

CPC COOPERATIVE PATENT CLASSIFICATION

B PERFORMING OPERATIONS; TRANSPORTING

(NOTES omitted)

TRANSPORTING

B64 AIRCRAFT; AVIATION; COSMONAUTICS

B64C AEROPLANES; HELICOPTERS (air-cushion vehicles [B60V](#))

NOTE

As far as possible, classification is made according to constructional features; classification according to particular kinds of aircraft is normally regarded as being of secondary importance, except in cases where this is considered to be the characteristic feature.

WARNINGS

- The following IPC groups are not in the CPC scheme. The subject matter for these IPC groups is classified in the following CPC groups:
[B64C 35/02](#) covered by [B64C 35/00](#)
- 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.

Aircraft structures or fairings (boundary-layer controls [B64C 21/00](#))

1/00 Fuselages; Constructional features common to fuselages, wings, stabilising surfaces and the like (aerodynamical features common to fuselages, wings, stabilising surfaces, and the like [B64C 23/00](#); flight-deck installations [B64D](#))

1/0009 . {Aerodynamic aspects}

WARNING

Group [B64C 1/0009](#) is impacted by reclassification into group [B64C 39/029](#).

Groups [B64C 1/0009](#) and [B64C 39/029](#) should be considered in order to perform a complete search.

2001/0018 . {comprising two decks adapted for carrying passengers only}

2001/0027 . . {arranged one above the other}

2001/0036 . . {arranged side by side at the same level}

2001/0045 . {Fuselages characterised by special shapes}

WARNING

Group [B64C 2001/0045](#) is impacted by reclassification into group [B64C 39/029](#).

Groups [B64C 2001/0045](#) and [B64C 39/029](#) should be considered in order to perform a complete search.

2001/0054 . {Fuselage structures substantially made from particular materials}

2001/0063 . . {from wood}

2001/0072 . . {from composite materials}

2001/0081 . . {from metallic materials}

2001/009 . {comprising decompression panels or valves for pressure equalisation in fuselages or floors}

1/06 . Frames; Stringers; Longerons {; Fuselage sections}

1/061 . . {Frames}

1/062 . . . {specially adapted to absorb crash loads}

1/063 . . . {Folding or collapsing to reduce overall dimensions, e.g. foldable tail booms (folding or collapsing wings [B64C 3/56](#))}

1/064 . . {Stringers; Longerons}

1/065 . . {Spars}

1/066 . . {Interior liners}

1/067 . . . {comprising means for preventing icing or condensation conditions}

1/068 . . {Fuselage sections}

WARNING

Group [B64C 1/068](#) is impacted by reclassification into groups [B64C 1/0683](#) and [B64C 1/0685](#).

Groups [B64C 1/068](#), [B64C 1/0683](#), and [B64C 1/0685](#) should be considered in order to perform a complete search.

1/0683 . . . {Nose cones}

WARNING

Group [B64C 1/0683](#) is incomplete pending reclassification of documents from group [B64C 1/068](#).

Groups [B64C 1/068](#) and [B64C 1/0683](#) should be considered in order to perform a complete search.

1/0685 . . . {Tail cones}

WARNING

Group [B64C 1/0685](#) is incomplete pending reclassification of documents from group [B64C 1/068](#).

Groups [B64C 1/068](#) and [B64C 1/0685](#) should be considered in order to perform a complete search.

- 1/069 . . . {Joining arrangements therefor}
- 1/08 . . Geodetic or other open-frame structures
- 1/10 . . Bulkheads
- 1/12 . . Construction or attachment of skin panels
- 1/14 . . Windows; Doors; Hatch covers or access panels; Surrounding frame structures; Canopies; Windscreens {accessories therefor, e.g. pressure sensors, water deflectors, hinges, seals, handles, latches, windscreen wipers} (fairings movable in conjunction with undercarriage elements [B64C 25/16](#); bomb doors [B64D 1/06](#))
- 1/1407 . . {Doors; surrounding frames}
- 1/1415 . . . {Cargo doors, e.g. incorporating ramps}
- 1/1423 . . . {Passenger doors}
- 1/143 {of the plug type}
- 1/1438 {of the sliding type}
- 1/1446 . . . {Inspection hatches (for engine cowls [B64D 29/08](#))}
- 1/1453 . . . {Drain masts}
- 1/1461 . . . {Structures of doors or surrounding frames}
- 1/1469 . . . {Doors between cockpit and cabin}
- 1/1476 . . {Canopies; Windscreens or similar transparent elements}
- 1/1484 . . . {Windows ([B64C 1/1492](#) takes precedence)}
- 1/1492 . . . {Structure and mounting of the transparent elements in the window or windscreen}
- 1/16 . specially adapted for mounting power plant
- 1/18 . Floors
- 1/20 . . specially adapted for freight
- 1/22 . Other structures integral with fuselages to facilitate loading {, e.g. cargo bays, cranes (cargo door type ramps [B64C 1/1415](#))}
- 1/24 . Steps mounted on, and retractable within, fuselages (readily removable [B64D 9/00](#))
- 1/26 . Attaching the wing or tail units or stabilising surfaces
- 1/28 . Parts of fuselage relatively movable to improve pilots view
- 1/30 . Parts of fuselage relatively movable to reduce overall size for storage
- 1/32 . Severable or jettisonable parts of fuselage facilitating emergency escape (ejector seats [B64D 25/10](#))
- 1/34 . comprising inflatable structural components (connection of valves to inflatable elastic bodies [B60C 29/00](#))
- 1/36 . adapted to receive antennas or radomes (antennas or radomes per se [H01Q](#))
- 1/38 . Constructions adapted to reduce effects of aerodynamic or other external heating {(cooling structural parts of aircrafts with air flow [B64D 13/006](#))}
- 1/40 . Sound or heat insulation {, e.g. using insulation blankets (insulating elements for vehicles, in general [B60R 13/08](#))}
- 1/403 . . {Arrangement of fasteners specially adapted therefor, e.g. of clips (in vehicles in general [B60R 13/0206](#))}
- 1/406 . . . {in combination with supports for lines, e.g. for pipes or cables (arrangement of elements of electric or fluid circuits specially adapted for vehicles, in general [B60R 16/00](#); supports for pipes, cables or protective tubing [F16L 3/00](#); installations of electric cables or lines in vehicles [H02G 3/00](#))}
- 3/00 **Wings** (stabilising surfaces [B64C 5/00](#); ornithopter wings [B64C 33/02](#))
- 3/10 . Shape of wings
- WARNING**
Group [B64C 3/10](#) is impacted by reclassification into group [B64C 39/029](#).
Groups [B64C 3/10](#) and [B64C 39/029](#) should be considered in order to perform a complete search.
- 3/14 . . Aerofoil profile
- 3/141 . . . {Circulation Control Airfoils}
- 2003/142 . . . {with variable camber along the airfoil chord}
- 2003/143 . . . {comprising interior channels}
- 2003/144 . . . {including a flat surface on either the extrados or intrados}
- 2003/145 . . . {comprising 'Gurney' flaps}
- 2003/146 . . . {comprising leading edges of particular shape}
- 2003/147 . . . {comprising trailing edges of particular shape}
- 2003/148 . . . {comprising protuberances, e.g. for modifying boundary layer flow}
- 2003/149 . . . {for supercritical or transonic flow}
- 3/16 . . Frontal aspect
- WARNING**
Group [B64C 3/16](#) is impacted by reclassification into group [B64C 39/029](#).
Groups [B64C 3/16](#) and [B64C 39/029](#) should be considered in order to perform a complete search.
- 3/18 . Spars; Ribs; Stringers (attaching wing unit to fuselage [B64C 1/26](#))
- 3/182 . . {Stringers, longerons}
- 3/185 . . {Spars}
- 3/187 . . {Ribs}
- 3/20 . Integral or sandwich constructions (layered products or sandwich constructions in general [B32B](#))
- 3/22 . Geodetic or other open-frame structures
- 3/24 . Moulded or cast structures
- 3/26 . Construction, shape, or attachment of separate skins, e.g. panels
- 3/28 . Leading or trailing edges attached to primary structures, e.g. forming fixed slots
- 3/30 . comprising inflatable structural components (connection of valves to inflatable elastic bodies [B60C 29/00](#))
- 3/32 . specially adapted for mounting power plant
- 3/34 . Integrally-constructed tanks, e.g. for fuel (other aircraft fuel tanks or fuel systems [B64D](#))
- 3/36 . Structures adapted to reduce effects of aerodynamic or other external heating {(cooling structural parts of aircrafts with air flow [B64D 13/006](#))}
- 3/38 . Adjustment of complete wings or parts thereof
- 3/385 . . {Variable incidence wings}
- 3/40 . . Varying angle of sweep

- 3/42 . . Adjusting about chordwise axes
- 3/44 . . Varying camber
- 2003/445 . . . {by changing shape according to the speed, e.g. by morphing}
- 3/46 . . . by inflatable elements (connection of valves to inflatable elastic bodies [B60C 29/00](#))
- 3/48 . . . by relatively-movable parts of wing structures
- 3/50 . . . by leading or trailing edge flaps (ailerons [B64C 9/00](#))
- 3/52 . . Warping
- 3/54 . . Varying in area (flaps extendable to increase camber [B64C 3/44](#))
- 2003/543 . . . {by changing shape according to the speed, e.g. by morphing}
- 3/546 . . . {by foldable elements}
- 3/56 . . Folding or collapsing to reduce overall dimensions of aircraft
- 3/58 . provided with fences or spoilers (adjustable for control purposes [B64C 9/00](#))
- 5/00** **Stabilising surfaces** (attaching stabilising surfaces to fuselage [B64C 1/26](#))
- 5/02 . Tailplanes (fins [B64C 5/06](#))
- 5/04 . Noseplanes
- 5/06 . Fins (specially for wings [B64C 5/08](#))
- 5/08 . mounted on or supported by wings
- 5/10 . adjustable
- 5/12 . . for retraction against or within fuselage or nacelle
- 5/14 . . Varying angle of sweep
- 5/16 . . about spanwise axes
- 5/18 . . in area (attaching stabilising surfaces to fuselage [B64C 1/26](#))
- 7/00** **Structures or fairings not otherwise provided for**
- WARNING**
- Group [B64C 7/00](#) is impacted by reclassification into group [B64C 39/029](#).
- Groups [B64C 7/00](#) and [B64C 39/029](#) should be considered in order to perform a complete search.
- 7/02 . Nacelles
- 9/00** **Adjustable control surfaces or members, e.g. rudders** (trimming stabilising surfaces [B64C 5/10](#))
- 2009/005 . {Ailerons}
- 9/02 . Mounting or supporting thereof
- 9/04 . with compound dependent movements
- 9/06 . with two or more independent movements
- 9/08 . bodily displaceable (varying camber of wings [B64C 3/44](#))
- 9/10 . one surface adjusted by movement of another, e.g. servo tabs ([B64C 9/04](#) takes precedence; adjusting surfaces of different type or function [B64C 9/12](#))
- 9/12 . surfaces of different type or function being simultaneously adjusted
- 9/14 . forming slots (boundary-layer control [B64C 21/00](#))
- 2009/143 . . {comprising independently adjustable elements for closing or opening the slot between the main wing and leading or trailing edge flaps}
- 9/146 . . {at an other wing location than the rear or the front (wings provided with fixed fences or spoilers [B64C 3/58](#))}
- 9/16 . . at the rear of the wing
- 9/18 . . . by single flaps

- 9/20 . . . by multiple flaps
- 9/22 . . at the front of the wing
- 9/24 . . . by single flap
- 9/26 . . . by multiple flaps
- 9/28 . . by flaps at both the front and rear of the wing operating in unison
- 9/30 . Balancing hinged surfaces, e.g. dynamically
- 9/32 . Air braking surfaces (braking by parachutes [B64D 17/80](#))
- 9/323 . . {associated with wings}
- 9/326 . . {associated with fuselages}
- 9/34 . collapsing or retracting against or within other surfaces or other members
- 9/36 . . the members being fuselages or nacelles
- 9/38 . Jet flaps

11/00 **Propellers, e.g. of ducted type; Features common to propellers and rotors for rotorcraft (rotors specially adapted for rotorcraft [B64C 27/32](#))**

NOTE

Documents classified in [B64C 11/001](#) - [B64C 11/008](#) which also contain relevant information, covered by other subgroups of [B64C 11/00](#), are also classified in the appropriate subgroup of [B64C 11/00](#)

- 11/001 . {Shrouded propellers}
- 11/002 . {Braking propellers, e.g. for measuring the power output of an engine}
- 11/003 . {Variable-diameter propellers; Mechanisms therefor}
- 11/005 . {Spiral-shaped propellers}
- 11/006 . {Paddle wheels}
- 11/007 . {Propulsive discs, i.e. discs having the surface specially adapted for propulsion purposes}
- 11/008 . {characterised by vibration absorbing or balancing means (for rotorcraft [B64C 27/001](#))}
- 11/02 . Hub construction
- 11/04 . . Blade mountings
- 11/06 . . . for variable-pitch blades
- 11/065 {variable only when stationary}
- 11/08 . . . for non-adjustable blades
- 11/10 rigid
- 11/12 flexible
- 11/14 . . Spinners
- 11/16 . Blades
- 11/18 . . Aerodynamic features
- 11/20 . . Constructional features
- 11/205 . . . {for protecting blades, e.g. coating}
- 11/22 . . . Solid blades
- 11/24 . . . Hollow blades
- 11/26 . . . Fabricated blades
- 11/28 . . . Collapsible or foldable blades
- 11/30 . Blade pitch-changing mechanisms

NOTE

Groups [B64C 11/301](#), [B64C 11/303](#), [B64C 11/305](#) and [B64C 11/306](#) take precedence over [B64C 11/32](#), [B64C 11/38](#) and [B64C 11/44](#)

- 11/301 . . {characterised by blade position indicating means}
- 11/303 . . {characterised by comprising a governor}

- 11/305 . . {characterised by being influenced by other control systems, e.g. fuel supply}
- 11/306 . . {specially adapted for contrarotating propellers}
- 11/308 . . . {automatic}
- 11/32 . . mechanical
- 11/325 . . . {comprising feathering, braking or stopping systems}
- 11/34 . . . automatic
- 11/343 {actuated by the centrifugal force or the aerodynamic drag acting on the blades}
- 11/346 {actuated by the centrifugal force or the aerodynamic drag acting on auxiliary masses or surfaces}
- 11/36 . . . non-automatic
- 11/38 . . fluid, e.g. hydraulic
- 11/385 . . . {comprising feathering, braking or stopping systems}
- 11/40 . . . automatic
- 11/42 . . . non-automatic
- 11/44 . . electric
- 11/46 . Arrangements of or constructional features peculiar to multiple propellers {[\(B64C 11/306 takes precedence\)](#)}
- 11/48 . . Units of two or more coaxial propellers
- 11/50 . . Phase synchronisation between multiple propellers
- 13/00 Control systems or transmitting systems for actuating flying-control surfaces, lift-increasing flaps, air brakes, or spoilers**
- 13/02 . Initiating means
- 13/04 . . actuated personally
- 13/042 . . . {operated by hand}
- 13/0421 {control sticks for primary flight controls}
- 13/0423 {yokes or steering wheels for primary flight controls}
- 13/0425 {for actuating trailing or leading edge flaps, air brakes or spoilers}
- 13/0427 {for actuating trim}
- 13/044 . . . {operated by feet, e.g. pedals}
- 13/06 . . . adjustable to suit individual persons
- 13/08 . . . Trimming zero positions
- 13/10 . . . comprising warning devices
- 13/12 . . . Dual control apparatus
- 13/14 . . . lockable ([locking in position to suit individual persons B64C 13/06](#))
- 13/16 . . actuated automatically, e.g. responsive to gust detectors
- 13/18 . . . using automatic pilot
- 13/20 . . . using radiated signals
- 13/22 . . . readily revertible to personal control
- 13/24 . Transmitting means
- 13/26 . . without power amplification or where power amplification is irrelevant
- 13/28 . . . mechanical
- 13/30 using cable, chain, or rod mechanisms
- 13/32 using cam mechanisms
- 13/34 using toothed gearing
- 13/341 {having duplication or stand-by provisions}
- 13/343 {overriding of personal controls; with automatic return to inoperative position}
- 13/345 {with artificial feel}
- 13/36 . . . fluid
- 13/38 . . . with power amplification
- 13/40 using fluid pressure
- 13/42 having duplication or stand-by provisions
- 13/44 overriding of personal controls; with automatic return to inoperative position
- 13/46 with artificial feel
- 13/48 characterised by the fluid being gaseous
- 13/50 . . . using electrical energy
- 13/503 {Fly-by-Wire}
- 13/504 {using electro-hydrostatic actuators [EHA's]}
- 13/505 {having duplication or stand-by provisions}
- 13/506 {overriding of personal controls; with automatic return to inoperative position}
- 13/507 {with artificial feel}
- 15/00 Attitude, flight direction, or altitude control by jet reaction**
- 15/02 . the jets being propulsion jets
- 15/12 . . the power plant being tiltable
- 15/14 . the jets being other than main propulsion jets ([jet flaps B64C 9/38](#))
- 17/00 Aircraft stabilisation not otherwise provided for**
- 17/02 . by gravity or inertia-actuated apparatus
- 17/04 . . by pendular bodies
- 17/06 . . by gyroscopic apparatus ([automatic pilot control B64C 13/18](#))
- 17/08 . by ballast supply or discharge ([for lighter-than-air aircraft B64B](#))
- 17/10 . Transferring fuel to adjust trim
- 19/00 Aircraft control not otherwise provided for**
- 19/02 . Conjoint controls
- Influencing air-flow over aircraft surfaces, not otherwise provided for**
- 21/00 Influencing air-flow over aircraft surfaces by affecting boundary-layer flow ([boundary-layer control in general F15D](#))**
- 21/02 . by use of slot, ducts, porous areas, or the like
- 21/025 . . {for simultaneous blowing and sucking}
- 21/04 . . for blowing ([B64C 21/08 takes precedence](#))
- 21/06 . . for sucking ([B64C 21/08 takes precedence](#))
- 21/08 . . adjustable
- 21/10 . using other surface properties, e.g. roughness
- 23/00 Influencing air-flow over aircraft surfaces, not otherwise provided for**
- 23/005 . {by other means not covered by groups [B64C 23/02](#) - [B64C 23/08](#), e.g. by electric charges, magnetic panels, piezoelectric elements, static charges or ultrasounds}
- 23/02 . by means of rotating members of cylindrical or similar form
- 23/04 . by generating shock waves
- 23/06 . by generating vortices
- 23/065 . . {at the wing tips}
- 23/069 . . . {using one or more wing tip airfoil devices, e.g. winglets, splines, wing tip fences or raked wingtips}
- 23/072 {the wing tip airfoil devices being moveable in their entirety}

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| <div>23/076</div> <ul style="list-style-type: none"> . . . {the wing tip airfoil devices comprising one or more separate moveable members thereon affecting the vortices, e.g. flaps} <div>23/08</div> <ul style="list-style-type: none"> . using Magnus effect <div>25/00</div> <p>Alighting gear (air-cushion alighting gear B60V 3/08)</p> <div>25/001</div> <ul style="list-style-type: none"> . {Devices not provided for in the groups B64C 25/02 - B64C 25/68} <div>2025/003</div> <ul style="list-style-type: none"> . . {Means for reducing landing gear noise, or turbulent flow around it, e.g. landing gear doors used as deflectors} <div>2025/005</div> <ul style="list-style-type: none"> . . {Tail skids for fuselage tail strike protection on tricycle landing gear aircraft} <div>2025/006</div> <ul style="list-style-type: none"> . . {Landing gear legs comprising torque arms} <div>2025/008</div> <ul style="list-style-type: none"> . . {Comprising means for modifying their length, e.g. for kneeling, for jumping, or for leveling the aircraft} <div>25/02</div> <ul style="list-style-type: none"> . Undercarriages <div>25/04</div> <ul style="list-style-type: none"> . . Arrangement or disposition on aircraft <div>25/06</div> <ul style="list-style-type: none"> . . fixed <div>25/08</div> <ul style="list-style-type: none"> . . non-fixed, e.g. jettisonable <div>25/10</div> <ul style="list-style-type: none"> . . . retractable, foldable, or the like <div>25/12</div> <ul style="list-style-type: none"> sideways <div>2025/125</div> <ul style="list-style-type: none"> {into the fuselage, e.g. main landing gear pivotally retracting into or extending out of the fuselage} <div>25/14</div> <ul style="list-style-type: none"> fore-and-aft <div>25/16</div> <ul style="list-style-type: none"> Fairings movable in conjunction with undercarriage elements <div>25/18</div> <ul style="list-style-type: none"> Operating mechanisms <div>25/20</div> <ul style="list-style-type: none"> mechanical <div>25/22</div> <ul style="list-style-type: none"> fluid <div>25/24</div> <ul style="list-style-type: none"> electric <div>25/26</div> <ul style="list-style-type: none"> Control or locking systems therefor <div>25/28</div> <ul style="list-style-type: none"> with indicating or warning devices <div>25/30</div> <ul style="list-style-type: none"> emergency actuated <div>25/32</div> <ul style="list-style-type: none"> . characterised by the ground or like engaging elements (arrestor hooks B64C 25/68) <div>2025/325</div> <ul style="list-style-type: none"> . . {specially adapted for helicopters} <div>25/34</div> <ul style="list-style-type: none"> . . wheeled type, e.g. multi-wheeled bogies <div>2025/345</div> <ul style="list-style-type: none"> . . . {Multi-wheel bogies having one or more steering axes} <div>25/36</div> <ul style="list-style-type: none"> . . . Arrangements or adaptations of wheels, tyres, or axles in general (construction of wheels or axles B60B; construction of tyres in general B60C) <div>25/38</div> <ul style="list-style-type: none"> . . endless-track type <div>25/40</div> <ul style="list-style-type: none"> . . the elements being rotated before touch-down <div>25/405</div> <ul style="list-style-type: none"> . . . {Powered wheels, e.g. for taxing} <div>25/42</div> <ul style="list-style-type: none"> . . Arrangements or adaptations of brakes (the ground braking force being regulated, at least in part, by a speed condition, e.g. acceleration or deceleration of the ground engaging alighting gear, B60T 8/32) <div>25/423</div> <ul style="list-style-type: none"> . . . {Braking devices acting by reaction of gaseous medium (B64C 25/426 takes precedence; using rockets B64D 27/023)} <div>25/426</div> <ul style="list-style-type: none"> . . . {Braking devices providing an automatic sequence of braking} <div>25/44</div> <ul style="list-style-type: none"> . . . Actuating mechanisms <div>25/445</div> <ul style="list-style-type: none">{Brake regulators for preventing somersaulting} | <div>25/46</div> <ul style="list-style-type: none"> Brake regulators for preventing skidding or aircraft somersaulting ({anti-skidding regulators; electric or electronic controllers therefor B60T 8/1703}) <div>25/48</div> <ul style="list-style-type: none"> differentially operated for steering purposes <div>25/50</div> <ul style="list-style-type: none"> . . Steerable undercarriages; Shimmy damping (steering devices applicable to land vehicles B62D) <div>25/505</div> <ul style="list-style-type: none"> . . . {Shimmy damping} <div>25/52</div> <ul style="list-style-type: none"> . . Skis or runners <div>25/54</div> <ul style="list-style-type: none"> . . Floats <div>25/56</div> <ul style="list-style-type: none"> . . . inflatable (connection of valves to inflatable elastic bodies B60C 29/00) <div>25/58</div> <ul style="list-style-type: none"> . . Arrangements or adaptations of shock-absorbers or springs (shimmy dampers B64C 25/50; vehicle suspension arrangements in general B60G; shock absorber per se F16F) <div>25/60</div> <ul style="list-style-type: none"> . . . Oleo legs <div>25/62</div> <ul style="list-style-type: none"> . . . Spring shock-absorbers; Springs <div>25/64</div> <ul style="list-style-type: none"> using rubber or like elements <div>25/66</div> <ul style="list-style-type: none"> . . Convertible alighting gear; Combinations of different kinds of ground or like engaging elements <div>25/68</div> <ul style="list-style-type: none"> . Arrestor hooks (arresting gear, e.g. on aircraft carriers B64F) <div>Aircraft kinds and components not otherwise provided for</div> <div>27/00</div> <p>Rotorcraft; Rotors peculiar thereto (alighting gear B64C 25/00)</p> <div>27/001</div> <ul style="list-style-type: none"> . {Vibration damping devices} <div>2027/002</div> <ul style="list-style-type: none"> . . {mounted between the rotor drive and the fuselage} <div>2027/003</div> <ul style="list-style-type: none"> . . {mounted on rotor hub, e.g. a rotary force generator} <div>2027/004</div> <ul style="list-style-type: none"> . . {using actuators, e.g. active systems} <div>2027/005</div> <ul style="list-style-type: none"> . . {using suspended masses} <div>27/006</div> <ul style="list-style-type: none"> . {Safety devices} <div>27/007</div> <ul style="list-style-type: none"> . . {adapted for detection of blade cracks} <div>27/008</div> <ul style="list-style-type: none"> . {Rotors tracking or balancing devices} <div>27/02</div> <ul style="list-style-type: none"> . Gyroplanes <div>27/021</div> <ul style="list-style-type: none"> . . {Rotor or rotor head construction (for helicopters B64C 27/32)} <div>27/022</div> <ul style="list-style-type: none"> . . . {Devices for folding or adjusting the blades} <div>27/023</div> <ul style="list-style-type: none"> . . . {Construction of the blades; Coating of the blades} <div>27/024</div> <ul style="list-style-type: none"> . . . {Devices for shifting the rotor axis} <div>27/025</div> <ul style="list-style-type: none"> . . . {Rotor drives, in particular for taking off; Combination of autorotation rotors and driven rotors} <div>27/026</div> <ul style="list-style-type: none"> . . . {Devices for converting a fixed wing into an autorotation rotor and viceversa} <div>27/027</div> <ul style="list-style-type: none"> . . {Control devices using other means than the rotor} <div>27/028</div> <ul style="list-style-type: none"> . . {Other constructional elements; Rotor balancing} <div>27/04</div> <ul style="list-style-type: none"> . Helicopters <div>27/06</div> <ul style="list-style-type: none"> . . with single rotor <div>27/08</div> <ul style="list-style-type: none"> . . with two or more rotors <div>27/10</div> <ul style="list-style-type: none"> . . . arranged coaxially <div>27/12</div> <ul style="list-style-type: none"> . . Rotor drives <div>2027/125</div> <ul style="list-style-type: none"> . . . {including toroidal transmissions, e.g. of the CVT type} <div>27/14</div> <ul style="list-style-type: none"> . . . Direct drive between power plant and rotor hub |
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|-----------|--|--------------|--|
| 27/16 | . . . Drive of rotors by means, e.g. propellers, mounted on rotor blades | 2027/7205 | . . . {on each blade individually, e.g. individual blade control [IBC]} |
| 27/18 | the means being jet-reaction apparatus | 2027/7211 | {without flaps} |
| 27/20 | . Rotorcraft characterised by having shrouded rotors, e.g. flying platforms | 2027/7216 | {using one actuator per blade} |
| 27/22 | . Compound rotorcraft, i.e. aircraft using in flight the features of both aeroplane and rotorcraft | 2027/7222 | {using airfoil deformation} |
| 27/24 | . . with rotor blades fixed in flight to act as lifting surfaces | 2027/7227 | {using blowing slots actuated by piezoelectric actuators} |
| 27/26 | . . characterised by provision of fixed wings | 2027/7233 | {using higher-harmonic control [HHC]} |
| 27/28 | . . with forward-propulsion propellers pivotable to act as lifting rotors | 2027/7238 | {by controlling existing swash plate actuators} |
| 27/30 | . . with provision for reducing drag of inoperative rotor | 2027/7244 | {by using dedicated actuators} |
| 27/32 | . Rotors (features common to rotors and propellers B64C 11/00) | 2027/725 | {using jets controlled by piezoelectric actuators} |
| 27/322 | . . {Blade travel limiting devices, e.g. droop stops} | 2027/7255 | {using one or more swash plates} |
| 27/325 | . . {Circulation-control rotors} | 2027/7261 | {with flaps} |
| 27/327 | . . {Retention means relieving the stress from the arm, e.g. tie-bars} | 2027/7266 | {actuated by actuators} |
| 27/33 | . . having flexing arms | 2027/7272 | {of the electro-hydraulic type} |
| 27/35 | . . having elastomeric joints | 2027/7277 | {of the magnetostrictive type} |
| 27/37 | . . having articulated joints (B64C 27/33 , B64C 27/35 take precedence) | 2027/7283 | {of the piezoelectric type} |
| 27/39 | . . . with individually articulated blades, i.e. with flapping or drag hinges | 2027/7288 | {of the memory shape type} |
| 27/41 | . . . with flapping or universal joint, common to the blades | 2027/7294 | {actuated mechanically, e.g. by means of linkages} |
| 27/43 | see-saw type, i.e. two-bladed rotor | 27/78 | . . in association with pitch adjustment of blades of anti-torque rotor |
| 27/45 | . . . with a feathering hinge only | 27/80 | . . for differential adjustment of blade pitch between two or more lifting rotors |
| 27/46 | . . Blades | 27/82 | . characterised by the provision of an auxiliary rotor or fluid-jet device for counter-balancing lifting rotor torque or changing direction of rotorcraft |
| 27/463 | . . . {Blade tips} | 2027/8209 | . . {Electrically driven tail rotors} |
| 27/467 | . . . Aerodynamic features (B64C 27/463 takes precedence) | 2027/8218 | . . {wherein the rotor or the jet axis is inclined with respect to the longitudinal horizontal or vertical plane of the helicopter} |
| 27/473 | . . . Constructional features (B64C 27/463 takes precedence) | 2027/8227 | . . {comprising more than one rotor} |
| 2027/4733 | {Rotor blades substantially made from particular materials} | 2027/8236 | . . {including pusher propellers} |
| 2027/4736 | {from composite materials} | 2027/8245 | . . {using air jets} |
| 27/48 | Root attachment to rotor head | 2027/8254 | . . {Shrouded tail rotors, e.g. "Fenestron" fans} |
| 27/50 | Blades foldable to facilitate stowage of aircraft | 2027/8263 | . . {comprising in addition rudders, tails, fins, or the like} |
| 27/51 | . Damping of blade movements | 2027/8272 | . . . {comprising fins, or movable rudders} |
| 27/52 | . Tilting of rotor bodily relative to fuselage (of see-saw type construction B64C 27/43) | 2027/8281 | . . . {comprising horizontal tail planes} |
| 27/54 | . Mechanisms for controlling blade adjustment or movement relative to rotor head, e.g. lag-lead movement | 2027/829 | . . . {comprising a V-tail units} |
| 27/56 | . . Initiating means, e.g. actuated personally | 29/00 | Aircraft capable of landing or taking-off vertically (attitude, flight direction, or altitude control by jet reaction B64C 15/00; rotorcraft B64C 27/00; air-cushion vehicles B60V) |
| 27/57 | . . . automatic or condition responsive, e.g. responsive to rotor speed, torque or thrust | 29/0008 | . {having its flight directional axis horizontal when grounded} |
| 27/58 | . . Transmitting means | 29/0016 | . . {the lift during taking-off being created by free or ducted propellers or by blowers} |
| 27/59 | . . . mechanical | 29/0025 | . . . {the propellers being fixed relative to the fuselage} |
| 27/605 | including swash plate, spider or cam mechanisms | 29/0033 | . . . {the propellers being tiltable relative to the fuselage} |
| 27/615 | including flaps mounted on blades | 29/0041 | . . {the lift during taking-off being created by jet motors} |
| 27/625 | including rotating masses or servo rotors | 29/005 | . . . {the motors being fixed relative to the fuselage} |
| 27/635 | specially for controlling lag-lead movements of blades | 29/0058 | . . . {with vertical jet} |
| 27/64 | using fluid pressure | 29/0066 | . . . {with horizontal jet and jet deflector} |
| 27/68 | using electrical energy | 29/0075 | . . . {the motors being tiltable relative to the fuselage} |
| 27/72 | . . Means acting on blades | | |

- 29/0083 . . {the lift during taking-off being created by several motors of different type}
- 29/0091 . {Accessories not provided for elsewhere}
- 29/02 . having its flight directional axis vertical when grounded
- 29/04 . . characterised by jet-reaction propulsion
- 30/00** **Supersonic-type aircraft**
- 31/00** **Aircraft intended to be sustained without power plant; Powered hang-glider-type aircraft; Microlight-type aircraft**
- 31/02 . Gliders, e.g. sailplanes ([hang-gliders B64C 31/028](#))
- 31/024 . . with auxiliary power plant
- 31/028 . Hang-glider-type aircraft; Microlight-type aircraft
- 31/0285 . . {Safety devices}
- 31/032 . . having delta shaped wing
- 31/036 . . having parachute-type wing ([parachutes B64D 17/00](#))
- 31/04 . Man-powered aircraft ([ornithopters B64C 33/00](#))
- 31/06 . Kites ([hang-gliders B64C 31/028](#); toy aspects [A63H 27/08](#); towed targets [F41J](#); for propelling water sports boards [B63H 8/10](#); for propelling vessels [B63H 9/069](#))

WARNING

Group [B64C 31/06](#) is impacted by reclassification into groups [B63H 8/10](#) - [B63H 8/18](#), [B63H 8/23](#), [B63H 8/25](#), [B63H 8/50](#) - [B63H 8/70](#) and [B63H 9/068](#) - [B63H 9/072](#).

All groups listed in this Warning should be considered in order to perform a complete search.

- 2031/065 . . {of inflatable wing type}

33/00 **Ornithopters**

- 33/02 . Wings; Actuating mechanisms therefor
- 33/025 . . {the entire wing moving either up or down}

35/00 **Flying-boats; Seaplanes ([alighting gear B64C 25/00](#))**

- 35/001 . {with means for increasing stability on the water}
- 35/002 . . {using adjustable auxiliary floats}
- 35/003 . . {using auxiliary floats at the wing tips}
- 35/005 . {with propellers, rudders or brakes acting in the water}
- 35/006 . {with lift generating devices}
- 35/007 . {Specific control surfaces therefor}
- 35/008 . {Amphibious sea planes}

37/00 **Convertible aircraft ([vehicles capable of travelling in or on different media B60F](#))**

- 37/02 . Flying units formed by separate aircraft ([towing, air-refuelling, or aircraft-carrying aircraft B64D](#))

39/00 **Aircraft not otherwise provided for****WARNING**

Group [B64C 39/00](#) is impacted by reclassification into group [B64C 39/029](#).

Groups [B64C 39/00](#) and [B64C 39/029](#) should be considered in order to perform a complete search.

- 39/001 . {Flying saucers}

- 39/003 . {with wings, paddle wheels, bladed wheels, moving or rotating in relation to the fuselage ([rotorcraft B64C 27/00](#), [ornithopters B64C 33/00](#))}
- 39/005 . . {about a horizontal transversal axis}
- 39/006 . . {about a vertical axis}
- 39/008 . . {about a longitudinal axis}
- 39/02 . characterised by special use
- 39/022 . . {Tethered aircraft}
- 39/024 . . {of the remote controlled vehicle type, i.e. RPV}
- 39/026 . . {for use as personal propulsion unit}

WARNING

Group [B64C 39/026](#) is impacted by reclassification into group [B63B 34/15](#).

Groups [B64C 39/026](#) and [B63B 34/15](#) should be considered in order to perform a complete search.

- 39/028 . . {Micro-sized aircraft}
- 39/029 . {Asymmetrical aircraft}

WARNING

Group [B64C 39/029](#) is incomplete pending reclassification of documents from groups [B64C 1/0009](#), [B64C 2001/0045](#), [B64C 3/10](#), [B64C 3/16](#), [B64C 7/00](#), and [B64C 39/00](#).

All groups should be considered in order to perform a complete search.

- 39/04 . having multiple fuselages or tail booms
- 39/06 . having disc- or ring-shaped wings {([B64C 39/001 takes precedence](#))}
- 39/062 . . {having annular wings}
- 39/064 . . . {with radial airflow}
- 39/066 . . {having channel wings}
- 39/068 . . {having multiple wings joined at the tips}
- 39/08 . having multiple wings {([B64C 39/06 takes precedence](#))}
- 39/10 . All-wing aircraft {([B64C 39/001 takes precedence](#))}
- 2039/105 . {of blended wing body type}
- 39/12 . Canard-type aircraft

2201/00 **Unmanned aerial vehicles; Equipment therefor**

- 2201/02 . characterized by type of aircraft
- 2201/021 . . Airplanes, i.e. having wings and tail planes
- 2201/022 . . Balloons, blimps or airships
- 2201/024 . . Helicopters, or autogiros
- 2201/025 . . Ornithopters, i.e. generating lift and propulsion by flapping wings or insect like means
- 2201/027 . . Flying platforms
- 2201/028 . . of all-wing types
- 2201/04 . characterised by type of power plant
- 2201/042 . . by electric motors; Electric power sources therefor, e.g. fuel cells, solar panels or batteries
- 2201/044 . . by internal combustion engines, e.g. oscillating piston or rotary piston engines
- 2201/046 . . by rocket engines, ramjets, or pulse-reactors
- 2201/048 . . by jet turbines, or turbofans
- 2201/06 . characterised by in-flight supply of energy
- 2201/063 . . by refueling
- 2201/066 . . by recharging of batteries, e.g. by induction
- 2201/08 . characterised by the launching method

- 2201/082 . . Released from other aircraft
- 2201/084 . . using catapults
- 2201/086 . . by taking-off horizontally by own power, e.g. from a runway
- 2201/088 . . Vertical take-off using special means ([for helicopters B64C 2201/024](#); [for balloons B64C 2201/022](#))
- 2201/10 . . characterised by the lift producing means
- 2201/101 . . Lifting aerostatically, e.g. using lighter-than-air gases in chambers
- 2201/102 . . Deployable wings, e.g. foldable or morphing wings
- 2201/104 . . Fixed wings
- 2201/105 . . Inflatable wings
- 2201/107 . . Parachutes; Parasails; Kites; Membranes
- 2201/108 . . using rotors, or propellers
- 2201/12 . . adapted for particular use
- 2201/121 . . for dropping bombs; for electronic warfare; Flying bombs
- 2201/122 . . as communication relays, e.g. high altitude platforms
- 2201/123 . . for imaging, or topography
- 2201/125 . . for meteorology
- 2201/126 . . adapted for performing different kinds of missions, e.g. multipurpose use
- 2201/127 . . for photography, or video recording, e.g. by using cameras
- 2201/128 . . for transporting goods other than bombs
- 2201/14 . . characterised by flight control
- 2201/141 . . autonomous, i.e. by navigating independently from ground or air stations, e.g. by using inertial navigation systems [INS]
- 2201/143 . . . adapted for flying in formations
- 2201/145 . . . using satellite radio beacon positioning systems, e.g. GPS
- 2201/146 . . Remote controls
- 2201/148 . . . using tethers for connecting to ground station
- 2201/16 . . characterised by type of propulsion unit
- 2201/162 . . using ducted fans or propellers
- 2201/165 . . using unducted propellers
- 2201/167 . . using rockets, ramjets, pulse jets, plasma, or the like
- 2201/18 . . characterised by landing method
- 2201/182 . . by being caught in mid-air, or next to the ground, e.g. using a net
- 2201/185 . . by deploying parachutes, or the like
- 2201/187 . . by landing horizontally, e.g. on a runway
- 2201/20 . . Methods for transport, or storage of unmanned aerial vehicles
- 2201/201 . . in containers
- 2201/203 . . in rucksacks, or bags to be carried by persons
- 2201/205 . . by waterborne vehicles, e.g. ships or submarines or by hovercraft
- 2201/206 . . by airborne vehicles, e.g. airplanes or helicopters
- 2201/208 . . by landborne vehicles, e.g. trucks, lorries, tanks or cars
- 2201/22 . . having stealth characteristics
- 2203/00 Flying model aircraft, flying toy aircraft**
- 2211/00 Modular constructions of airplanes or helicopters**
- 2220/00 Active noise reduction systems**
- 2230/00 Boundary layer controls**
- 2230/02 . . by using acoustic waves generated by transducers
- 2230/04 . . by actively generating fluid flow
- 2230/06 . . by explicitly adjusting fluid flow, e.g. by using valves, variable aperture or slot areas, variable pump action or variable fluid pressure
- 2230/08 . . by influencing fluid flow by means of surface cavities, i.e. net fluid flow is null
- 2230/10 . . by influencing fluid flow by heating using other means than combustion
- 2230/12 . . by using electromagnetic tiles, fluid ionizers, static charges or plasma
- 2230/14 . . achieving noise reductions
- 2230/16 . . by blowing other fluids over the surface than air, e.g. He, H, O₂ or exhaust gases
- 2230/18 . . by using small jets that make the fluid flow oscillate
- 2230/20 . . by passively inducing fluid flow, e.g. by means of a pressure difference between both ends of a slot or duct
- 2230/22 . . by using a surface having multiple apertures of relatively small openings other than slots
- 2230/24 . . by using passive resonance cavities, e.g. without transducers
- 2230/26 . . by using rib lets or hydrophobic surfaces
- 2230/28 . . at propeller or rotor blades