CPC COOPERATIVE PATENT CLASSIFICATION

Y02T CLIMATE CHANGE MITIGATION TECHNOLOGIES RELATED TO TRANSPORTATION

WARNING

Subclass Y02T and its groups are not complete

10/00 Road transport of goods or passengers
10/10 . Internal combustion engine [ICE] based vehicles
10/12 . . Technologies for the improvement of indicated efficiency of a conventional ICE
10/121 . . . Adding non fuel substances to fuel, air or fuel/air mixture
10/123 . . . Fuel injection
10/125 . . . Combustion chambers and charge mixing enhancing inside the combustion chamber
10/126 . . . Treating fuel, air or air/fuel mixture
10/128 . . . Methods of operating, e.g. homogeneous charge compression ignition [HCCI], premixed charge compression ignition [PCCI]
10/14 . . Technologies for the improvement of mechanical efficiency of a conventional ICE
10/142 . . . Methods of operating, e.g. Atkinson cycle, Ericsson
10/144 . . . Non naturally aspirated engines, e.g. turbocharging, supercharging
10/146 . . . Charge mixing enhancing and kinetic or wave energy of charge outside the combustion chamber, i.e. ICE with external or indirect fuel injection
10/148 . . . Downsizing or downspeeding
10/16 . . Energy recuperation from low temperature heat sources of the ICE to produce additional power
10/163 . . . Turbocompound engines
10/166 . . . Waste heat recovering cycles or thermoelectric systems
10/17 . . Non-reciprocating piston engines, e.g. rotating motors
10/18 . . Varying inlet or exhaust valve operating characteristics
10/20 . . Exhaust after-treatment
10/22 . . . Three way catalyst technology, i.e. oxidation or reduction at stoichiometric equivalence ratio
10/24 . . . Selective Catalytic Reactors for reduction in oxygen rich atmosphere
10/26 . . . Thermal conditioning of exhaust after-treatment
10/30 . . Use of alternative fuels
10/32 . . . Gaseous fuels
10/34 . . . Non-gaseous fuels
10/36 . . . Multiple fuels, e.g. multi fuel engines
10/38 . . . Non-fossil fuels
10/40 . . Engine management systems
10/42 . . . controlling air supply
10/44 . . . controlling fuel supply
10/46 . . . controlling ignition
10/47 . . . Exhaust feedback
10/48 . . . Switching off the internal combustion engine, e.g. stop and go
10/50 . . Intelligent control systems, e.g. conjoint control
10/52 . . . relating to internal combustion engine fuel consumption
10/54 . . . relating to internal combustion engine emissions
10/56 . . . Optimising drivetrain operating point
10/60 . Other road transportation technologies with climate change mitigation effect (not used, see subgroups)
10/62 . . Hybrid vehicles
10/6204 . . . using ICE and mechanical energy storage, e.g. flywheel (mechanical storage units for electromobility in general Y02T 10/7027)
10/6208 . . . using ICE and fluidic energy storage, e.g. pressure accumulator
10/6213 . . . using ICE and electric energy storage, i.e. battery, capacitor (battery or capacitor technology for electromobility in general Y02T 10/7005, Y02T 10/7022)
10/6217 . . . . of the series type or range extenders
10/6221 . . . . of the parallel type
10/6226 . . . . . Motor-assist type
10/623 . . . . of the series-parallel type
10/6234 . . . . . Series-parallel switching type
10/6239 . . . . . Differential gearing distribution type
10/6243 . . . . . Electrical distribution type
10/6247 . . . . with motor integrated into gearbox
10/6252 . . . . . connected or connectable to input shaft of gearing
10/6256 . . . . . connected or connectable to intermediate shaft of gearing
10/626 . . . . . Motor between output shaft of gearing and driven wheels
10/6265 . . . . Driving a plurality of axles
10/6269 . . . . provided with means for plug-in
10/6273 . . . Combining different types of energy storage
10/6278 . . . . Battery and capacitor
10/6282 . . . . Battery and mechanical or fluidic energy storage
10/6286 . . . Control systems for power distribution between ICE and other motor or motors
10/6291 . . . . Predicting future driving conditions
10/6295 . . . Other types of combustion engine
10/64 . . Electric machine technologies for applications in electromobilty
10/641 . . . characterised by aspects of the electric machine
10/642 . . . Control strategies of electric machines for automotive applications
10/643 . . . . Vector control
10/644 . . . . Control strategies for ac machines other than vector control
10/645 . . . . Control strategies for dc machines
10/646 . . . . Number of electric drive machines

10/647 . . . . . One electric drive machine
10/648 . . . . . Two electric drive machines
10/649 . . . . . More than two electric drive machines
10/70 . . Energy storage for electromobility (hydrogen internal combustion engines Y02T 90/42; fuel cell powered electric vehicles Y02T 90/34)
10/7005 . . . Batteries
10/7011 . . . . Lithium ion battery
10/7016 . . . . Lead acid battery
10/7022 . . . Capacitors, supercapacitors or ultracapacitors
10/7027 . . . Mechanical energy storage devices
10/7033 . . . . Fly wheels
10/7038 . . . Energy storage management
10/7044 . . . . Controlling the battery or capacitor state of charge
10/705 . . . . Controlling vehicles with one battery or one capacitor only
10/7055 . . . . Controlling vehicles with more than one battery or more than one capacitor
10/7061 . . . . . the batteries or capacitors being of the same voltage
10/7066 . . . . . the batteries or capacitors being of a different voltage
10/7072 . . . Electromobility specific charging systems or methods for batteries, ultracapacitors, supercapacitors or double-layer capacitors (efficient charging systems for batteries, ultracapacitors, supercapacitors or double-layer capacitors in road transportation in general Y02T 10/92)
10/7077 . . . . on board the vehicle
10/7083 . . . . . with the energy being of renewable origin
10/7088 . . . . Charging stations
10/7094 . . . . . with the energy being of renewable origin
10/72 . . Electric energy management in electromobility
10/7208 . . . Electric power conversion within the vehicle
10/7216 . . . . DC to DC power conversion
10/7225 . . . . . Using step - up or boost converters
10/7233 . . . . . Using step - down or buck converters
10/7241 . . . . DC to AC or AC to DC power conversion
10/725 . . . . AC to AC power conversion
10/7258 . . . Optimisation of vehicle performance
10/7266 . . . . Automated control
10/7275 . . . . Desired performance achievement
10/7283 . . . . Optimisation of energy managament
10/7291 . . . . Route optimisation
10/76 . . Transmission of mechanical power
10/80 . Technologies aiming to reduce green house gasses emissions common to all road transportation technologies
10/82 . . Tools or systems for aerodynamic design
10/84 . . Data processing systems or methods, management, administration
10/86 . . Optimisation of rolling resistance
10/862 . . . Tyres, e.g. materials, shape
10/865 . . . Bearings
10/867 . . . Others, e.g. wheel construction
10/88 . . Optimized components or subsystems, e.g. lighting, actively controlled glasses
10/90 . . Energy harvesting concepts as power supply for auxiliaries' energy consumption, e.g. photovoltaic sun-roof
10/92 . . Energy efficient charging or discharging systems for batteries, ultracapacitors, supercapacitors or double-layer capacitors specially adapted for vehicles

30/00 Transportation of goods or passengers via railways
30/10 . Energy recovery technologies concerning the propulsion system in locomotives or motor railcars
30/12 . . In electric locomotives or motor railcars with electric accumulators, e.g. involving regenerative braking
30/14 . . In locomotives or motor railcars with pneumatic accumulators
30/16 . . In locomotives or motor railcars with two or different kinds or types of engine
30/18 . . Specific power storing devices
30/30 . Other technological aspects of railway vehicles
30/32 . . Reducing air resistance by modifying contour
30/34 . . Composite; Lightweight materials
30/36 . . Device for using the energy of the movements of the vehicle
30/38 . . Bogie frames comprising parts made from fiber-reinforced matrix material
30/40 . . Applications of solar cells or heat pipes, e.g. on ski-lift cabins or carriages for passengers or goods
30/42 . . concerning heating, ventilating or air conditioning

50/00 Aeronautics or air transport
50/10 . Drag reduction
50/12 . . Overall configuration, shape or profile of fuselage or wings
50/14 . . Adaptive structures
50/145 . . . Morphing wings or smart wings
50/16 . . by influencing airflow
50/162 . . . Wing tip vortex reduction
50/164 . . . . Winglets
50/166 . . . by influencing the boundary layer
50/168 . . . . actively
50/30 . Wing lift efficiency
50/32 . . Optimised high lift wing systems
50/34 . . Helicopter rotor blades lift efficiency
50/40 . Weight reduction
50/42 . . Airframe
50/43 . . . Materials
50/433 . . . . Composites
50/436 . . . . Metallic lightweight
50/44 . . . Design measures
50/46 . . Interior
50/47 . . . Materials
50/48 . . . Design measures
50/50 . On board measures aiming to increase energy efficiency
50/52 . . concerning the electrical systems
50/53 . . . Energy recovery, conversion or storage systems
50/54 . . . Electric actuators or motors
50/545 . . . . All electric architecture
50/56 . . Thermal management
50/57 . . . Reduction of energy losses
50/58 . . . Optimization of hot and cold sources on board an aircraft
50/60 . Efficient propulsion technologies
50/62 . . Electrical
50/64 . . Hybrid

50/66 . . Propellers
50/67 . . Relevant aircraft propulsion technologies
50/671 . . . Measures to reduce the propulsor weight
50/672 . . . . using composites
50/673 . . . Improving the rotor blades aerodynamic
50/675 . . . Enabling an increased combustion temperature by cooling
50/676 . . . . Blades cooling
50/677 . . . Controlling the propulsor to control the emissions
50/678 . . . using fuels of non-fossil origin
50/69 . . Solar cells as on board power source
50/70 . Enabling use of sustainable fuels
50/72 . . Synthetic fuels
50/74 . . Bio fuels
50/80 . Energy efficient operational measures
50/82 . . Related to ground operations
50/823 . . . Aircraft equipment, e.g. wheel embedded
50/826 . . . Ground equipment
50/84 . . Related to management of trajectory and mission

70/00 Maritime or waterways transport
70/10 . Measures concerning design or construction of watercraft hulls
70/12 . . Improving hydrodynamics of hull
70/121 . . . Reducing surface friction
70/122 . . . . Air lubrication, air cavity systems
70/123 . . . . Hull coatings, e.g. biomimicry
70/125 . . . Lower wave resistance
70/126 . . . . Bow shape
70/127 . . . improving wake pattern
70/128 . . . . reducing the interaction between hull and propeller
70/14 . . Construction of hull
70/143 . . . Materials, e.g. ultra light steels, composites
70/146 . . . Energy efficient measures related to fabrication or assembly of hull
70/30 . Measures at the maintenance or repair stage specially aiming at green house gasses emissions reduction
70/32 . . Surface or tank cleaning and treatment operations
70/34 . . Improved operation of fossil fuel transfer, e.g. ship-to-ship oil or gas transfer
70/36 . . Handling waste
70/50 . Measures to reduce greenhouse gas emissions related to the propulsion system
70/52 . . Propulsion power plant
70/5209 . . . Relating to type of fuel
70/5218 . . . . Less carbon-intensive fuels, e.g. natural gas, biofuels
70/5227 . . . . Non-conventional fuels, e.g. nuclear
70/5236 . . . Renewable or hybrid-electric solutions
70/5245 . . . . using solar generated electricity, e.g. photovoltaics
70/5254 . . . . using wind motor to generate electricity
70/5263 . . . Other measures to increase efficiency of the power plant
70/5272 . . . . Engine monitoring and control
70/5281 . . . . Waste heat recovery
70/529 . . . . Reducing auxiliary power
70/54 . . Propeller
70/542 . . . Improved propeller design
70/545 . . . Recovery of rotational energy
70/547 . . . Wake equalizing arrangements
70/56 . . Jets
70/58 . . Propulsion by direct use of wind
70/583 . . . Energy efficient technologies involving sails
70/586 . . . Kites
70/59 . . Other propulsion concepts for reducing greenhouse gas emissions, e.g. wave-powered
70/70 . Technologies for a more efficient operation of the waterborne vessel not otherwise provided for
70/72 . . Related to heating, ventilation, air conditioning, or refrigeration systems
70/74 . . Integrating maritime voyage control
70/742 . . . Speed reduction
70/745 . . . Weather routing
70/747 . . . Course optimization
70/80 . Measures concerning recycling, retrofitting or dismantling of waterborne vessels
70/90 . Port equipment or systems reducing GHG emissions

90/00 Enabling technologies or technologies with a potential or indirect contribution to GHG emissions mitigation
90/10 . Technologies related to electric vehicle charging (not used, see subgroups)
90/12 . . Electric charging stations
90/121 . . . by conductive energy transmission
90/122 . . . by inductive energy transmission
90/124 . . . by exchange of energy storage elements
90/125 . . . Alignment between the vehicle and the charging station
90/127 . . . Converters or inverters for charging
90/128 . . . Energy exchange control or determination
90/14 . . Plug-in electric vehicles
90/16 . . Information or communication technologies improving the operation of electric vehicles
90/161 . . . Navigation
90/162 . . . . Position determination
90/163 . . . Information or communication technologies for charging station selection
90/164 . . . . Charging station suitability
90/165 . . . . Charging station location
90/166 . . . . Charging station availability
90/167 . . . Systems integrating technologies related to power network operation and communication or information technologies for supporting the interoperability of electric or hybrid vehicles, i.e. smartgrids as interface for battery charging of electric and hybrid vehicles (power aggregation of HEV or EV Y02E 60/721) (not used, see subgroups)

NOTE

Documents tagged under Y02T 90/167 are concurrently tagged also under Y04S 30/10

90/168 . . . . Remote or cooperative charging operation
90/169 . . . . Aspects supporting the interoperability of electric or hybrid vehicles, e.g. recognition, authentication, identification or billing
90/30 . Application of fuel cell technology to transportation (not used, see subgroups)
90/32 . . Fuel cells specially adapted to transport applications, e.g. automobile, bus, ship
90/34 . . Fuel cell powered electric vehicles [FCEV]

90/36 . . Fuel cells as on-board power source in aeronautics
90/38 . . Fuel cells as on-board power source in waterborne transportation
90/40 . Application of hydrogen technology to transportation (Y02T 90/30 takes precedence) (not used, see subgroups)
90/42 . . Hydrogen as fuel for road transportation
90/44 . . Hydrogen as fuel in aeronautics
90/46 . . Hydrogen as fuel in waterborne transportation