

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](#))

- 1/00 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)	35/001	. {Axles of the portal type, i.e. axles designed for higher ground clearance}
33/0002	. {assembling to the object, e.g. furniture}	35/002	. {Axles of the low floor type, e.g. for low-floor city busses}
33/0005	. . {characterised by mounting method}	35/003	. {Steerable axles}
33/0007	. . . {by screwing}	35/004	. {Mounting arrangements for axles}
33/001	. . . {by snapping, clicking or latching in}	35/005	. . {with adaptations at chassis structure}
33/0013	. . . {by straps, bands or similar}	35/006	. . {with mounting plates or consoles fitted to axles}
33/0015	. . {characterised by adaptations made to castor}	35/007	. . . {for mounting suspension elements to axles}
33/0018	. . . {in the form of a flat mounting plate}	35/008	. . . {for mounting air suspension elements to axles}
33/0021	. . . {in the form of a mounting pin}	35/009	. {adapted for tiltable wheels}
33/0023	. . . {in the form of specific adaptations to the form of the object}	35/02	. Dead axles, i.e. not transmitting torque
33/0026	. . {characterised by adaptations made to the object}	35/025	. . {the wheels being removable}
33/0028	. {Construction of wheels; methods of assembling on axle}	35/04	. . straight
33/0036	. {characterised by type of wheels}	35/06	. . cranked
33/0039	. . {Single wheels}	35/08	. . of closed hollow section
33/0042	. . {Double or twin wheels}	35/10	. . adjustable for varying track {(tools for axial movement of wheels on axles B60B 29/008)}
33/0044	. . {Roller type wheels, i.e. extra wide wheels}	35/1009	. . . {operated manually}
33/0047	. {characterised by details of the rolling axle}	35/1018	. . . . {comprising a locking pin}
33/0049	. . {the rolling axle being horizontal}	35/1027	. . . . {comprising a clamping mechanism}
33/0052	. . {the rolling axle being inclined}	35/1036	. . . {operated with power assistance}
33/0055	. . {the rolling axle intersects swivel axis}	35/1045	. . . . {electrically}
33/0057	. . {the rolling axle being offset from swivel axis}	35/1054	. . . . {hydraulically}
33/006	. {characterised by details of the swivel mechanism}	35/1063	. . . . {automatically dependent on operational state of the vehicle}
33/0063	. . {no swivelling action, i.e. no real caster}	35/1072	. . . {by transversally movable elements}
33/0065	. . {characterised by details of the swivel axis}	35/1081	. . . . {the element is a wheel}
33/0068	. . . {the swivel axis being vertical}	35/109	. . . . {the element is an axle part}
33/0071	. . . {the swivel axis being inclined}	35/12	. Torque-transmitting axles (independent suspension aspects B60G)
33/0073	. . . {the swivel axis being symmetrical to wheel or wheels}	35/121	. . {Power-transmission from drive shaft to hub}
33/0076	. . . {the swivel axis being offset laterally from wheel center plane}	35/122	. . . {using gearings}
33/0078	. {characterised by details of the wheel braking mechanism}	35/124	. . . . {of the helical or worm type}
33/0081	. . {acting on tire tread}	35/125	. . . . {of the planetary type}
33/0084	. . {acting on axle end}	35/127	. . . {using universal joints}
33/0086	. . {acting on rim or side portion of tyre}	35/128	. . . . {of the homokinetic or constant velocity type}
33/0089	. . {acting on the floor}	35/14	. . composite or split, e.g. half- axles; Couplings between axle parts or sections
33/0092	. . {actuated remotely, e.g. by cable or electrically}	35/16	. . Axle housings
33/0094	. . {actuated automatically}	35/163	. . . {characterised by specific shape of the housing, e.g. adaptations to give space for other vehicle elements like chassis or exhaust system}
33/0097	. . {acting permanently, e.g. for increased security on low friction surfaces}	35/166	. . . {characterised by reinforcements, e.g. reinforcement ribs}
33/02	. with disengageable swivel action {, i.e. comprising a swivel locking mechanism}	35/18	. . Arrangement of bearings
33/021	. . {combined with braking of castor wheel}	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)
33/023	. . {by using friction}	37/02	. the wheels being integral with solid axles
33/025	. . {by using form-fit, e.g. front teeth}	37/04	. the wheels being rigidly attached to solid axles
33/026	. . {being actuated remotely, e.g. by cable or electrically}	37/06	. the wheels being integral with, or rigidly attached to, hollow axles
33/028	. . {being actuated automatically}	37/08	. . the hollow axles being rotatable around fixed axles
33/04	. adjustable {, e.g. in height; linearly shifting castors}	37/10	. the wheels being individually rotatable around the axles
33/045	. . {mounted resiliently, by means of dampers}	37/12	. Axles with a fixed ground wheel and a loose wheel
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}		

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
		2310/214	. . by extrusion
		2310/218	. . by hydroforming
		2310/221	. . by magnetic pulse forming
		2310/222	. . by twisting
39/003	. {Vehicle mounted non-skid chains actuated by centrifugal force (non-skid devices temporarily attachable to resilient tyres B60C 27/00)}	2310/224	. . by rolling
39/006	. . {characterised by a control system for the actuation of the rotating chain wheel}	2310/226	. . by cutting
		2310/228	. . by machining
39/02	. Vehicle fittings for scattering or dispensing material in front of its wheels	2310/231	. . by turning
		2310/232	. . by milling
39/021	. . {Details of the dispensing device}	2310/234	. . by grinding
39/022	. . . {related to reservoirs}	2310/238	. . by thermal spraying of molten material
39/023	. . . {related to metering valves}	2310/241	. . by weaving or knitting of fibers
39/024	. . . {related to preconditioning of the dispensing materials}	2310/242	. . by laminating, e.g. fabrication of sandwich sheets
		2310/30	. joining
39/025	. . . {related to the control system}	2310/302	. . by welding
39/026	. . {the material being in gas form}	2310/3021	. . . by autogen welding
39/027	. . . {the gas being heated on purpose}	2310/3022	. . . by spot welding, plug welding
39/028	. . . {the gas being exhaust gas}	2310/3023	. . . by arc welding, e.g. inert gas arc welding
39/04	. . the material being granular, e.g. sand (combined control of sanding apparatus and brakes of rail vehicles B61H)	2310/3025	. . . by thermal welding, e.g. friction, induction or ultrasonic welding
		2310/3026	. . . by laser welding
39/06	. . . the dispensing being effected by mechanical means	2310/3027	. . . by electron beam welding
		2310/3028	. . . by magnetic pulse welding
39/08	. . . the dispensing being effected by fluid means	2310/303	. . by soldering
39/083	. . . . {dispensing being effected by liquid}	2310/305	. . by screwing
39/086	. . . . {dispensing being effected by gas}	2310/306	. . by clamping or wedging, e.g. by clamping inserts as joining means
39/10	. . . the dispensing being controlled electrically or electromagnetically	2310/307	. . by removably mountable securing elements, e.g. circlips
39/12	. . the material being sheet-like or web-like	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	2360/149	. . Metal foams
2310/658	. . . For advertising	2360/30	. Synthetic materials
2310/661	. . . for protection, e.g. against scratches or stone chips	2360/32	. . Plastic compositions
2310/80	. Filament winding	2360/322	. . . Comprising polypropylene
2320/00	Manufacturing or maintenance operations	2360/324	. . . Comprising polyurethane
2320/10	. Assembling; disassembling	2360/33	. . Synthetic foams
2320/12	. . Assembly devices for spoked wheels	2360/34	. . Reinforced plastics
2320/122	. . . for spoke tensioning	2360/341	. . . with fibres
2320/124	. . . for trueing of spoked wheels	2360/3412	. . . . Glass fibres
2320/126	. . . for restoring form or removing local distortions of wheel rims in unassembled state	2360/3414	. . . . Aramide fibres
2320/14	. . Assembly devices for divided rims	2360/3416	. . . . Carbone fibres
2320/16	. . Devices for attaching or removing cover discs, hub caps or other ornamental rings or elements	2360/3418	. . . . Aramid fibres
2320/30	. Balancing	2360/342	. . . With strands
2320/50	. Securing	2360/3422	. . . . consisting of fibres oriented substantially parallel
2320/52	. . to prevent loss	2360/3424	. . . . consisting of braided fibres
2320/522	. . . by locking washer	2360/344	. . . With woven material
2320/524	. . . by securing plate	2360/3442	. . . . characterised by material mixes
2340/00	Wheel transporting, Mounting of wheels	2360/3444	. . . . characterised by weaving patterns
2340/10	. Operation mode	2360/346	. . . Material impregnated with resin before being put into form, i.e. prepregs
2340/12	. . Operated manually	2360/3462	. . . . comprising strands
2340/14	. . Power driven	2360/3464	. . . . comprising woven material
2340/16	. . Included in assembly line	2360/348	. . . Resins
2340/18	. . Automated process	2360/36	. . Composite materials
2340/30	. Wheel transporting or handling devices	2360/362	. . . Compounded sheets
2340/32	. . for gripping the wheel	2360/364	. . . comprising honeycomb structures
2340/34	. . for positioning the wheel to hub or boltholes	2360/366	. . . comprising foams, e.g. synthetic or metal foams
2340/36	. . the devices being provided on a dolly	2360/368	. . . Coproduced material combinations, e.g. By over-molding, co-extrusion, co-curing or vulcanizing
2340/50	. Wheel mounting or removal devices	2360/50	. Rubbers
2340/52	. . Auxiliary tools, e.g. For alignment	2360/70	. Ceramics
2340/70	. Lifting jacks	2360/90	. Wood
2360/00	Materials; Physical forms thereof	2360/92	. Leather
2360/10	. Metallic materials	2360/94	. Cardboard or papers
2360/102	. . Steel	2380/00	Bearings
2360/104	. . Aluminum	2380/10	. Type
2360/106	. . Magnesia	2380/12	. . Ball bearings
2360/108	. . Titanium	2380/14	. . Roller bearings
2360/109	. . Bronze	2380/16	. . Needle bearings
2360/14	. Physical forms of metallic parts	2380/18	. . Plain or sleeve bearings
2360/141	. . Sheet-metals	2380/20	. . Linear bearings
2360/143	. . Bars, i.e. being solid	2380/22	. . Magnetic bearings
2360/1432	. . . of circular cross section	2380/30	. Cage
2360/1434	. . . of polygonal cross section, e.g. triangular or rectangular	2380/32	. . Without cage
2360/1436	. . . of elliptical cross section	2380/40	. Modularity
2360/144	. . Tubes, i.e. being hollow	2380/42	. . Single-piece
2360/1442	. . . of circular cross section	2380/44	. . Multi-piece
2360/1444	. . . of rectangular cross section	2380/50	. Load bearing capacity
2360/1446	. . . of elliptical cross section	2380/60	. Rolling elements
2360/1448	. . . of irregular cross-section	2380/62	. . Specific number
2360/145	. . Profiles, i.e. being solid and having irregular cross-section	2380/64	. . Specific shape
2360/1452	. . . L-profiles	2380/70	. Arrangements
2360/1454	. . . T or H-Profiles	2380/71	. . Single track
2360/1456	. . . X or Y-Profiles	2380/73	. . Double track
2360/1458	. . . U or V-Profiles	2380/75	. . Twin or multiple bearings having identical diameters
2360/147	. . Castings	2380/76	. . Twin or multiple bearings having different diameters
2360/148	. . Sinterings		

2380/77	. .	Diameters of bearings at opposite ends of hub	2900/711	. .	High loads, e.g. by reinforcements
2380/772	. . .	Identical diameters of bearings at opposite ends of hub	2900/721	. .	Use under adverse external conditions
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
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	. .	Tire mounting or removal			
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			