CPC COOPERATIVE PATENT CLASSIFICATION

F05B INDEXING SCHEME RELATING TO MACHINES OR ENGINES OTHER THAN NON-POSITIVE-DISPLACEMENT MACHINES OR ENGINES, TO WIND MOTORS, TO NON-POSITIVE DISPLACEMENT PUMPS, AND TO GENERATING COMBUSTION PRODUCTS OF HIGH PRESSURE OR HIGH VELOCITY

NOTE

This subclass constitutes an internal scheme for indexing only.

Guidance heading:

F05B 2200/00 Mathematical features

F05B 2200/10 . Basic functions
F05B 2200/11 . . Sum
F05B 2200/12 . . Substraction
F05B 2200/13 . . Product
F05B 2200/14 . . Division
F05B 2200/15 . . Inverse

F05B 2200/20 . Special functions
F05B 2200/21 . . Root
F05B 2200/211 . . . Square root
F05B 2200/212 . . . Cubic root
F05B 2200/22 . . Power
F05B 2200/221 . . . Square power
F05B 2200/222 . . . Cubic power
F05B 2200/23 . . Logarithm
F05B 2200/24 . . exponential
F05B 2200/25 . . Hyperbolic trigonemetric, e.g. sinh, cosh, tanh
F05B 2200/26 . . trigonometric
F05B 2200/261 . . . Sine
F05B 2200/262 . . . Cosine
F05B 2200/263 . . . Tangent
F05B 2200/264 . . . Cotangent

F05B 2200/30 . miscellaneous
F05B 2200/31 . . odd
F05B 2200/32 . . even
F05B 2200/33 . . bigger/smaller

F05B 2200/34 . . biggest/smallest
F05B 2200/35 . . first
F05B 2200/36 . . last

Guidance heading:

F05B 2210/00 Working fluid

NOTE

Indexing codes of group F05B 2210/00 can be followed by a name for a specific working fluid preceded by the "+" sign, e.g. F05B 2210/11+water.

F05B 2210/10 . Kind or type
F05B 2210/11 . . liquid, i.e. incompressible
F05B 2210/12 . . gaseous, i.e. compressible
F05B 2210/13 . . mixed, e.g. two-phase fluid
F05B 2210/132 . . . Pumps with means for separating and evacuating the gaseous phase
F05B 2210/14 . . Refrigerants with particular properties, e.g. HFC-134a

F05B 2210/16 . Air or water being indistinctly used as working fluid, i.e. the machine can work equally with air or water without any modification

F05B 2210/18 . Air and water being simultaneously used as working fluid

F05B 2210/20 . Properties

F05B 2210/30 . Flow characteristics
F05B 2210/301 . . with Mach-number kept constant along the flow
F05B 2210/302 . . Pressure kept constant along the flow

F05B 2210/40 . Flow geometry or direction
F05B 2210/401 . . upwards due to the buoancy of compressed air
F05B 2210/402 . . Axial inlet and radial outlet
F05B 2210/403 . . Radial inlet and axial outlet
F05B 2210/404 . . bidirectional, i.e. in opposite, alternating directions

F05B 2220/00 Application

F05B 2220/10 . in ram-jet engines or ram-jet driven vehicles

F05B 2220/20 . within closed fluid conduits, e.g. pipes

F05B 2220/25 . as advertisement

F05B 2220/30 . in turbines

F05B 2220/301 .. in steam turbines
F05B 2220/302 .. in gas turbines
F05B 2220/3021 ... for a special turbine stage
F05B 2220/3022 .... the first stage of a turbine
F05B 2220/3023 .... an intermediate stage of the turbine
F05B 2220/3025 .... the last stage of the turbine
F05B 2220/303 ... for aircraft propulsion, e.g. jet engines
F05B 2220/304 ... to drive unshrouded, low solidity propeller
F05B 2220/305 ... to drive unshrouded, high solidity propeller
F05B 2220/306 ... to drive shrouded, low solidity propeller
F05B 2220/307 ... to drive shrouded, high solidity propeller
F05B 2220/308 ... providing direct vertical lift
F05B 2220/309 ... in a helicopter
F05B 2220/31 .. in ram-air turbines ("RATS")
F05B 2220/32 .. in water turbines
F05B 2220/33 .. specially adapted for the fan of turbofan engines

F05B 2220/40 . in turbochargers

F05B 2220/50 . for auxiliary power units (APU's)

F05B 2220/60 . making use of surplus or waste energy
F05B 2220/602 .. with energy recovery turbines
F05B 2220/604 .. for domestic central heating or production of electricity

F05B 2220/61 . for hydrogen and/or oxygen production

F05B 2220/62 . for desalination

F05B 2220/64 . for aeration

F05B 2220/70 . in combination with
F05B 2220/702 .. a steam turbine
F05B 2220/704 .. a gas turbine
F05B 2220/706 .. an electrical generator
F05B 2220/7062 ... of the direct current (D.C.) type
F05B 2220/7064 ... of the alternating current (A.C.) type
F05B 2220/70642 .... of the synchronous type
F05B 2220/70644 .... of the asynchronous type, i.e. induction type
F05B 2220/70646 ..... Double fed induction generators (DFIGs)
F05B 2220/7066 ... via a direct connection, i.e. a gearless transmission
F05B 2220/7068 ... equipped with permanent magnets
F05B 2220/707 ... of the linear type
F05B 2220/708 .. Photoelectric means, i.e. photovoltaic or solar cells
F05B 2220/709 .. Piezoelectric means

F05B 2220/80 . in supersonic vehicles excluding hypersonic vehicles or ram, scram or rocket propulsion

F05B 2220/90 . in vehicles adapted for vertical or short take off and landing (v/stol vehicles) , (gas turbines providing direct vertical lift F05B 2220/308)

F05B 2230/00 Manufacture

NOTE

Manufacture comprises also treatment, assembly or disassembly methods, repairing, handling or the like.

F05B 2230/10 . by removing material
F05B 2230/101 . . by electrochemical methods
F05B 2230/102 . . by spark erosion methods
F05B 2230/103 . . using lasers

F05B 2230/104 . Micromachining

F05B 2230/20 . essentially without removing material
F05B 2230/21 . . by casting
F05B 2230/211 . . . by precision casting, e.g. microfusing or investment casting
F05B 2230/22 . . by sintering
F05B 2230/23 . . by permanently joining parts together
F05B 2230/232 . . . by welding
F05B 2230/233 . . . . Electron beam welding
F05B 2230/234 . . . . Laser welding
F05B 2230/235 . . . . Tig/Mig welding
F05B 2230/236 . . . . Diffusion bonding
F05B 2230/237 . . . . Brazing
F05B 2230/238 . . . . Soldering
F05B 2230/239 . . . . Inertia or friction welding
F05B 2230/24 . . by extrusion
F05B 2230/25 . . by forging
F05B 2230/26 . . by rolling

F05B 2230/30 . with deposition of material
F05B 2230/31 . . Layer deposition
F05B 2230/311 . . . by torch or flame spray
F05B 2230/312 . . . by plasma spray
F05B 2230/313 . . . by physical vapour deposition
F05B 2230/314 . . . by chemical vapour deposition

F05B 2230/40 . Heat treatment

F05B 2230/41 . . Hardening; Annealing

F05B 2230/50 . Building or constructing in particular ways

F05B 2230/502 . . using existing or "off the shelf" parts, e.g. using standardised turbocharger elements

F05B 2230/60 . Assembly methods

F05B 2230/601 . . using limited numbers of standard modules which can be adapted by machining

F05B 2230/604 . . using positioning or alignment devices for aligning or centering, e.g. pins

F05B 2230/606 . . . using maintaining alignment while permitting differential dilatation

F05B 2230/608 . . . for adjusting the position or the alignment, e.g. wedges or excenters

F05B 2230/61 . . using auxiliary equipment for lifting or holding (hoisting on to a stationary structure with provisions on the structure itself F05B 2240/916)

F05B 2230/6102 . . . carried on a floating platform

F05B 2230/70 . Disassembly methods

F05B 2230/80 . Repairing, retrofitting or upgrading methods

F05B 2230/90 . Coating; Surface treatment (manufacture with deposition of material F05B 2220/30)

F05B 2240/00 Components

NOTE

Components are the basic elements of construction.

F05B 2240/10 . Stators

F05B 2240/11 . . Shroud seal segments

F05B 2240/12 . . Fluid guiding means, e.g. vanes

F05B 2240/121 . . . Baffles or ribs

F05B 2240/122 . . . Vortex generators, turbulators, or the like, for mixing (by creating turbulence F05B 2260/222)

F05B 2240/123 . . . Nozzles

F05B 2240/1231 . . . . Plug nozzles

F05B 2240/124 . . . Cascades, i.e. assemblies of similar profiles acting in parallel

F05B 2240/13 . . to collect or cause flow towards or away from turbines

F05B 2240/131 . . . by means of vertical structures, i.e. chimneys

F05B 2240/132 . . . creating a vortex or tornado effect

F05B 2240/133 . . . with a convergent-divergent guiding structure, e.g. a Venturi conduit

F05B 2240/14 . . Casings, housings, nacelles, gondels or the like, protecting or supporting assemblies within

F05B 2240/142 . . . in the form of a standard ISO container

F05B 2240/20 . Rotors

F05B 2240/201 . . using the Magnus-effect

F05B 2240/202 .. with adjustable area of intercepted fluid
F05B 2240/2021 ... by means of telescoping blades
F05B 2240/2022 ... by means of tethering or coning blades
F05B 2240/2023 ... by means of radially reefing blades
F05B 2240/21 .. for wind turbines
F05B 2240/211 ... with vertical axis
F05B 2240/212 .... of the Darrieus type
F05B 2240/213 .... of the Savonieus type
F05B 2240/214 .... of the Musgrove or "H"-type
F05B 2240/215 .... of the panemone or "vehicle ventilator" type
F05B 2240/216 .... of the anemometer type
F05B 2240/217 .... of the crossflow- or "Banki"- or "double action" type
F05B 2240/218 .... with horizontally hinged vanes
F05B 2240/221 ... with horizontal axis
F05B 2240/2211 .... of the multibladed, low speed, e.g. "American farm" type
F05B 2240/2212 .... perpendicular to wind direction
F05B 2240/2213 .... and with the rotor downwind from the yaw pivot axis
F05B 2240/231 ... driven by aerodynamic lift effects
F05B 2240/232 .... driven by drag
F05B 2240/24 .. for turbines
F05B 2240/241 ... of impulse type
F05B 2240/2411 .... Pelton type
F05B 2240/242 ... of reaction type
F05B 2240/243 ... of the Archimedes screw type
F05B 2240/244 ... of the cross-flow, e.g. Banki, Ossberger type
F05B 2240/30 .. Characteristics of rotor blades, i.e. of any element transforming dynamic fluid energy to or from rotational energy and being attached to a rotor
F05B 2240/301 ... Cross-section characteristics
F05B 2240/302 ... Segmented or sectional blades
F05B 2240/31 ... of changeable form or shape
F05B 2240/311 .... flexible or elastic
F05B 2240/312 .... capable of being reefed
F05B 2240/3121 ..... around an axis orthogonal to rotor rotational axis
F05B 2240/313 .... with adjustable flow intercepting area (F05B 2240/312 takes precedence)
F05B 2240/32 ... with roughened surfaces
F05B 2240/33 .. Shrouds which are part of or which are rotating with the rotor
F05B 2240/34 .. with auxiliary or secondary rotors attached to blades of main rotor

F05B 2240/35 . Combustors or associated equipment
F05B 2240/36 .. Fuel vaporizer

F05B 2240/40 . Use of a multiplicity of similar components

F05B 2240/50 . Bearings

F05B 2240/51 .. magnetic
F05B 2240/511 ... with permanent magnets
F05B 2240/515 ... electromagnetic
F05B 2240/52 .. Axial thrust bearings
F05B 2240/53 .. Hydrodynamic or hydrostatic bearings
F05B 2240/54 .. Radial bearings

F05B 2240/57 . Seals
F05B 2240/571 .. Brush seals
F05B 2240/572 .. Leaf seals

F05B 2240/60 . Shafts
F05B 2240/61 .. hollow
F05B 2240/62 .. flexible
F05B 2240/63 .. Glands for admission or removal of fluids from shafts

F05B 2240/70 . Slinger plates or washers

F05B 2240/80 . Platforms for stationary or moving blades
F05B 2240/801 .. cooled platforms

F05B 2240/90 . Mounting on supporting structures or systems
F05B 2240/91 .. on a stationary structure
F05B 2240/911 ... already existing for a prior purpose
F05B 2240/9111 .... which is a chimney
F05B 2240/9112 .... which is a building
F05B 2240/9113 .... which is a roadway, rail track, or the like for recovering energy from moving vehicles
F05B 2240/912 ... on a tower
F05B 2240/9121 .... on a lattice tower
F05B 2240/913 ... on a mast
F05B 2240/914 ... on an inflatable structure
F05B 2240/915 ... which is vertically adjustable
F05B 2240/9151 .... telescopically
F05B 2240/9152 .... by being hinged
F05B 2240/91521 ..... at ground level
F05B 2240/916 ... with provision for hoisting onto the structure
F05B 2240/917 ... attached to cables
F05B 2240/92 .. on an airborne structure
F05B 2240/921 ... kept aloft due to aerodynamic effects
F05B 2240/922 ... kept aloft due to buoyancy effects
F05B 2240/923 ... which is a vehicle
F05B 2240/93 .. on a structure floating on a liquid surface
F05B 2240/931 ... which is a vehicle

F05B 2240/932 . . . which is a catamaran-like structure
F05B 2240/94 . . on a movable wheeled structure
F05B 2240/941 . . . which is a land vehicle
F05B 2240/95 . . offshore
F05B 2240/96 . . as part of a wind farm
F05B 2240/97 . . on a submerged structure
F05B 2240/98 . . which is inflatable

F05B 2240/99 . characterised by colour or colour patterns

F05B 2250/00 Geometry

NOTE

Geometry indicates the shape or form of a component or the configuration or arrangement of components in a machine or in a plant.

F05B 2250/02 . variable

F05B 2250/10 . two-dimensional
F05B 2250/11 . . triangular
F05B 2250/12 . . rectangular
F05B 2250/121 . . . square
F05B 2250/13 . . trapezial
F05B 2250/131 . . . polygonal
F05B 2250/132 . . . hexagonal
F05B 2250/14 . . elliptical
F05B 2250/141 . . . circular
F05B 2250/15 . . spiral
F05B 2250/16 . . parabolic
F05B 2250/17 . . hyperbolic
F05B 2250/18 . . patterned
F05B 2250/181 . . . ridged
F05B 2250/182 . . . crenellated, notched
F05B 2250/183 . . . zigzag
F05B 2250/184 . . . sinusoidal
F05B 2250/19 . . machined; miscellaneous
F05B 2250/191 . . . perforated
F05B 2250/192 . . . beveled
F05B 2250/193 . . . milled

F05B 2250/20 . three-dimensional
F05B 2250/21 . . pyramidal
F05B 2250/22 . . parallelepipedic

F05B 2250/221 . . . cubic
F05B 2250/23 . . prismatic
F05B 2250/231 . . . cylindrical
F05B 2250/232 . . . conical
F05B 2250/24 . . ellipsoidal
F05B 2250/241 . . . spherical
F05B 2250/25 . . helical
F05B 2250/26 . . paraboloidal
F05B 2250/27 . . hyperboloidal
F05B 2250/28 . . patterned
F05B 2250/281 . . . threaded
F05B 2250/282 . . . Cubic pattern
F05B 2250/283 . . . Honeycomb
F05B 2250/29 . . machined; miscellaneous
F05B 2250/291 . . . hollowed
F05B 2250/292 . . . tapered
F05B 2250/293 . . . lathed, e.g. rotation symmetrical

F05B 2250/30 . Arrangement of components
F05B 2250/31 . . according to the direction of their main axis or their axis of rotation
F05B 2250/311 . . . the axes being in line
F05B 2250/312 . . . the axes being parallel to each other
F05B 2250/313 . . . the axes being perpendicular to each other
F05B 2250/314 . . . the axes being inclined in relation to each other
F05B 2250/315 . . . the main axis being substantially vertical
F05B 2250/32 . . according to their shape
F05B 2250/321 . . . asymptotic
F05B 2250/322 . . . tangential
F05B 2250/323 . . . convergent
F05B 2250/324 . . . divergent
F05B 2250/33 . . symmetrical
F05B 2250/34 . . translated
F05B 2250/35 . . rotated
F05B 2250/36 . . in inner-outer relationship, e.g. shaft-bearing arrangements

F05B 2250/40 . Movement of component
F05B 2250/41 . . with one degree of freedom
F05B 2250/411 . . . in rotation
F05B 2250/42 . . with two degrees of freedom
F05B 2250/43 . . with three degrees of freedom

F05B 2250/50 . Inlet or outlet
F05B 2250/501 . . Inlet

F05B 2250/5011 . . . augmenting, i.e. with intercepting fluid flow cross sectional area greater than the rest of the machine behind the inlet

F05B 2250/5012 . . . concentrating only, i.e. with intercepting fluid flow cross sectional area not greater than the rest of the machine behind the inlet

F05B 2250/502 . . Outlet

F05B 2250/503 . . of regenerative pumps

F05B 2250/60 . Structure; Surface texture

F05B 2250/61 . . corrugated

F05B 2250/611 . . . undulated

F05B 2250/62 . . smooth

F05B 2250/621 . . . polished

F05B 2250/70 . Shape

F05B 2250/71 . . curved

F05B 2250/711 . . . convex

F05B 2250/712 . . . concave

F05B 2250/713 . . . inflexed

F05B 2250/72 . . symmetric

F05B 2250/73 . . asymmetric

F05B 2250/80 . Size or power range of the machines

F05B 2250/82 . . Micromachines

F05B 2250/84 . . Nanomachines (Nanotechnology for interacting, sensing or actuating Y01N 8/00)

F05B 2250/86 . . Megamachines

F05B 2260/00 Function

F05B 2260/02 . Transport, e.g. specific adaptations or devices for conveyance (transport of wind turbines or equipments therefore F03D 1/005)

F05B 2260/10 . Particular cycles

F05B 2260/20 . Heat transfer, e.g. cooling

F05B 2260/201 . . by impingement of a fluid

F05B 2260/202 . . by film cooling

F05B 2260/203 . . by transpiration cooling

F05B 2260/205 . . Cooling fluid recirculation, i.e. after having cooled one or more components the cooling fluid is recovered and used elsewhere for other purposes

F05B 2260/207 . . using a phase changing mass, (e.g. heat absorbing by melting or boiling)

F05B 2260/208 . . using heat pipes

F05B 2260/209 . . using vortex tubes

F05B 2260/211 . . by intercooling, e.g. during a compression cycle

F05B 2260/212 . . . by water injection

F05B 2260/221 . . Improvement of heat transfer

F05B 2260/222 . . . by creating turbulence (vortex generators, turbulators or the like for mixing F05B 2240/122)
F05B 2260/224 . . . by increasing the heat transfer surface
F05B 2260/2241 . . . . using fins or ribs
F05B 2260/231 . . Preventing heat transfer
F05B 2260/232 . . characterised by the cooling medium
F05B 2260/233 . . . the medium being steam
F05B 2260/24 . . for draft enhancement in chimneys, using solar or other heat sources

F05B 2260/30 . Retaining components in desired mutual position
F05B 2260/301 . . Retaining bolts or nuts
F05B 2260/3011 . . . of the frangible or shear type
F05B 2260/302 . . by means of magnetic or electromagnetic forces
F05B 2260/303 . . with a bayonet coupling
F05B 2260/304 . . Balancing of radial or axial forces on regenerative rotors
F05B 2260/305 . . Reducing friction between regenerative impeller discs and casing walls

F05B 2260/40 . Transmission of power
F05B 2260/402 . . through friction drives
F05B 2260/4021 . . . through belt drives
F05B 2260/4022 . . . through endless chains
F05B 2260/4023 . . . through a friction clutch
F05B 2260/403 . . through the shape of the drive components
F05B 2260/4031 . . . as in toothed gearing
F05B 2260/40311 . . . . of the epicyclic, planetary or differential type
F05B 2260/404 . . through magnetic drive coupling
F05B 2260/4041 . . . the driven magnets encircling the driver magnets
F05B 2260/406 . . through hydraulic systems
F05B 2260/407 . . through piezoelectric conversion
F05B 2260/408 . . through magnetohydrodynamic conversion

F05B 2260/42 . Storage of energy
F05B 2260/421 . . in the form of rotational kinetic energy , e.g. in flywheels

F05B 2260/50 . Kinematic linkage, i.e. transmission of position
F05B 2260/502 . . involving springs
F05B 2260/503 . . using gears
F05B 2260/5032 . . . of the bevel or angled type
F05B 2260/504 . . using flat or V-belts and pulleys
F05B 2260/505 . . using chains and sprockets; using toothed belts
F05B 2260/506 . . using cams or eccentrics
F05B 2260/507 . . using servos, independent actuators, etc.

F05B 2260/60 . Fluid transfer

F05B 2260/601 . . using an ejector or a jet pump
F05B 2260/602 . . Drainage
F05B 2260/603 . . . of leakage having past a seal (seals F05B 2240/57; glands F05B 2240/63)
F05B 2260/604 . . Vortex non-clogging type pumps
F05B 2260/63 . . Preventing clogging or obstruction of flow paths by dirt, dust, or foreign particles
F05B 2260/64 . . Aeration, ventilation, dehumidification or moisture removal of closed spaces

F05B 2260/70 . Adjusting of angle of incidence or attack of rotating blades
F05B 2260/71 . . as a function of flow velocity
F05B 2260/72 . . by turning around an axis parallel to the rotor centre line
F05B 2260/74 . . by turning around an axis perpendicular the rotor centre line
F05B 2260/75 . . the adjusting mechanism not using auxiliary power sources ("servos")
F05B 2260/76 . . the adjusting mechanism using auxiliary power sources
F05B 2260/77 . . the adjusting mechanism driven or triggered by centrifugal forces
F05B 2260/78 . . the adjusting mechanism driven or triggered by aerodynamic forces
F05B 2260/79 . . Bearing, support or actuation arrangements therefor

F05B 2260/80 . Diagnostics

F05B 2260/82 . Forecasts
F05B 2260/821 . . Parameter estimation or prediction
F05B 2260/8211 . . . of the weather

F05B 2260/83 . Testing, e.g. methods, components or tools therefor

F05B 2260/84 . Modeling or simulation

F05B 2260/845 . Redundancy

F05B 2260/85 . Starting

F05B 2260/90 . Braking
F05B 2260/901 . . using aerodynamic forces, i.e. lift or drag
F05B 2260/9011 . . . of the tips of rotor blades
F05B 2260/902 . . using frictional mechanical forces
F05B 2260/903 . . using electrical or magnetic forces
F05B 2260/904 . . using hydrodynamic forces

F05B 2260/95 . Preventing corrosion (coating or surface treatment F05B 2230/90)

F05B 2260/96 . Preventing, counteracting or reducing vibration or noise
F05B 2260/962 . . my means creating "anti-noise"
F05B 2260/964 . . by damping means
F05B 2260/966 . . by correcting static or dynamic imbalance

F05B 2260/97 . Reducing windage losses

F05B 2260/972 . . in radial flow machines

F05B 2260/98 . Lubrication

F05B 2260/99 . Radar absorption

F05B 2270/00 Control

F05B 2270/10 . Purpose of the control system
F05B 2270/101 . . to control rotational speed (n)
F05B 2270/1011 . . . to prevent overspeed
F05B 2270/1012 . . . to prevent underspeed
F05B 2270/1013 . . . of different spools or shafts
F05B 2270/1014 . . . to keep rotational speed constant
F05B 2270/1016 . . in variable speed operation
F05B 2270/102 . . to control acceleration (u)
F05B 2270/1021 . . . by keeping it below damagingly high values
F05B 2270/1022 . . . by making it as high as possible
F05B 2270/103 . . to affect the output of the engine
F05B 2270/1031 . . . Thrust
F05B 2270/1032 . . . Torque
F05B 2270/1033 . . . Power (if explicitly mentioned)
F05B 2270/104 . . to match engine to driven device
F05B 2270/1041 . . . in particular the electrical frequency of driven generator
F05B 2270/105 . . to improve fuel economy
F05B 2270/1051 . . . in particular at idling speed
F05B 2270/106 . . to produce clean exhaust gases
F05B 2270/1061 . . . with as little smoke as possible
F05B 2270/1062 . . . with as little NOx`s as possible
F05B 2270/1063 . . . by monitoring combustion conditions
F05B 2270/1064 . . . . indirectly, at the exhaust
F05B 2270/107 . . to cope with emergencies
F05B 2270/1071 . . . in particular sudden load loss
F05B 2270/10711 . . . . applying a low voltage ride through method
F05B 2270/1072 . . . in particular blow-out and relight
F05B 2270/1073 . . . of one engine in a multi-engine system
F05B 2270/1074 . . . by using back-up controls
F05B 2270/1075 . . . by temporary overriding set control limits
F05B 2270/1076 . . . caused by water or hail ingestion
F05B 2270/108 . . to cope with, or avoid, compressor flow instabilities
F05B 2270/1081 . . . Compressor surge or stall
F05B 2270/10812 . . . . caused by working fluid flow velocity profile distortion
F05B 2270/10815 . . . . . due to high angle of attack of aircraft

F05B 2270/10817 . . . . . due to compressor degradation
F05B 2270/109 . . to prolong engine life
F05B 2270/1091 . . . by limiting temperatures
F05B 2270/1095 . . . by limiting mechanical stresses
F05B 2270/1097 . . . by preventing reverse rotation
F05B 2270/11 . . to maintain desired vehicle trajectory parameters
F05B 2270/1101 . . . Altitude
F05B 2270/1102 . . . Speed or Mach number
F05B 2270/111 . . to control two or more engines simultaneously
F05B 2270/15 . . to control thermoacoustic behaviour in the combustion chambers (counteracting noise or vibration F05B 2260/96)
F05B 2270/16 . . to control water or steam injection
F05B 2270/17 . . to avoid excessive deflection of the blades
F05B 2270/18 . . to control buoyancy
F05B 2270/19 . . to avoid stroboscopic flicker shadow on surroundings
F05B 2270/20 . . to optimise the performance of a machine

F05B 2270/30 . Control parameters, e.g. input parameters
F05B 2270/301 . . Pressure
F05B 2270/3011 . . . Inlet
F05B 2270/3013 . . . Outlet
F05B 2270/3015 . . . differential
F05B 2270/303 . . Temperature
F05B 2270/3032 . . . excessive temperatures, e.g. caused by overheating
F05B 2270/304 . . Spool rotational speed
F05B 2270/305 . . Tolerances
F05B 2270/309 . . Rate of change of parameters
F05B 2270/31 . . Fuel schedule for stage combustors
F05B 2270/32 . . Wind speeds
F05B 2270/3201 . . . "cut-off" or "shut-down" wind speed
F05B 2270/321 . . Wind directions
F05B 2270/322 . . the detection or prediction of a wind gust
F05B 2270/323 . . Air humidity
F05B 2270/324 . . Air pressure
F05B 2270/325 . . Air temperature
F05B 2270/326 . . Rotor angle
F05B 2270/327 . . Rotor or generator speeds
F05B 2270/328 . . Blade pitch angle
F05B 2270/329 . . Azimuth or yaw angle
F05B 2270/33 . . Proximity of blade to tower
F05B 2270/331 . . Mechanical loads
F05B 2270/332 . . Maximum loads or fatigue criteria
F05B 2270/333 . . Noise or sound levels

F05B 2270/334 . . Vibration measurements
F05B 2270/335 . . Output power or torque
F05B 2270/336 . . Blade lift measurements
F05B 2270/337 . . Electrical grid status parameters, e.g. voltage, frequency or power demand

F05B 2270/40 . Type of control system
F05B 2270/402 . . passive or reactive, e.g. using large wind vanes
F05B 2270/404 . . active, predictive, or anticipative

F05B 2270/50 . Control logic embodiment by
F05B 2270/502 . . electrical means, e.g. relays or switches
F05B 2270/504 . . electronic means, e.g. electronic tubes, transistors or IC`s within an electronic circuit
F05B 2270/506 . . hydraulic means, e.g. hydraulic valves within a hydraulic circuit
F05B 2270/508 . . mechanical means, e.g. levers, gears or cams

F05B 2270/60 . Control system actuates through
F05B 2270/602 . . electrical actuators
F05B 2270/604 . . hydraulic actuators
F05B 2270/605 . . Pneumatic actuators
F05B 2270/606 . . mechanical actuators (F05B 2270/602 takes precedence)

F05B 2270/70 . Type of control algorithm
F05B 2270/701 . . proportional
F05B 2270/702 . . differential
F05B 2270/703 . . integral
F05B 2270/704 . . proportional-differential
F05B 2270/705 . . proportional-integral
F05B 2270/706 . . proportional-integral-differential
F05B 2270/707 . . fuzzy logic
F05B 2270/708 . . with comparison tables
F05B 2270/709 . . with neural networks

F05B 2270/80 . Devices generating input signals, e.g. transducers, sensors, cameras or strain gauges
F05B 2270/802 . . Calibration thereof
F05B 2270/803 . . Sampling thereof
F05B 2270/804 . . Optical devices
F05B 2270/8041 . . . Cameras
F05B 2270/8042 . . . Lidar systems
F05B 2270/805 . . Radars
F05B 2270/806 . . Sonars
F05B 2270/807 . . Accelerometers
F05B 2270/808 . . Strain gauges; Load cells
F05B 2270/809 . . Encoders

F05B 2270/81 . . Microphones
F05B 2270/821 . . Displacement measuring means, e.g. inductive

F05B 2280/00 Materials; Properties thereof

F05B 2280/10 . Inorganic materials, e.g. metals
F05B 2280/101 . . Iron
F05B 2280/1011 . . Cast iron
F05B 2280/102 . . Light metals
F05B 2280/1021 . . . Aluminium
F05B 2280/1022 . . . Beryllium
F05B 2280/1023 . . . Boron
F05B 2280/1024 . . . Lithium
F05B 2280/1025 . . . Magnesium
F05B 2280/103 . . Heavy metals
F05B 2280/10301 . . . Refractory metals, e.g. V, W
F05B 2280/10302 . . . Chromium
F05B 2280/10303 . . . Molybdenum
F05B 2280/10304 . . . Titanium
F05B 2280/10305 . . . Zirconium
F05B 2280/10306 . . . Hafnium
F05B 2280/10307 . . . Manganese
F05B 2280/10308 . . . Lead
F05B 2280/10309 . . . Tin
F05B 2280/1031 . . . Zinc
F05B 2280/10311 . . . Mercury
F05B 2280/104 . . Noble metals
F05B 2280/1041 . . . Silver
F05B 2280/1042 . . . Gold
F05B 2280/1043 . . . Platinum group, e.g. Pt, Ir
F05B 2280/1044 . . . Palladium
F05B 2280/1045 . . . Ruthenium
F05B 2280/1046 . . . Osmium
F05B 2280/1047 . . . Iridium
F05B 2280/1048 . . . Rhodium
F05B 2280/105 . . Copper
F05B 2280/106 . . Rare earth metals, e.g. Sc, Y
F05B 2280/107 . . Alloys
F05B 2280/1071 . . . Steel alloys
F05B 2280/1072 . . Copper alloys
F05B 2280/10721 . . . Bronze
F05B 2280/10722 . . . Phosphor-bronze alloy

F05B 2280/10723 . . . Nickel-Copper alloy, e.g. monel
F05B 2280/1073 . . Aluminium alloy, e.g. AlCuMgPb
F05B 2280/1074 . . Alloys not otherwise provided for
F05B 2280/10741 . . . Superalloys
F05B 2280/10742 . . . Heat stable alloys
F05B 2280/10743 . . . Ni - Si alloys
F05B 2280/10744 . . . Metal-aluminide intermetalllic compounds

F05B 2280/20 . Inorganic materials, e.g. non-metallic materials
F05B 2280/2001 . . Glass
F05B 2280/20011 . . . MIBA
F05B 2280/20012 . . . Quartz
F05B 2280/2002 . . Phosphor
F05B 2280/2003 . . Silicon
F05B 2280/2004 . . Ceramics; Oxides
F05B 2280/20041 . . . Aluminium oxides
F05B 2280/20042 . . . Zinc oxides
F05B 2280/20043 . . . Zirconium oxides
F05B 2280/2005 . . Non-oxide ceramics
F05B 2280/2006 . . Carbon, e.g. graphite
F05B 2280/2007 . . Carbides
F05B 2280/20071 . . . of silicon
F05B 2280/20072 . . . of titanium, e.g. TiB
F05B 2280/20073 . . . of wolfram, e.g. tungsten carbide
F05B 2280/2008 . . Nitrides
F05B 2280/20081 . . . of aluminium
F05B 2280/20082 . . . of boron
F05B 2280/20083 . . . of silicon
F05B 2280/20084 . . . of titanium
F05B 2280/20085 . . . of zirconium
F05B 2280/2009 . . Sulfides
F05B 2280/20091 . . . of molybdenum
F05B 2280/201 . . Sapphire
F05B 2280/2011 . . Aluminium titanate
F05B 2280/2013 . . Silica
F05B 2280/2014 . . Arsenic
F05B 2280/2015 . . Antimony
F05B 2280/2016 . . Bismuth
F05B 2280/2017 . . Barium

F05B 2280/30 . Inorganic materials not otherwise provided for

F05B 2280/40 . Organic materials

F05B 2280/4001 .. Leather
F05B 2280/4002 .. Cellulosic materials, e.g. wood
F05B 2280/4003 .. Synthetic polymers, e.g. plastics; Rubber
F05B 2280/4004 .. Rubber
F05B 2280/4005 .. PTFE (PolyTetraFluorEthylene)
F05B 2280/4006 .. Polyamides, e.g. NYLON
F05B 2280/4007 .. Thermoplastics
F05B 2280/4008 .. Polyamides, e.g. Aurum
F05B 2280/4009 .. Polyetherketones, e.g. PEEK
F05B 2280/401 .. Silicon polymers
F05B 2280/4011 .. Organic materials not otherwise provided for

F05B 2280/50 . Intrinsic material properties or characteristics
F05B 2280/5001 .. Elasticity
F05B 2280/5002 .. Thermal properties
F05B 2280/5003 .. Expansivity
F05B 2280/50031 ... similar
F05B 2280/50032 ... dissimilar
F05B 2280/5004 .. Heat transfer
F05B 2280/5005 .. Reflective properties
F05B 2280/5006 .. Shape memory
F05B 2280/5007 .. Hardness
F05B 2280/5008 .. Magnetic properties
F05B 2280/5009 .. non-magnetic
F05B 2280/501 .. Self lubricating materials; Solid lubricants
F05B 2280/5011 .. Surface roughness

F05B 2280/60 . Properties or characteristics given to material by treatment or manufacturing
F05B 2280/6001 .. Fabrics
F05B 2280/6002 ... Woven fabrics
F05B 2280/6003 .. Composites; e.g. fibre-reinforced
F05B 2280/6004 .. amorphous
F05B 2280/6005 .. crystalline
F05B 2280/6006 .. Directionally-solidified crystalline structures
F05B 2280/6007 .. monocrystalline
F05B 2280/6008 .. Structures
F05B 2280/6009 .. Grain size
F05B 2280/601 .. Syntactic
F05B 2280/6011 .. Coating
F05B 2280/6012 .. Foam
F05B 2280/6013 .. Fibres
F05B 2280/6014 .. Filler
F05B 2280/6015 .. Resin

F05B 2280/70 . Treatments or modification of materials
F05B 2280/701 . . Heat treatments
F05B 2280/702 . . Reinforcements