CPC COOPERATIVE PATENT CLASSIFICATION

F23N REGULATING OR CONTROLLING COMBUSTION (control devices specially adapted for fluidised-bed combustion apparatus F23C 10/28 ; condition reponsive controls for regulating combustion in domestic stoves with open fires for solid fuel F24B 1/187)

F23N 1/00 Regulating fuel supply

F23N 1/002 . { using electronic means (F23N 1/04 to F23N 1/10 take precedence) }

F23N 1/005 . { using electrical or electromechanical means (F23N 1/04 to F23N 1/10 take precedence) }

F23N 1/007 . { using mechanical means (F23N 1/04 to F23N 1/10 take precedence) }

F23N 1/02 . conjointly with air supply

F23N 1/022 . . { using electronic means }

F23N 1/025 . . { using electrical or electromechanical means }

F23N 1/027 . . { using mechanical means }

F23N 1/04 . conjointly with air supply and with draught

F23N 1/042 . . { using electronic means }

F23N 1/045 . . { using electrical or electromechanical means }

F23N 1/047 . . { using mechanical means }

F23N 1/06 . conjointly with draught

F23N 1/062 . . { using electronic means }

F23N 1/065 . . { using electrical or electromechanical means }

F23N 1/067 . . { using mechanical means }

F23N 1/08 . conjointly with another medium, e.g. boiler water

F23N 1/082 . . { using electronic means }

F23N 1/085 . . { using electrical or electromechanical means }

F23N 1/087 . . { using mechanical means }

F23N 1/10 . . and with air supply or draught

F23N 1/102 . . . { using electronic means }

F23N 1/105 . . . { using electrical or electromechanical means }

F23N 1/107 . . . { using mechanical means }

F23N 3/00 Regulating air supply or draught (conjointly with fuel supply F23N 1/00)

F23N 3/002 . { using electronic means (F23N 3/02 to F23N 3/08 take precedence) }

F23N 3/005 . { using electrical or electromechanical means (F23N 3/02 to F23N 3/08 take precedence) }

F23N 3/007 . { using mechanical means (F23N 3/02 to F23N 3/08 take precedence) }

F23N 3/02 . Regulating draught by direct pressure operation of single valves or dampers

F23N 3/04 . by operation of single valves or dampers by temperature sensitive elements
F23N 3/042 . . { using electronic means }
F23N 3/045 . . { using electrical or electromechanical means }
F23N 3/047 . . { using mechanical means }

F23N 3/06 . by conjoint operation of two or more valves or dampers (F23N 3/08 takes precedence)
F23N 3/065 . . { using mechanical means }

F23N 3/08 . by power-assisted systems
F23N 3/082 . . { using electronic means }
F23N 3/085 . . { using electrical or electromechanical means }
F23N 3/087 . . { using mechanical means }

F23N 5/00 **Systems for controlling combustion** (F23N 1/00 , F23N 3/00 take precedence)

F23N 5/003 . { using detectors sensitive to combustion gas properties (F23N 5/02 , F23N 5/18 to F23N 5/26 take precedence) }
F23N 5/006 . . { the detector being sensitive to oxygen }

F23N 5/02 . using devices responsive to thermal changes or to thermal expansion of a medium
F23N 5/022 . . { using electronic means (F23N 5/04 to F23N 5/14 take precedence) }
F23N 5/025 . . { using electrical or electromechanical means (F23N 5/04 to F23N 5/14 take precedence) }
F23N 5/027 . . { using mechanical means (F23N 5/04 to F23N 5/14 take precedence) }
F23N 5/04 . . using bimetallic elements
F23N 5/042 . . . { using electronic means }
F23N 5/045 . . . { using electrical or electromechanical means }
F23N 5/047 . . . { using mechanical means }
F23N 5/06 . . using bellows ; using diaphragms
F23N 5/062 . . . { using electronic means }
F23N 5/065 . . . { using electrical or electromechanical means }
F23N 5/067 . . . { using mechanical means }
F23N 5/08 . . using light-sensitive elements
F23N 5/082 . . . { using electronic means }
F23N 5/085 . . . { using electrical or electromechanical means }
F23N 5/087 . . . { using mechanical means }
F23N 5/10 . . using thermocouples
F23N 5/102 . . . { using electronic means }
F23N 5/105 . . . { using electrical or electromechanical means }

F23N 5/107 . . . { using mechanical means e.g. safety valves }

F23N 5/12 . . using ionisation-sensitive elements, i.e. flame rods { (testing of other ignition means, e.g. flame F02P 17/12 ; analysing gases by investigating the ionisation by using heat G01N 27/626) }

F23N 5/123 . . . { using electronic means }

F23N 5/126 . . . { using electrical or electromechanical means }

F23N 5/14 . . using thermo-sensitive resistors

F23N 5/143 . . . { using electronic means }

F23N 5/146 . . . { using electrical or electromechanical means }

F23N 5/16 . using noise-sensitive detectors

F23N 2005/165 . . with ultrasonic means

F23N 5/18 . using detectors sensitive to rate of flow of air or fuel

F23N 2005/181 . . using detectors sensitive to rate of flow of air

F23N 2005/182 . . . Air flow switch

F23N 5/184 . . { using electronic means }

F23N 2005/185 . . using detectors sensitive to rate of flow of fuel

F23N 5/187 . . { using electrical or electromechanical means }

F23N 5/188 . . { using mechanical means }

F23N 5/20 . with a time programme acting through electrical means, e.g. using time-delay relays

F23N 5/203 . . { using electronic means }

F23N 5/206 . . { using electrical or electromechanical means }

F23N 5/22 . with a time programme acting through mechanical means, e.g. using cams

F23N 5/24 . Preventing development of abnormal or undesired conditions, i.e. safety arrangements (F23N 5/02 to F23N 5/18 take precedence)

F23N 5/242 . . { using electronic means }

F23N 5/245 . . { using electrical or electromechanical means }

F23N 5/247 . . { using mechanical means }

F23N 5/26 . Details

F23N 5/265 . . { using electronic means }

F23N 2021/00 Pretreatment or prehandling

F23N 2021/02 . using belt conveyers

F23N 2021/04 . Preheating liquid fuel

F23N 2021/06 . Preheating gaseous fuel

F23N 2021/08 . Preheating the air

F23N 2021/10 . Analysing fuel properties, e.g. density, calorific

F23N 2021/12 . Recycling exhaust gases

F23N 2023/00 Signal processing ; Details thereof

F23N 2023/02 . Multiplex transmission

F23N 2023/04 . Memory

F23N 2023/06 . Sampling

F23N 2023/08 . Microprocessor ; Microcomputer

F23N 2023/10 . Correlation

F23N 2023/12 . Integration

F23N 2023/14 . Differentiation

F23N 2023/16 . Measuring bridge

F23N 2023/18 . Chopper

F23N 2023/20 . Opto-coupler

F23N 2023/22 . Timing network
F23N 2023/24 . . with bimetallic elements
F23N 2023/26 . . with capacitors
F23N 2023/28 . . with more than one timing element

F23N 2023/30 . Switches
F23N 2023/32 . . Reed switches

F23N 2023/34 . with feedforward processing

F23N 2023/36 . PID signal processing

F23N 2023/38 . Remote control

F23N 2023/40 . Simulation

F23N 2023/42 . Function generator

F23N 2023/44 . Optimum control

F23N 2023/46 . Identification

F23N 2023/48 . Learning / Adaptive control

F23N 2023/50 . Human control

F23N 2023/52 . Fuzzy logic

F23N 2023/54 . Recording

F23N 2025/00 Measuring

F23N 2025/02 . filling height in burners

F23N 2025/04 . pressure
F23N 2025/06 . . for determining flow

F23N 2025/08 . temperature
F23N 2025/10 . . stack temperature
F23N 2025/12 . . room temperature
F23N 2025/13 . . outdoor temperature
F23N 2025/14 . . Ambient temperature around burners
F23N 2025/16 . . burner temperature
F23N 2025/18 . . feedwater temperature
F23N 2025/19 . . outlet temperature water heat-exchanger
F23N 2025/20 . . entrant temperature
F23N 2025/21 . . outlet temperature

F23N 2025/22 . heat losses
F23N 2025/24 . . indicated in an amount of money

F23N 2025/26 . humidity
F23N 2025/30 . . measuring lambda

F23N 2027/00 Ingnition or checking

F23N 2027/02 . Starting or ignition cycles

F23N 2027/04 . Prepurge

F23N 2027/06 . Postpurge

F23N 2027/08 . Hold fire apparatus

F23N 2027/10 . Sequential burner running

F23N 2027/12 . Burner simulation or checking
F23N 2027/14 . . Flame simulation
F23N 2027/16 . . Checking components, e.g. electronic

F23N 2027/18 . Applying test signals, e.g. periodic

F23N 2027/20 . Calibrating devices

F23N 2027/22 . Pilot burners (ignition circuits therefor F23N 2027/32)
F23N 2027/24 . . the pilot burner not burning continuously
F23N 2027/26 . . comprising two or more distinct pilot burners

F23N 2027/28 . Ignition circuits
F23N 2027/30 . . for pilot burners

F23N 2027/32 . Igniting for a predetermined number of cycles

F23N 2027/34 . Continuously applied ignition cycles

F23N 2027/36 . Spark ignition, e.g. by means of a high voltage

F23N 2027/38 . Electrical resistance ignition

F23N 2027/40 . Catalytic ignition

F23N 2027/42 . Ceramic glow ignition

F23N 2029/00 Flame sensors

F23N 2029/02 . Pilot flame sensors

F23N 2029/04 . sensitive to the colour of flames

F23N 2029/06 . with periodical shutters ; Modulation signals

F23N 2029/08 . detecting flame flicker

F23N 2029/10 . comprising application of periodical fuel flow fluctuations

F23N 2029/12 . with flame rectification current detecting means

F23N 2029/14 . using two or more different types of flame sensor

F23N 2029/16 . using two or more of the same types of flame sensor

F23N 2029/18 . Flame sensor cooling means

F23N 2029/20 . Camera viewing

F23N 2029/22 . the sensor`s sensivity being variable

F23N 2031/00 Fail safe

F23N 2031/02 . using electric energy accumulators

F23N 2031/04 . for electrical power failures

F23N 2031/06 . for flame failures

F23N 2031/08 . . for pilot flame failures

F23N 2031/10 . for component failures

F23N 2031/12 . for ignition failures

F23N 2031/14 . for earthquakes

F23N 2031/16 . using melting materials or shape memory alloys

F23N 2031/18 . Detecting fluid leaks

F23N 2031/20 . Warning devices
F23N 2031/22 . . using warning lamps

F23N 2031/24 . Freezing

F23N 2031/26 . for clogging air inlet

F23N 2031/28 . preventing flash-back or blow-back

F23N 2031/30 . Representation of working time

F23N 2033/00 Ventilators

F23N 2033/02 . in stacks
F23N 2033/04 . . with variable speed

F23N 2033/06 . at the air intake
F23N 2033/08 . . with variable speed

F23N 2033/10 . forcing air through heat exchangers

F23N 2035/00 Valves, nozzles or pumps

F23N 2035/02 . Air or combustion gas valves or dampers
F23N 2035/04 . . in stacks
F23N 2035/06 . . at the air intake
F23N 2035/08 . . used with heat exchanges
F23N 2035/10 . . power assisted, e.g. using electric motors

F23N 2035/12 . Fuel valves
F23N 2035/14 . . electromagnetically operated
F23N 2035/16 . . variable flow or proportional valves
F23N 2035/18 . . Groups of two or more valves
F23N 2035/20 . . Membrane valves
F23N 2035/22 . . cooperating with magnets

F23N 2035/24 . . Valve details

F23N 2035/26 . Fuel nozzles
F23N 2035/28 . . Spray fuel nozzles

F23N 2035/30 . Pumps

F23N 2037/00 **Controlling** (F23N 5/00 takes precedence)

F23N 2037/02 . two or more burners

F23N 2037/04 . at two or more different localities

F23N 2037/06 . two predeterming temperatures, e.g. day-night

F23N 2037/08 . two or more different types of fuel simultaneously

F23N 2037/10 . High or low fire

F23N 2037/12 . catalytic burners

F23N 2037/14 . burners with gasification or vaporizer elements

F23N 2037/16 . secondary air

F23N 2037/18 . fluidized bed burners

F23N 2037/20 . one or more bypass conduits

F23N 2037/22 . water injection

F23N 2037/24 . height of burner
F23N 2037/26 . . oxygen-air ratio
F23N 2037/28 . . oxygen as pure oxydant
F23N 2037/30 . . matrix burners
F23N 2037/32 . . Nox

F23N 2039/00 **Fuels**

F23N 2039/02 . Solid fuels

F23N 2039/04 . Gaseous fuels

F23N 2039/06 . Liquid fuels

F23N 2041/00 **Applications**

F23N 2041/02 . Space-heating

F23N 2041/04 . Heating water

F23N 2041/06 . Space-heating and heating water

F23N 2041/08 . Household apparatus

F23N 2041/10 . Generating vapour

F23N 2041/11 . Torches

F23N 2041/12 . Stack-torches

F23N 2041/14 . Vehicle heating, the heat being derived otherwise than from the propulsion plant

F23N 2041/16 . Spectrometer burners

F23N 2041/18 . Incinerating apparatus

F23N 2041/20 . Gas turbines

F23N 2041/22 . Absorption refrigerator

F23N 2900/00 Special features of, or arrangements for controlling combustion

F23N 2900/01001 . Micro Electro Mechanical Systems (MEMS) for controlling fuel supply to burners

F23N 2900/01002 . Electromagnetically operated fuel valves with a single solenoid controlling two or more cores

F23N 2900/05001 . Measuring CO content in flue gas

F23N 2900/05002 . Measuring CO2 content in flue gas

F23N 2900/05003 . Measuring NOx content in flue gas

F23N 2900/05004 . Details of components, e.g. connecting adaptors

F23N 2900/05005 . Mounting arrangements for sensing, detecting or measuring devices

F23N 2900/05006 . Controlling systems using neuronal networks

F23N 2900/05101 . Connections between thermocouple and magnetic valves, e.g. by plug and socket connectors

F23N 2900/05181 . Controlling air to fuel ratio by using a single differential pressure detector