

CPC COOPERATIVE PATENT CLASSIFICATION

B PERFORMING OPERATIONS; TRANSPORTING

(NOTES omitted)

TRANSPORTING

B60 VEHICLES IN GENERAL

(NOTE omitted)

B60B VEHICLE WHEELS (making wheels or wheel parts by rolling [B21H 1/00](#), by forging, hammering or pressing [B21K 1/28](#)); CASTORS; AXLES FOR WHEELS OR CASTORS; INCREASING WHEEL ADHESION

NOTE

Attention is drawn to the Explanatory Note following the class title ([B60](#))

WARNING

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.

Wheels (wheels for roller skates [A63C 17/22](#); making wheels or wheel parts [B21D 53/26](#); by rolling [B21H 1/00](#); by forging, hammering, or pressing [B21K 1/28](#))

- | | | | |
|-------------|---|-------------|---|
| | | 1/045 | {characterised by their specific shape} |
| | | 1/046 | {characterised by adaptations of the nipple for tightening tools} |
| | | 1/047 | {the nipple comprising sealing means} |
| | | 1/048 | {by the use of screws} |
| | | 1/06 | . Wheels with compression spokes (wheels of high resiliency B60B 9/00) |
| | | 1/08 | . . formed by casting |
| | | 1/10 | . . fabricated by sheet metal (B60B 1/12 , B60B 3/08 take precedence) |
| | | 1/12 | . . with tubular spokes (B60B 1/08 takes precedence) |
| | | 1/14 | . . Attaching spokes to rim or hub |
| | | 3/00 | Disc wheels, i.e. wheels with load-supporting disc body (non-metallic B60B 5/00 ; wheel cover discs B60B 7/00 {; disc wheels comprising rail-engaging elements B60B 17/0006 }) |
| | | 3/001 | . {Lightweight wheels, e.g. for strollers or toys} |
| | | 3/002 | . {characterised by the shape of the disc} |
| | | 3/004 | . . {in the hub section} |
| | | 3/005 | . . {in the section adjacent to rim} |
| | | 3/007 | . . {in the intermediate section} |
| | | 3/008 | . {by the form of wheel bolt mounting section} |
| | | 3/02 | . with a single disc body integral with rim |
| | | 3/04 | . with a single disc body not integral with rim {, i.e. disc body and rim being manufactured independently and then permanently attached to each other in a second step, e.g. by welding} |
| | | 3/041 | . . {characterised by the attachment of rim to wheel disc} |
| | | 3/042 | . . . {characterised by circumferential position of attachment means} |
| | | 3/044 | . . . {characterised by cross-sectional details of the attachment, e.g. the profile} |
| | | 3/045 | . . . {characterised by the attachment portions} |
| | | 3/047 | {comprising specific torque transmitting means} |
| 1/00 | Spoked wheels; Spokes thereof (non-metallic B60B 5/00 {; spoked wheels comprising rail-engaging elements B60B 17/001 ; making wheel spokes B21F 39/00 }) | | |
| 1/003 | . {specially adapted for bicycles (B60B 1/041 takes precedence)} | | |
| 1/006 | . {specially adapted for light-weight wheels, e.g. of strollers or wheel-chairs (B60B 1/003 takes precedence)} | | |
| 1/02 | . Wheels with wire or other tension spokes | | |
| 1/0207 | . . {characterised by non-standard number of spokes, i.e. less than 12 or more than 32 spokes} | | |
| 1/0215 | . . {characterised by specific grouping of spokes} | | |
| 1/0223 | . . . {the dominant aspect being the spoke arrangement pattern} | | |
| 1/023 | {multiple exclusively parallel spokes arranged in a group} | | |
| 1/0238 | . . . {the dominant aspect being the number of spokes per group} | | |
| 1/0246 | . . {characterised by cross-section of the spoke, e.g. polygon or elliptic shape} | | |
| 1/0253 | . . {the spoke being hollow} | | |
| 1/0261 | . . {characterised by spoke form} | | |
| 1/0269 | . . . {the spoke being curved or deformed over substantial part of length} | | |
| 1/0276 | . . . {the spoke being crooked in the middle and having double length} | | |
| 1/0284 | . . . {the spoke being threaded at both ends} | | |
| 1/0292 | . . . {the spoke being bent at both ends} | | |
| 1/04 | . . Attaching spokes to rim or hub | | |
| 1/041 | . . . {of bicycle wheels (bicycle rims characterised by means for attaching spokes B60B 21/062 }) | | |
| 1/042 | . . . {Attaching spokes to hub} | | |
| 1/043 | . . . {Attaching spokes to rim} | | |
| 1/044 | {by the use of spoke nipples} | | |

- 3/048 . . {the rim being rotatably mounted to the wheel disc}
- 3/06 . formed by casting
- 3/08 . with disc body formed by two or more axially spaced discs {(comprising rail-engaging elements formed by two or more axially spaced discs [B60B 17/0013](#))}
- 3/082 . . {especially for light-weight wheels}
- 3/085 . . {Discs having no mutual contact}
- 3/087 . . {Discs having several mutual contact regions}
- 3/10 . apertured to simulate spoked wheels
- 3/12 . Means of reinforcing disc bodies
- 3/14 . Attaching disc body to hub ([resiliently B60B 9/00](#); [attaching rim to wheel body B60B 23/00](#)) {; Wheel adapters}
 - 3/142 . . {by central locking nut}
 - 3/145 . . {using washers or distance bushes}
 - 3/147 . . {using wheel adapters}
 - 3/16 . . by bolts or the like
 - 3/165 . . . {with locking devices for the fixing means, e.g. screw or nut covers}
 - 3/18 . . by circlips or the like
- 5/00** **Wheels, spokes, disc bodies, rims, hubs, wholly or predominantly made of non-metallic material** ([wheel cover discs B60B 7/00](#); [wheels of high resiliency B60B 9/00](#) {; [wheel bodies comprising rail-engaging elements characterised by use of non-metallic material B60B 17/0003](#))}
 - 5/02 . made of synthetic material
 - 5/04 . made of wood
- 7/00** **Wheel cover discs, rings, or the like, for ornamenting, protecting {, venting,} or obscuring, wholly or in part, the wheel body, rim, hub, or tyre sidewall {, e.g. wheel cover discs, wheel cover discs with cooling fins** ([wheels with cooling fins not provided on the wheel cover disc B60B 19/10](#); [apparatus or tools for removing or attaching cover discs hub caps or the like B60B 31/06](#))}
 - 7/0006 . {for cycle wheels or similar}
 - 7/0013 . {Hub caps}
 - 7/002 . . {being of the ventilated type}
 - 7/0026 . {characterised by the surface}
 - 7/0033 . . {the dominant aspect being the surface appearance}
 - 7/004 . . . {the surface being painted}
 - 7/0046 . . . {the surface being plated or coated}
 - 7/0053 . . . {the surface being decorated}
 - 7/006 . . . {the surface being reflective or including lighting}
 - 7/0066 . . {the dominant aspect being the surface structure}
 - 7/0073 . . . {being completely closed, i.e. having no cooling openings for the brakes}
 - 7/008 . . . {having decorative holes or openings, i.e. openings going beyond mere cooling openings}
 - 7/0086 . . . {having cooling fins}
 - 7/0093 . {being reinforced against thermal deformation}
 - 7/01 . Rings specially adapted for covering only the wheel rim or the tyre sidewall, e.g. removable tyre sidewall trim rings
 - 7/02 . made essentially in one part ({[B60B 7/0006](#),} [B60B 7/01](#) take precedence)
- 7/04 . built-up of several main parts ([B60B 7/01](#), [B60B 7/20](#) take precedence)
- 7/06 . Fastening arrangements therefor ([B60B 7/01](#), [B60B 7/20](#) take precedence)
- 7/061 . . {characterised by the part of the wheels to which the discs, rings or the like are mounted}
 - 7/063 . . . {to the rim}
 - 7/065 . . . {to the disc}
 - 7/066 . . . {to the hub}
 - 7/068 . . . {to the wheel bolts or wheel nuts}
- 7/08 . . having gripping elements consisting of formations integral with the cover
- 7/10 . . comprising a plurality of spaced spring clips individually mounted on the cover, e.g. riveted, welded or readily releasable
 - 7/105 . . . {the spring clip mounted on the rim}
- 7/12 . . comprising an annular spring or gripping element mounted on the cover ([B60B 7/08](#) takes precedence)
- 7/14 . . comprising screw-threaded means
- 7/16 . Anti-theft devices
- 7/18 . simulating spoked or wire wheel
- 7/20 . having an element mounted for rotation independently of wheel rotation
- 9/00** **Wheels of high resiliency {, e.g. with conical interacting pressure-surfaces** ([resilient wheels comprising rail-engaging elements B60B 17/0027](#))}
 - 9/005 . {Comprising a resilient hub ([hubs per se B60B 27/00](#))}
 - 9/02 . using springs {[resiliently mounted bicycle rims](#)} ([wheels comprising resilient spokes B60B 9/26](#))
 - 9/04 . . in leaf form
 - 9/06 . . in helical form
 - 9/08 . . in flat coiled form
 - 9/10 . . of rubber or the like
 - 9/12 . . . in the form of sleeves or rings concentric with the wheel axis
 - 9/14 . . . with means limiting relative lateral movements between hub and remainder of wheel
 - 9/16 . . . modified to ensure electric conductivity
 - 9/18 . using fluid ([within spokes B60B 9/26](#))
 - 9/20 . . in rings concentric with wheel axis
 - 9/22 . . . inflatable
 - 9/24 . . with pistons and cylinders
 - 9/26 . comprising resilient spokes
 - 9/28 . . with telescopic action
- 11/00** **Units comprising multiple wheels arranged side by side; Wheels having more than one rim or capable of carrying more than one tyre**
 - 11/02 . Units of separate wheels mounted for independent or coupled rotation
 - 11/04 . Wheels with a rim capable of carrying more than one tyre
 - 11/06 . Wheels with more than one rim mounted on a single wheel body
 - 11/08 . Arrangements of balancing mechanisms enabling a uniform distribution of load to tyres
 - 11/10 . Emergency wheels ([collapsible tyres B60C 3/08](#); [tyres characterised by means enabling restricted operation in damaged or deflated condition B60C 17/00](#))

15/00 **Wheels or wheel attachments designed for increasing traction (vehicle tires [B60C](#); non-skid devices temporarily attachable to resilient tires or resiliently-tired wheels [B60C](#))**

- 15/02 . . Wheels with spade lugs
- 15/021 . . . {made of resilient material}
- 15/023 . . . {being of the broad form type}
- 15/025 {with non-cylindrical shape}
- 15/026 . . . {characterised by mud deposit prevention}
- 15/028 . . . {characterised by active rotation of the lugs}
- 15/04 . . with resiliently-mounted spade lugs
- 15/06 . . with pivotally-mounted spade lugs
- 15/08 . . with spade lugs axially displaced relatively to the tread surface of the tyre
- 15/10 . . with radially-adjustable spade lugs; Control mechanisms therefor
- 15/12 involving cams or eccentric hoops
- 15/14 involving an axially-displaceable cone
- 15/16 involving gearing, e.g. gear pinions acting upon threaded shafts on the spade lugs
- 15/18 . . Wheels with ground-engaging plate-like shoes
- 15/20 . . with resiliently-mounted shoes, e.g. on a spider
- 15/22 . . connected by links to the hub
- 15/24 . . Tread bands or rings for fairing lugs when travelling on the road
- 15/26 . . Auxiliary wheels or rings with traction-increasing surface attachable to the main wheel body
- 15/263 . . . {Traction increasing surface being located axially beside tyre}
- 15/266 . . . {Traction increasing surface being located radially outside tyre circumferential surface}
- 15/28 . . Wheel-ballasting weights; Their attachment

17/00 **Wheels characterised by rail-engaging elements ({wheel-axle combinations [B60B 37/00](#);} of model railways [A63H 19/22](#))**

- 17/0003 . . {Wheel bodies characterised by use of non-metallic material ([B60B 17/0034](#) takes precedence)}
- 17/0006 . . {Construction of wheel bodies, e.g. disc wheels ([B60B 17/0003](#) takes precedence)}
- 17/001 . . . {Spoked wheels; Spokes thereof}
- 17/0013 . . . {formed by two or more axially spaced discs}
- 17/0017 {with insonorisation means}
- 17/002 . . . {with counter-balance}
- 17/0024 . . . {with noise reducing means ([B60B 17/0017](#) takes precedence)}
- 17/0027 . . {Resilient wheels, e.g. resilient hubs ([B60B 17/02](#) takes precedence)}
- 17/0031 . . . {using springs}
- 17/0034 {of rubber or other non-metallic material}
- 17/0037 {of circular or elliptical cross section}
- 17/0041 {of substantially rectangular cross section}
- 17/0044 {single element arranged in V-form}
- 17/0048 {pair of elements arranged in V-form}
- 17/0051 . . . {using fluid}
- 17/0055 . . {with non-elastic tyres (e.g. of particular profile or composition)}
- 17/0058 . . . {characterised by their fixing to wheel bodies}
- 17/0062 . . . {having teeth or protrusions on the circumference of the wheel}
- 17/0065 . . {Flange details}
- 17/0068 . . . {the flange being provided on a single side}
- 17/0072 . . . {the flange being provided on both sides}

- 17/0075 . . . {the flange being movable, for adaptation to variable rail or track widths}
- 17/0079 . . . {the flange having a guide wheel}
- 17/0082 . . . {Wheels designed to interact with a particular rail profile}
- 17/0086 . . . {H-type rail profiles, i.e. the wheels are arranged between upper and lower rail extensions}
- 17/0089 . . . {Circular rail profiles}
- 17/0093 . . . {Rectangular rail profiles}
- 17/0096 . . . {Triangular rail profiles}
- 17/02 . . with elastic tyres

19/00 **Wheels not otherwise provided for or having characteristics specified in one of the subgroups of this group**

- 19/003 . . {Multidirectional wheels}
- 19/006 . . {Magnetic wheels}
- 19/02 . . convertible, e.g. from road wheel to rail wheel; Wheels specially designed for alternative use on road and rail
- 19/04 . . expandible
- 19/06 . . with compartments for fluid, packing or loading material; Buoyant wheels
- 19/08 . . with lubricating passages, channels, or reservoirs
- 19/10 . . with cooling fins
- 19/12 . . Roller-type wheels ([B60B 19/06](#) takes precedence)
- 19/125 . . . {with helical projections on radial outer surface translating rotation of wheel into movement along the direction of the wheel axle}
- 19/14 . . Ball-type wheels ([B60B 19/06](#) takes precedence)

Rims; Hubs

- 21/00** **Rims (non-metallic [B60B 5/00](#); of high resiliency [B60B 9/00](#); capable of carrying more than one tyre [B60B 11/04](#); multiple rims on a single wheel body [B60B 11/06](#); of multi-part type [B60B 25/00](#); metal tyres [B60C](#))**
- 21/02 . . characterised by transverse section
 - 21/021 . . . {with inwardly directed flanges, i.e. the tyre-seat being reversed}
 - 21/023 . . . {the transverse section being non-symmetrical}
 - 21/025 . . . {the transverse section being hollow}
 - 21/026 . . . {the shape of rim well}
 - 21/028 . . . {the shape of hump}
 - 21/04 . . with substantially radial flanges ([with rail-engaging flanges \[B60B 17/00\]\(#\)](#))([B60B 21/021](#) takes precedence)}
 - 21/06 . . characterised by means for attaching spokes {, i.e. spoke seats}
 - 21/062 . . . {for bicycles}
 - 21/064 . . . {characterised by shape of spoke mounting holes, e.g. elliptical or triangular}
 - 21/066 . . . {the spoke mounting means being located on a flange oriented radially and formed on the radially inner side of the rim well}
 - 21/068 . . . {the spoke seat comprising sealing means, e.g. for tubeless racing bike tyres}
 - 21/08 . . characterised by having braking surfaces
 - 21/10 . . characterised by the form of tyre-seat or flange, e.g. corrugated ([B60B 21/02](#) takes precedence)
 - 21/102 . . . {the shape of bead seats}
 - 21/104 . . . {the shape of flanges}
 - 21/106 {the shape of flange end-sections}

- 21/108 . . {the surface of bead seats}
- 21/12 . Appurtenances, e.g. lining bands
- 21/125 . . {Bead clamping elements}
- 23/00 Attaching rim to wheel body (attaching spokes to rim [B60B 1/04](#), [B60B 1/14](#); attaching rims resiliently to wheel body [B60B 9/00](#) {; devices for fastening or securing constructional elements or machine parts together [F16B](#)})**
- NOTE**
- Group [B60B 23/12](#) takes precedence over groups [B60B 23/02](#) - [B60B 23/10](#)
- 23/02 . by split or other expansible ring devices
- 23/04 . by bayonet joint, screw-thread, or like attachments
- 23/06 . by screws, bolts, pins, or clips
- 23/08 . . arranged radially
- 23/10 . . arranged axially
- 23/12 . by devices arranged to permit variation of axial position of rim relative to wheel body for track width adjustment
- 25/00 Rims built-up of several main parts {; Locking means for the rim parts}(tools for assembling divided rims [B60B 31/04](#))**
- 25/002 . {Rims split in circumferential direction}
- 25/004 . . {one rim part comprising the wheel disc}
- 25/006 . . {Rims split symmetrically}
- 25/008 . . {comprising spacer means}
- 25/02 . Segmented rims, e.g. with segments arranged in sections; Connecting equipment, e.g. hinges; Insertable flange rings therefor
- 25/04 . Rims with dismountable flange rings, seat rings, or lock rings
- 25/045 . . {on both sides}
- 25/06 . . Split flange rings, e.g. transversely split; Connecting equipment for overlapping the slot
- 25/08 . . Continuous flange rings; Arrangement of recesses enabling the flange rings to be slipped over the rim body
- 25/10 . . Seat rings for the tyre bead part, e.g. split
- 25/12 . . . with integral flange part
- 25/14 . . Locking means for flange rings or seat rings
- 25/16 . . . Arrangement of bayonet catches
- 25/18 . . . Arrangement of split rings
- 25/20 . . . Arrangement of screws, bolts, or shouldered pins
- 25/22 . Other apurtenances, e.g. for sealing the component parts enabling the use of tubeless tyres
- 27/00 Hubs (non-metallic [B60B 5/00](#); of high resiliency [B60B 9/00](#))**
- 27/0005 . {with ball bearings}
- 27/001 . {with roller-bearings}
- 27/0015 . {for driven wheels}
- 27/0021 . . {characterised by torque transmission means from drive axle}
- 27/0026 . . . {of the radial type, e.g. splined key}
- 27/0031 . . . {of the axial type, e.g. front teeth}
- 27/0036 . . {comprising homokinetic joints}
- 27/0042 . . . {characterised by the fixation of the homokinetic joint to the hub}
- 27/0047 . {characterised by functional integration of other elements}
- 27/0052 . . {the element being a brake disc}
- 27/0057 . . {the element being a brake drum}
- 27/0063 . . {the element being a brake caliper mount}
- 27/0068 . . {the element being a sensor}
- 27/0073 . {characterised by sealing means}
- 27/0078 . {characterised by the fixation of bearings}
- 27/0084 . . {caulking to fix inner race}
- 27/0089 . . {caulking to fix outer race}
- 27/0094 . {one or more of the bearing races are formed by the hub}
- 27/02 . adapted to be rotatably arranged on axle
- 27/023 . . {specially adapted for bicycles}
- 27/026 . . . {comprising quick release devices}
- 27/04 . . housing driving means, e.g. sprockets
- 27/042 . . . {comprising a rotational dampers}
- 27/045 . . . {comprising a spoke protectors}
- 27/047 . . . {comprising a freewheel mechanisms}
- 27/06 . adapted to be fixed on axle
- 27/065 . . {characterised by the fixation of the hub to the axle}
- Apparatus or tools for mounting wheels or parts thereof (hand tools in general [B25](#); tools for mounting tyres [B60C 25/00](#))**
- 29/00 Apparatus or tools for mounting or dismounting wheels {(mounting of wheels at assembly lines [B62D 65/12](#))}**
- 29/001 . {comprising lifting or aligning means ([B60B 29/002](#) takes precedence)}
- 29/002 . {provided with a dolly}
- 29/003 . {Wrenches, e.g. of the ratchet type ([B60B 29/001](#) takes precedence; wrenches *per se* [B25B 13/00](#))}
- 29/004 . . {for dual wheels}
- 29/005 . . {hand-driven operating with multiplied forces ([B60B 29/004](#) takes precedence; hand-driven gear-operated wrenches *per se* [B25B 17/00](#), with torque amplification [B25B 17/02](#))}
- 29/006 . . {with electric or pneumatic drive (power-driven nut setting or loosening tool *per se* [B25B 21/00](#))}
- 29/007 . . {Supports for wrenches ([B60B 29/005](#), [B60B 29/006](#) take precedence)}
- 29/008 . {Wheel pullers; tools for axial movement of wheels (adjustable axle units for varying track [B60B 35/10](#))}
- 30/00 Means for holding wheels or parts thereof (spare wheel stowing, holding or mounting arrangements on vehicles [B62D 43/00](#))**
- 30/02 . engaging the tyre, e.g. the tyre being mounted on the wheel rim
- 30/04 . . the tyre not being mounted on a rim, i.e. holders or supports for tyres alone
- 30/06 . engaging the wheel body, e.g. the rim
- 30/08 . . the central part of the wheel body
- 30/10 . characterised by being provided on a dolly
- 31/00 Apparatus or tools for assembling or disassembling wheels**
- 31/005 . {especially for spoked wheels}
- 31/02 . for tightening or straightening wire spokes *in situ*; for extracting spokes from wheels
- 31/04 . for assembling divided rims
- 31/06 . for removing or attaching cover discs, hub caps, or the like

- 33/00 Castors in general; {Anti-clogging castors}(castors for large containers [B65D 90/18](#))**
- 33/0002 . {assembling to the object, e.g. furniture}
 - 33/0005 . . {characterised by mounting method}
 - 33/0007 . . . {by screwing}
 - 33/001 . . . {by snapping, clicking or latching in}
 - 33/0013 . . . {by straps, bands or similar}
 - 33/0015 . . {characterised by adaptations made to castor}
 - 33/0018 . . . {in the form of a flat mounting plate}
 - 33/0021 . . . {in the form of a mounting pin}
 - 33/0023 . . . {in the form of specific adaptations to the form of the object}
 - 33/0026 . . {characterised by adaptations made to the object}
 - 33/0028 . {Construction of wheels; methods of assembling on axle}
 - 33/0036 . {characterised by type of wheels}
 - 33/0039 . . {Single wheels}
 - 33/0042 . . {Double or twin wheels}
 - 33/0044 . . {Roller type wheels, i.e. extra wide wheels}
 - 33/0047 . {characterised by details of the rolling axle}
 - 33/0049 . . {the rolling axle being horizontal}
 - 33/0052 . . {the rolling axle being inclined}
 - 33/0055 . . {the rolling axle intersects swivel axis}
 - 33/0057 . . {the rolling axle being offset from swivel axis}
 - 33/006 . {characterised by details of the swivel mechanism}
 - 33/0063 . . {no swivelling action, i.e. no real caster}
 - 33/0065 . . {characterised by details of the swivel axis}
 - 33/0068 . . . {the swivel axis being vertical}
 - 33/0071 . . . {the swivel axis being inclined}
 - 33/0073 . . . {the swivel axis being symmetrical to wheel or wheels}
 - 33/0076 . . . {the swivel axis being offset laterally from wheel center plane}
 - 33/0078 . {characterised by details of the wheel braking mechanism}
 - 33/0081 . . {acting on tyre tread}
 - 33/0084 . . {acting on axle end}
 - 33/0086 . . {acting on rim or side portion of tyre}
 - 33/0089 . . {acting on the floor}
 - 33/0092 . . {actuated remotely, e.g. by cable or electrically}
 - 33/0094 . . {actuated automatically}
 - 33/0097 . . {acting permanently, e.g. for increased security on low friction surfaces}
 - 33/02 . with disengageable swivel action {, i.e. comprising a swivel locking mechanism}
 - 33/021 . . {combined with braking of castor wheel}
 - 33/023 . . {by using friction}
 - 33/025 . . {by using form-fit, e.g. front teeth}
 - 33/026 . . {being actuated remotely, e.g. by cable or electrically}
 - 33/028 . . {being actuated automatically}
 - 33/04 . adjustable {, e.g. in height; linearly shifting castors}
 - 33/045 . . {mounted resiliently, by means of dampers}
 - 33/06 . . mounted retractably
 - 33/063 . . . {by linear movement parallel to swivel axis}
 - 33/066 . . . {by use of a hinge and lever mechanism to swing wheel upwards relative to wheel mount}
 - 33/08 . Ball castors {([B60B 33/0028](#) takes precedence)}
- 35/00 Axle units; Parts thereof (steerable vehicle stub axles [B62D](#)); Arrangements for lubrication of axles}**
- 35/001 . {Axles of the portal type, i.e. axles designed for higher ground clearance}
 - 35/002 . {Axles of the low floor type, e.g. for low-floor city busses}
 - 35/003 . {Steerable axles}
 - 35/004 . {Mounting arrangements for axles}
 - 35/005 . . {with adaptations at chassis structure}
 - 35/006 . . {with mounting plates or consoles fitted to axles}
 - 35/007 . . . {for mounting suspension elements to axles}
 - 35/008 . . . {for mounting air suspension elements to axles}
 - 35/009 . {adapted for tiltable wheels}
 - 35/02 . Dead axles, i.e. not transmitting torque
 - 35/025 . . {the wheels being removable}
 - 35/04 . . straight
 - 35/06 . . cranked
 - 35/08 . . of closed hollow section
 - 35/10 . . adjustable for varying track {(tools for axial movement of wheels on axles [B60B 29/008](#))}
 - 35/1009 . . . {operated manually}
 - 35/1018 {comprising a locking pin}
 - 35/1027 {comprising a clamping mechanism}
 - 35/1036 . . . {operated with power assistance}
 - 35/1045 {electrically}
 - 35/1054 {hydraulically}
 - 35/1063 {automatically dependent on operational state of the vehicle}
 - 35/1072 . . . {by transversally movable elements}
 - 35/1081 {the element is a wheel}
 - 35/109 {the element is an axle part}
 - 35/12 . Torque-transmitting axles ([independent suspension aspects \[B60G\]\(#\)](#))
 - 35/121 . . {Power-transmission from drive shaft to hub}
 - 35/122 . . . {using gears}
 - 35/124 {of the helical or worm type}
 - 35/125 {of the planetary type}
 - 35/127 . . . {using universal joints}
 - 35/128 {of the homokinetic or constant velocity type}
 - 35/14 . . composite or split, e.g. half- axles; Couplings between axle parts or sections
 - 35/16 . . Axle housings
 - 35/163 . . . {characterised by specific shape of the housing, e.g. adaptations to give space for other vehicle elements like chassis or exhaust system}
 - 35/166 . . . {characterised by reinforcements, e.g. reinforcement ribs}
 - 35/18 . . Arrangement of bearings
- 37/00 Wheel-axle combinations, e.g. wheel sets (units comprising multiple wheels arranged side-by-side [B60B 11/00](#); rail vehicle axle-boxes [B61F](#))**
- 37/02 . the wheels being integral with solid axles
 - 37/04 . the wheels being rigidly attached to solid axles
 - 37/06 . the wheels being integral with, or rigidly attached to, hollow axles
 - 37/08 . . the hollow axles being rotatable around fixed axles
 - 37/10 . the wheels being individually rotatable around the axles
 - 37/12 . Axles with a fixed ground wheel and a loose wheel

39/00	Increasing wheel adhesion (wheels, wheel attachments or tyre attachments, designed for increasing traction B60B 15/00, B60C; tyre constructions B60C; road surface conditioning to prevent slipperiness E01C)	2310/213	. . by punching
39/003	. {Vehicle mounted non-skid chains actuated by centrifugal force (non-skid devices temporarily attachable to resilient tyres B60C 27/00)}	2310/214	. . by extrusion
39/006	. . {characterised by a control system for the actuation of the rotating chain wheel}	2310/218	. . by hydroforming
39/02	. Vehicle fittings for scattering or dispensing material in front of its wheels	2310/221	. . by magnetic pulse forming
39/021	. . {Details of the dispensing device}	2310/222	. . by twisting
39/022	. . . {related to reservoirs}	2310/224	. . by rolling
39/023	. . . {related to metering valves}	2310/226	. . by cutting
39/024	. . . {related to preconditioning of the dispensing materials}	2310/228	. . by machining
39/025	. . . {related to the control system}	2310/231	. . by turning
39/026	. . {the material being in gas form}	2310/232	. . by milling
39/027	. . . {the gas being heated on purpose}	2310/234	. . by grinding
39/028	. . . {the gas being exhaust gas}	2310/238	. . by thermal spraying of molten material
39/04	. . the material being granular, e.g. sand (combined control of sanding apparatus and brakes of rail vehicles B61H)	2310/241	. . by weaving or knitting of fibers
39/06	. . . the dispensing being effected by mechanical means	2310/242	. . by laminating, e.g. fabrication of sandwich sheets
39/08	. . . the dispensing being effected by fluid means	2310/30	. joining
39/083 {dispensing being effected by liquid}	2310/302	. . by welding
39/086 {dispensing being effected by gas}	2310/3021	. . . by autogen welding
39/10	. . . the dispensing being controlled electrically or electromagnetically	2310/3022	. . . by spot welding, plug welding
39/12	. . the material being sheet-like or web-like	2310/3023	. . . by arc welding, e.g. inert gas arc welding
		2310/3025	. . . by thermal welding, e.g. friction, induction or ultrasonic welding
		2310/3026	. . . by laser welding
		2310/3027	. . . by electron beam welding
		2310/3028	. . . by magnetic pulse welding
		2310/303	. . by soldering
		2310/305	. . by screwing
		2310/306	. . by clamping or wedging, e.g. by clamping inserts as joining means
		2310/307	. . by removably mountable securing elements, e.g. circlips
		2310/311	. . by riveting
		2310/3112	. . . by punch-riveting
		2310/312	. . by hemming or seaming, e.g. by folding of the rim
		2310/314	. . by deformation
		2310/3142	. . by caulking
		2310/316	. . by press-fitting, shrink-fitting
		2310/318	. . by adhesive bonding, e.g. glueing
		2310/321	. . by overmolding
		2310/323	. . by coextrusion
		2310/329	. . by splicing, e.g. of ropes
		2310/50	. Thermal treatment
		2310/52	. . Curing
		2310/54	. . Hardening
		2310/542	. . . Quenching
		2310/56	. . Co-curing; Vulcanisation
		2310/60	. Surface treatment; After treatment
		2310/612	. . Polishing
		2310/614	. . Painting
		2310/616	. . Coating with thin films
		2310/6162	. . . Conductive films
		2310/618	. . Coating with foils
		2310/621	. . Electro-chemical processes
		2310/622	. . Shot-peening
		2310/64	. . Effect of treatments
		2310/642	. . . Matted
		2310/644	. . . Polished
		2310/646	. . . Engraved
		2310/648	. . . Structured
		2310/651	. . . glossy
		2310/652	. . . Reflecting
		2310/654	. . . Anti-corrosive
2200/00	Type of product being used or applied		
2200/20	. Furniture or medical appliances		
2200/22	. . Chairs		
2200/222	. . . Office chairs		
2200/224	. . . Arm chairs		
2200/24	. . Beds		
2200/242	. . . Hospital beds		
2200/26	. . Medical appliances		
2200/40	. Articles of daily use		
2200/41	. . Waste bins		
2200/43	. . Carts		
2200/432	. . . Shopping carts		
2200/434	. . . Wheel barrows		
2200/45	. . Suitcases		
2200/47	. . Physical activity equipment, e.g. leisure or sports articles		
2200/49	. . Domestic appliances, e.g. vacuum cleaners		
2310/00	Manufacturing methods		
2310/20	. Shaping		
2310/202	. . by casting		
2310/204	. . by moulding, e.g. injection moulding, i.e. casting of plastics material		
2310/206	. . by stamping		
2310/208	. . by forging		
2310/2082	. . . by swaging		
2310/211	. . by folding or bending		
2310/212	. . by drawing		

- 2310/656 . . . Decorative
- 2310/658 . . . For advertising
- 2310/661 . . . for protection, e.g. against scratches or stone chips
- 2310/80 . Filament winding
- 2320/00 Manufacturing or maintenance operations**
- 2320/10 . Assembling; disassembling
- 2320/12 . . Assembly devices for spoked wheels
- 2320/122 . . . for spoke tensioning
- 2320/124 . . . for trueing of spoked wheels
- 2320/126 . . . for restoring form or removing local distortions of wheel rims in unassembled state
- 2320/14 . . Assembly devices for divided rims
- 2320/16 . . Devices for attaching or removing cover discs, hub caps or other ornamental rings or elements
- 2320/30 . Balancing
- 2320/50 . Securing
- 2320/52 . . to prevent loss
- 2320/522 . . . by locking washer
- 2320/524 . . . by securing plate
- 2340/00 Wheel transporting, Mounting of wheels**
- 2340/10 . Operation mode
- 2340/12 . . Operated manually
- 2340/14 . . Power driven
- 2340/16 . . Included in assembly line
- 2340/18 . . Automated process
- 2340/30 . Wheel transporting or handling devices
- 2340/32 . . for gripping the wheel
- 2340/34 . . for positioning the wheel to hub or boltholes
- 2340/36 . . the devices being provided on a dolly
- 2340/50 . Wheel mounting or removal devices
- 2340/52 . . Auxiliary tools, e.g. For alignment
- 2340/70 . Lifting jacks
- 2360/00 Materials; Physical forms thereof**
- 2360/10 . Metallic materials
- 2360/102 . . Steel
- 2360/104 . . Aluminum
- 2360/106 . . Magnesia
- 2360/108 . . Titanium
- 2360/109 . . Bronze
- 2360/14 . Physical forms of metallic parts
- 2360/141 . . Sheet-metals
- 2360/143 . . Bars, i.e. being solid
- 2360/1432 . . . of circular cross section
- 2360/1434 . . . of polygonal cross section, e.g. triangular or rectangular
- 2360/1436 . . . of elliptical cross section
- 2360/144 . . Tubes, i.e. being hollow
- 2360/1442 . . . of circular cross section
- 2360/1444 . . . of rectangular cross section
- 2360/1446 . . . of elliptical cross section
- 2360/1448 . . . of irregular cross-section
- 2360/145 . . Profiles, i.e. being solid and having irregular cross-section
- 2360/1452 . . . L-profiles
- 2360/1454 . . . T or H-Profiles
- 2360/1456 . . . X or Y-Profiles
- 2360/1458 . . . U or V-Profiles
- 2360/147 . . Castings
- 2360/148 . . Sinterings
- 2360/149 . . Metal foams
- 2360/30 . Synthetic materials
- 2360/32 . . Plastic compositions
- 2360/322 . . . Comprising polypropylene
- 2360/324 . . . Comprising polyurethane
- 2360/33 . . Synthetic foams
- 2360/34 . . Reinforced plastics
- 2360/341 . . . with fibres
- 2360/3412 Glass fibres
- 2360/3414 Aramide fibres
- 2360/3416 Carbone fibres
- 2360/3418 Aramid fibres
- 2360/342 . . . With strands
- 2360/3422 consisting of fibres oriented substantially parallel
- 2360/3424 consisting of braided fibres
- 2360/344 . . . With woven material
- 2360/3442 characterised by material mixes
- 2360/3444 characterised by weaving patterns
- 2360/346 . . . Material impregnated with resin before being put into form, i.e. prepregs
- 2360/3462 comprising strands
- 2360/3464 comprising woven material
- 2360/348 . . . Resins
- 2360/36 . . Composite materials
- 2360/362 . . . Compounded sheets
- 2360/364 . . . comprising honeycomb structures
- 2360/366 . . . comprising foams, e.g. synthetic or metal foams
- 2360/368 . . . Coproduced material combinations, e.g. By over-molding, co-extrusion, co-curing or vulcanizing
- 2360/50 . Rubbers
- 2360/70 . Ceramics
- 2360/90 . Wood
- 2360/92 . Leather
- 2360/94 . Cardboard or papers
- 2380/00 Bearings**
- 2380/10 . Type
- 2380/12 . . Ball bearings
- 2380/14 . . Roller bearings
- 2380/16 . . Needle bearings
- 2380/18 . . Plain or sleeve bearings
- 2380/20 . . Linear bearings
- 2380/22 . . Magnetic bearings
- 2380/30 . Cage
- 2380/32 . . Without cage
- 2380/40 . Modularity
- 2380/42 . . Single-piece
- 2380/44 . . Multi-piece
- 2380/50 . Load bearing capacity
- 2380/60 . Rolling elements
- 2380/62 . . Specific number
- 2380/64 . . Specific shape
- 2380/70 . Arrangements
- 2380/71 . . Single track
- 2380/73 . . Double track
- 2380/75 . . Twin or multiple bearings having identical diameters
- 2380/76 . . Twin or multiple bearings having different diameters

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- 2380/77 . . Diameters of bearings at opposite ends of hub
- 2380/772 . . . Identical diameters of bearings at opposite ends of hub
- 2380/774 . . . Different diameters of bearings at opposite ends of hub
- 2380/80 . Shafts specially adapted to receive bearings
- 2380/82 . . Caulked to fix race
- 2380/90 . Casings or housings specially adapted to receive bearings
- 2380/92 . . Caulked to fix race
- 2900/00 Purpose of invention**
- 2900/10 . Reduction of
- 2900/111 . . Weight
- 2900/112 . . Costs
- 2900/113 . . Production or maintenance time
- 2900/114 . . Size
- 2900/115 . . Complexity
- 2900/116 . . Product variety, e.g. by standardisation or use of adapters
- 2900/121 . . Resisting forces
- 2900/1212 . . . due to friction
- 2900/1214 . . . due to inertia
- 2900/1216 . . . due to air-drag
- 2900/131 . . Vibrations
- 2900/133 . . Noise
- 2900/141 . . Corrosions
- 2900/20 . Avoidance of
- 2900/211 . . Soiling
- 2900/212 . . Damage
- 2900/30 . Increase in
- 2900/311 . . Rigidity or stiffness
- 2900/313 . . Resiliency
- 2900/321 . . Lifetime
- 2900/323 . . Timespan between services
- 2900/325 . . Reliability
- 2900/331 . . Safety or security
- 2900/3312 . . . during regular use
- 2900/3313 . . . during maintenance
- 2900/3314 . . . during production or assembly
- 2900/3315 . . . by avoiding misuse
- 2900/3316 . . . by indicating wear, failure or loss
- 2900/3318 . . . by theft prevention
- 2900/351 . . versatility, e.g. usable for different purposes or different arrangements
- 2900/50 . Improvement of
- 2900/511 . . Sealing
- 2900/5112 . . . against dust or dirt
- 2900/5114 . . . against humidity or water
- 2900/5116 . . . against air-loss
- 2900/5118 . . . against oil-loss
- 2900/513 . . Cooling, e.g. of brakes
- 2900/521 . . Tyre mounting or removal ([devices therefor B60B 2340/50](#))
- 2900/523 . . Tyre fixation on rim, e.g. fixing axially or circumferentially thereon
- 2900/531 . . User-friendliness
- 2900/541 . . Servicing
- 2900/551 . . Handling of obstacles or difficult terrains
- 2900/561 . . Lubrication
- 2900/571 . . Visibility
- 2900/572 . . Visual appearance
- 2900/70 . Adaptation for
- 2900/711 . . High loads, e.g. by reinforcements
- 2900/721 . . Use under adverse external conditions
- 2900/731 . . Use in cases of damage, failure or emergency
- 2900/90 . Providing or changing
- 2900/911 . . Eccentricity
- 2900/921 . . Conductivity
- 2900/931 . . Magnetic effects