

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}	1/406	. . . {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)}
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)	3/00	Wings (stabilising surfaces B64C 5/00 ; ornithopter wings B64C 33/02)
1/1407	. . {Doors; surrounding frames}	3/10	. Shape of wings
1/1415	. . . {Cargo doors, e.g. incorporating ramps}		WARNING
1/1423	. . . {Passenger doors}		Group B64C 3/10 is impacted by reclassification into group B64C 39/029 .
1/143	. . . . {of the plug type}		Groups B64C 3/10 and B64C 39/029 should be considered in order to perform a complete search.
1/1438	. . . . {of the sliding type}		
1/1446	. . . {Inspection hatches (for engine cowls B64D 29/08)}		
1/1453	. . . {Drain masts}	3/14	. . Aerofoil profile
1/1461	. . . {Structures of doors or surrounding frames}	3/141	. . . {Circulation Control Airfoils}
1/1469	. . . {Doors between cockpit and cabin}	2003/142	. . . {with variable camber along the airfoil chord}
1/1476	. . {Canopies; Windscreens or similar transparent elements}	2003/143	. . . {comprising interior channels}
1/1484	. . . {Windows (B64C 1/1492 takes precedence)}	2003/144	. . . {including a flat surface on either the extrados or intrados}
1/1492	. . . {Structure and mounting of the transparent elements in the window or windscreen}	2003/145	. . . {comprising 'Gurney' flaps}
1/16	. specially adapted for mounting power plant	2003/146	. . . {comprising leading edges of particular shape}
1/18	. Floors	2003/147	. . . {comprising trailing edges of particular shape}
1/20	. . specially adapted for freight	2003/148	. . . {comprising protuberances, e.g. for modifying boundary layer flow}
1/22	. Other structures integral with fuselages to facilitate loading {, e.g. cargo bays, cranes (cargo door type ramps B64C 1/1415)}	2003/149	. . . {for supercritical or transonic flow}
1/24	. Steps mounted on, and retractable within, fuselages (readily removable B64D 9/00)	3/16	. . Frontal aspect
1/26	. Attaching the wing or tail units or stabilising surfaces		WARNING
1/28	. Parts of fuselage relatively movable to improve pilots view		Group B64C 3/16 is impacted by reclassification into group B64C 39/029 .
1/30	. Parts of fuselage relatively movable to reduce overall size for storage		Groups B64C 3/16 and B64C 39/029 should be considered in order to perform a complete search.
1/32	. Severable or jettisonable parts of fuselage facilitating emergency escape (ejector seats B64D 25/10)	3/18	. Spars; Ribs; Stringers (attaching wing unit to fuselage B64C 1/26)
1/34	. comprising inflatable structural components (connection of valves to inflatable elastic bodies B60C 29/00)	3/182	. . {Stringers, longerons}
1/36	. adapted to receive antennas or radomes (antennas or radomes per se H01Q)	3/185	. . {Spars}
1/38	. Constructions adapted to reduce effects of aerodynamic or other external heating {(cooling structural parts of aircrafts with air flow B64D 13/006)}	3/187	. . {Ribs}
1/40	. Sound or heat insulation {, e.g. using insulation blankets (insulating elements for vehicles, in general B60R 13/08)}	3/20	. Integral or sandwich constructions (layered products or sandwich constructions in general B32B)
1/403	. . {Arrangement of fasteners specially adapted therefor, e.g. of clips (in vehicles in general B60R 13/0206)}	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}

<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