

# 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](#))

**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](#))

- 1/00 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}
- 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}
- 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 tire
- 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 tire}
- 15/266 . . {Traction increasing surface being located radially outside tire 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 . expandable
- 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 tire 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 gearings}
- 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)**

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| 39/003         | . { Vehicle mounted non-skid chains actuated by centrifugal force (non-skid devices temporarily attachable to resilient tyres <a href="#">B60C 27/00</a> ) } | 2310/222  | . . by twisting  |
| 39/006         | . . { characterised by a control system for the actuation of the rotating chain wheel }  | 2310/224  | . . by rolling   |
| 39/02          | . Vehicle fittings for scattering or dispensing material in front of its wheels  | 2310/226  | . . by cutting   |
| 39/021         | . . { Details of the dispensing device }   | 2310/228  | . . by machining   |
| 39/022         | . . . { related to reservoirs }  | 2310/231  | . . by turning   |
| 39/023         | . . . { related to metering valves }   | 2310/232  | . . by milling   |
| 39/024         | . . . { related to preconditioning of the dispensing materials }   | 2310/234  | . . by grinding  |
| 39/025         | . . . { related to the control system }  | 2310/238  | . . by thermal spraying of molten material                               |
| 39/026         | . . { the material being in gas form }   | 2310/241  | . . by weaving or knitting of fibers                                     |
| 39/027         | . . . { the gas being heated on purpose }  | 2310/242  | . . by laminating, e.g. fabrication of sandwich sheets                   |
| 39/028         | . . . { the gas being exhaust gas }  | 2310/30   | . joining  |
| 39/04          | . . the material being granular, e.g. sand (combined control of sanding apparatus and brakes of rail vehicles <a href="#">B61H</a> )                         | 2310/302  | . . by welding   |
| 39/06          | . . . the dispensing being effected by mechanical means  | 2310/3021 | . . . by autogen welding   |
| 39/08          | . . . the dispensing being effected by fluid means   | 2310/3022 | . . . by spot welding, plug welding                                      |
| 39/083         | . . . . { dispensing being effected by liquid }  | 2310/3023 | . . . by arc welding, e.g. inert gas arc welding                         |
| 39/086         | . . . . { dispensing being effected by gas }   | 2310/3025 | . . . by thermal welding, e.g. friction, induction or ultrasonic welding |
| 39/10          | . . . the dispensing being controlled electrically or electromagnetically  | 2310/3026 | . . . by laser welding   |
| 39/12          | . . the material being sheet-like or web-like  | 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   |
|                |  | 2310/656  | . . . Decorative   |
|                |  | 2310/658  | . . . For advertising  |
|                |  | 2310/661  | . . . for protection, e.g. against scratches or stone chips              |
| <b>2200/00</b> | <b>Type of product being used or applied (kind of vehicle product being used or applied <a href="#">B60Y 2200/00</a>)</b>                                    |           |  |
| 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  |           |  |
| <b>2310/00</b> | <b>Manufacturing methods</b>   |           |  |
| 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   |           |  |
| 2310/213       | . . by punching  |           |  |
| 2310/214       | . . by extrusion   |           |  |
| 2310/218       | . . by hydroforming  |           |  |
| 2310/221       | . . by magnetic pulse forming  |           |  |

|                |   |                |  |
|----------------|---|----------------|--|
| 2310/80        | . Filament winding  | 2360/324       | . . . Comprising polyurethane  |
| <b>2320/00</b> | <b>Manufacturing or maintenance operations</b>  | 2360/33        | . . Synthetic foams  |
| 2320/10        | . Assembling; disassembling   | 2360/34        | . . Reinforced plastics  |
| 2320/12        | . . Assembly devices for spoked wheels  | 2360/341       | . . . with fibres  |
| 2320/122       | . . . for spoke tensioning  | 2360/3412      | . . . . Glass fibres   |
| 2320/124       | . . . for trueing of spoked wheels  | 2360/3414      | . . . . Aramide fibres   |
| 2320/126       | . . . for restoring form or removing local distortions of wheel rims in unassembled state         | 2360/3416      | . . . . Carbone fibres   |
| 2320/14        | . . Assembly devices for divided rims   | 2360/3418      | . . . . Aramid fibres  |
| 2320/16        | . . Devices for attaching or removing cover discs, hub caps or other ornamental rings or elements | 2360/342       | . . . With strands   |
| 2320/30        | . Balancing   | 2360/3422      | . . . . consisting of fibres oriented substantially parallel   |
| 2320/50        | . Securing  | 2360/3424      | . . . . consisting of braided fibres   |
| 2320/52        | . . to prevent loss   | 2360/344       | . . . With woven material  |
| 2320/522       | . . . by locking washer   | 2360/3442      | . . . . characterised by material mixes  |
| 2320/524       | . . . by securing plate   | 2360/3444      | . . . . characterised by weaving patterns  |
| <b>2340/00</b> | <b>Wheel transporting, Mounting of wheels</b>   | 2360/346       | . . . Material impregnated with resin before being put into form, i.e. prepregs                      |
| 2340/10        | . Operation mode  | 2360/3462      | . . . . comprising strands   |
| 2340/12        | . . Operated manually   | 2360/3464      | . . . . comprising woven material  |
| 2340/14        | . . Power driven  | 2360/348       | . . . Resins   |
| 2340/16        | . . Included in assembly line   | 2360/36        | . . Composite materials  |
| 2340/18        | . . Automated process   | 2360/362       | . . . Compounded sheets  |
| 2340/30        | . Wheel transporting or handling devices  | 2360/364       | . . . comprising honeycomb structures  |
| 2340/32        | . . for gripping the wheel  | 2360/366       | . . . comprising foams, e.g. synthetic or metal foams  |
| 2340/34        | . . for positioning the wheel to hub or boltholes   | 2360/368       | . . . Coproduced material combinations, e.g. By over-molding, co-extrusion, co-curing or vulcanizing |
| 2340/36        | . . the devices being provided on a dolly   | 2360/50        | . Rubbers  |
| 2340/50        | . Wheel mounting or removal devices   | 2360/70        | . Ceramics   |
| 2340/52        | . . Auxiliary tools, e.g. For alignment   | 2360/90        | . Wood   |
| 2340/70        | . Lifting jacks   | 2360/92        | . Leather  |
| <b>2360/00</b> | <b>Materials; Physical forms thereof</b>  | 2360/94        | . Cardboard or papers  |
| 2360/10        | . Metallic materials  | <b>2380/00</b> | <b>Bearings</b>  |
| 2360/102       | . . Steel   | 2380/10        | . Type   |
| 2360/104       | . . Aluminum  | 2380/12        | . . Ball bearings  |
| 2360/106       | . . Magnesia  | 2380/14        | . . Roller bearings  |
| 2360/108       | . . Titanium  | 2380/16        | . . Needle bearings  |
| 2360/109       | . . Bronze  | 2380/18        | . . Plain or sleeve bearings   |
| 2360/14        | . Physical forms of metallic parts  | 2380/20        | . . Linear bearings  |
| 2360/141       | . . Sheet-metals  | 2380/22        | . . Magnetic bearings  |
| 2360/143       | . . Bars, i.e. being solid  | 2380/30        | . Cage   |
| 2360/1432      | . . . of circular cross section   | 2380/32        | . . Without cage   |
| 2360/1434      | . . . of polygonal cross section, e.g. triangular or rectangular                                  | 2380/40        | . Modularity   |
| 2360/1436      | . . . of elliptical cross section   | 2380/42        | . . Single-piece   |
| 2360/144       | . . Tubes, i.e. being hollow  | 2380/44        | . . Multi-piece  |
| 2360/1442      | . . . of circular cross section   | 2380/50        | . Load bearing capacity  |
| 2360/1444      | . . . of rectangular cross section  | 2380/60        | . Rolling elements   |
| 2360/1446      | . . . of elliptical cross section   | 2380/62        | . . Specific number  |
| 2360/1448      | . . . of irregular cross-section  | 2380/64        | . . Specific shape   |
| 2360/145       | . . Profiles, i.e. being solid and having irregular cross-section                                 | 2380/70        | . Arrangements   |
| 2360/1452      | . . . L-profiles  | 2380/71        | . . Single track   |
| 2360/1454      | . . . T or H-Profiles   | 2380/73        | . . Double track   |
| 2360/1456      | . . . X or Y-Profiles   | 2380/75        | . . Twin or multiple bearings having identical diameters   |
| 2360/1458      | . . . U or V-Profiles   | 2380/76        | . . Twin or multiple bearings having different diameters   |
| 2360/147       | . . Castings  | 2380/77        | . . Diameters of bearings at opposite ends of hub  |
| 2360/148       | . . Sinterings  | 2380/772       | . . . Identical diameters of bearings at opposite ends of hub  |
| 2360/149       | . . Metal foams   |                |  |
| 2360/30        | . Synthetic materials   |                |  |
| 2360/32        | . . Plastic compositions  |                |  |
| 2360/322       | . . . Comprising polypropylene  |                |  |

|                |  |          |  |
|----------------|--|----------|--|
| 2380/774       | . . . Different diameters of bearings at opposite ends of hub                  | 2900/731 | . . Use in cases of damage, failure or emergency |
| 2380/80        | . Shafts specially adapted to receive bearings                                 | 2900/90  | . Providing or changing                          |
| 2380/82        | . . Caulked to fix race  | 2900/911 | . . Eccentricity                                 |
| 2380/90        | . Casings or housings specially adapted to receive bearings                    | 2900/921 | . . Conductivity                                 |
| 2380/92        | . . Caulked to fix race  | 2900/931 | . . Magnetic effects                             |
| <b>2900/00</b> | <b>Purpose of invention</b>  |          |  |
| 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       | . . Tire mounting or removal ( <a href="#">devices therefor B60B 2340/50</a> ) |          |  |
| 2900/523       | . . Tire 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                                      |          |  |