame igniters F23Q 9/00)
   1/02  . lump and liquid fuel
   1/04  . lump and gaseous fuel
   1/06  . lump and pulverulent fuel
   1/08  . liquid and gaseous fuel
   1/10  . liquid and pulverulent fuel
   1/12  . gaseous and pulverulent fuel
3/00  Combustion apparatus characterised by the shape of the combustion chamber
   3/002  . (the chamber having an elongated tubular form, e.g. for a radiant tube)
   3/004  . (the chamber being arranged for submerged combustion  (F23C 3/002 takes precedence))
   3/006  . (the chamber being arranged for cyclonic combustion (for waste F23G 5/32))
   3/008  . . . (for pulverulent fuel)
5/00  Disposition of burners with respect to the combustion chamber or to one another; Mounting of burners in combustion apparatus  (F23C 1/00, F23C 15/00 take precedence)
   5/02  . Structural details of mounting
   5/06  . Provision for adjustment of burner position during operation
   5/08  . Disposition of burners
   5/10  . . . (to obtain a flame ring)
   5/12  . . . (for pulverulent fuel)
   5/14  . . . to obtain a single flame of concentrated or substantially planar form, e.g. pencil or sheet flame  (F23C 5/32 takes precedence)
Fluidised bed combustion apparatus characterised by arrangements for returning combustion products or flue gases to the combustion chamber
(F23C 10/02; fluidised bed combustion apparatus with devices for removal and partial reintroduction of material from the bed F23C 10/26)

10/06  . . . . . . (for pulverulent solid fuel (F23C 10/005 - F23C 10/32 take precedence))
10/07  . . . . . . (comprising two or more beds)
10/10  . . . . . . (comprising a rotating bed)
10/12  . . . . . . in a fluidised bed of catalytic particles
10/14  . . . . . . 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
10/16  . . . . . . 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
10/18  . . . . . . the circulating movement being promoted by inducing differing degrees of fluidisation in different parts of the bed
10/20  . . . . . . characterised by the arrangement of separation apparatus, e.g. cyclones, for separating particles from the flue gases
10/22  . . . . . . the separation apparatus being located outside the combustion chamber
10/24  . . . . . . the particles being circulated exclusively within the combustion zone
10/26  . . . . . . the circulating movement being promoted by inducing differing degrees of fluidisation in different parts of the bed
10/28  . . . . . . specially adapted for operation at superatmospheric pressures, e.g. by the arrangement of the combustion chamber and its auxiliary systems inside a pressure vessel
10/30  . . . . . . Details: Accessories
10/32  . . . . . . Inlets for fluidisation air, e.g. grids; Bottoms
10/34  . . . . . . Fuel feeders specially adapted for fluidised bed combustion apparatus (F23C 10/26 takes precedence)
10/36  . . . . . . 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)
10/38  . . . . . . combined with devices for partial reintroduction of material into the bed, e.g. after separation of agglomerated parts
10/40  . . . . . . Control devices specially adapted for fluidised bed, combustion apparatus
10/42  . . . . . . for controlling the level of the bed or the amount of material in the bed
10/44  . . . . . . by controlling the rate of recirculation of particles separated from the flue gases
therefore fuels suspended in air; Combustion processes using fluent fuel

Special arrangements for combustion apparatus using fluent fuel

Combustion apparatus using liquid fuel
without pre-vaporising means
with pre-vaporising means
Combustion apparatus using gaseous fuel
for surface combustion
generating heat by heating radiant bodies
Combustion apparatus using pulverized fuel
Arrangements for igniting, flame-guiding, air supply in
Other special arrangements

Special features of, or arrangements for combustion apparatus using fluid fuels or solid fuels suspended in air; Combustion processes therefore

Co-combustion of biomass with coal
Miniaturized combustion devices using fluid fuels
Combustion apparatus adapted for incorporating a fuel reforming device
Annular combustion chambers (for gas turbines F23R 3/50)
Tubular combustion chambers with swirling fuel/air flow
Burners with an internal combustion chamber, e.g. for obtaining an increased heat release, a high speed jet flame or being used for starting the combustion
Reverse flow combustion chambers
Sealed combustion chambers with balanced flue
Spherical or bulb-shaped combustion chambers
Elongated tube-shaped combustion chambers
Disposition of burners relative to each other creating specific heat patterns
Disposition of radial jet burners in relation to an impingement surface, e.g. a heat transfer surface, to obtain flame re-attachment combustion
Staged supply of oxidant
Annular arrangement of burners in a furnace, e.g. in a gas turbine, operated in alternate lean-rich mode
Burner staging, i.e. radially stratified flame core burners
Air swirling vanes incorporating fuel injectors
Premix burners with air inlet slots obtained between offset curved wall surfaces, e.g. double cone burners
Details of lances
Delivering secondary air introduction into the flame by using a shield or gas curtain
Cooling flue gas before returning them to flame or combustion chamber