

**CPC****COOPERATIVE PATENT CLASSIFICATION****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](#))

**B60B 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](#)})

- B60B 1/003 . {specially adapted for bicycles ([B60B 1/041](#) takes precedence)}
- B60B 1/006 . {specially adapted for light-weight wheels, e.g. of strollers or wheel-chairs ([B60B 1/003](#) takes precedence)}
- B60B 1/02 . Wheels with wire or other tension spokes
- B60B 1/0207 .. {characterised by non-standard number of spokes, i.e. less than 12 or more than 32 spokes}
- B60B 1/0215 .. {characterised by specific grouping of spokes}
- B60B 1/0223 ... {the dominant aspect being the spoke arrangement pattern}
- B60B 1/023 .... {multiple exclusively parallel spokes arranged in a group}
- B60B 1/0238 ... {the dominant aspect being the number of spokes per group}
- B60B 1/0246 .. {characterised by cross-section of the spoke, e.g. polygon or elliptic shape}
- B60B 1/0253 .. {the spoke being hollow}
- B60B 1/0261 .. {characterised by spoke form}
- B60B 1/0269 ... {the spoke being curved or deformed over substantial part of length}
- B60B 1/0276 ... {the spoke being crooked in the middle and having double length}
- B60B 1/0284 ... {the spoke being threaded at both ends}
- B60B 1/0292 ... {the spoke being bent at both ends}
- B60B 1/04 .. Attaching spokes to rim or hub
- B60B 1/041 ... {of bicycle wheels (bicycle rims characterised by means for attaching spokes [B60B 21/062](#))}
- B60B 1/042 ... {Attaching spokes to hub}
- B60B 1/043 ... {Attaching spokes to rim}
- B60B 1/044 .... {by the use of spoke nipples}
- B60B 1/045 ..... {characterised by their specific shape}
- B60B 1/046 ..... {characterised by adaptations of the nipple for tightening tools}
- B60B 1/047 ..... {the nipple comprising sealing means}

- B60B 1/048 . . . . {by the use of screws}
- B60B 1/06 . Wheels with compression spokes ([wheels of high resiliency B60B 9/00](#))
- B60B 1/08 . . formed by casting
- B60B 1/10 . . fabricated by sheet metal ([B60B 1/12](#), [B60B 3/08](#) take precedence)
- B60B 1/12 . . with tubular spokes ([B60B 1/08](#) takes precedence)
- B60B 1/14 . . Attaching spokes to rim or hub
  
- B60B 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](#)})
- B60B 3/001 . {Lightweight wheels, e.g. for strollers or toys}
- B60B 3/002 . {characterised by the shape of the disc}
- B60B 3/004 . . {in the hub section}
- B60B 3/005 . . {in the section adjacent to rim}
- B60B 3/007 . . {in the intermediate section}
- B60B 3/008 . {by the form of wheel bolt mounting section}
- B60B 3/02 . with a single disc body integral with rim
- B60B 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}
- B60B 3/041 . . {characterised by the attachment of rim to wheel disc}
- B60B 3/042 . . . {characterised by circumferential position of attachment means}
- B60B 3/044 . . . {characterised by cross-sectional details of the attachment, e.g. the profile}
- B60B 3/045 . . . characterised by the attachment portions
- B60B 3/047 . . . . comprising specific torque transmitting means
- B60B 3/048 . . the rim being rotatably mounted to the wheel disc
- B60B 3/06 . formed by casting
- B60B 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](#))}
- B60B 3/082 . . {especially for light-weight wheels}
- B60B 3/085 . . {Discs having no mutual contact}
- B60B 3/087 . . {Discs having several mutual contact regions}
- B60B 3/10 . apertured to simulate spoked wheels
- B60B 3/12 . Means of reinforcing disc bodies
- B60B 3/14 . Attaching disc body to hub ([resiliently B60B 9/00](#); attaching rim to wheel body [B60B 23/00](#)) {Wheel adapters}
- B60B 3/142 . . {by central locking nut}
- B60B 3/145 . . {using washers or distance bushes}
- B60B 3/147 . . {using wheel adapters}
- B60B 3/16 . . by bolts or the like
- B60B 3/165 . . . {with locking devices for the fixing means, e.g. screw or nut covers}
- B60B 3/18 . . by circlips or the like

<b>B60B 5/00</b>	<b>Wheels, spokes, disc bodies, rims, hubs, wholly or predominantly made of non-metallic material</b> (wheel cover discs <a href="#">B60B 7/00</a> ; wheels of high resiliency <a href="#">B60B 9/00</a> {;wheel bodies comprising rail-engaging elements characterised by use of non-metallic material <a href="#">B60B 17/0003</a> })
B60B 5/02	. made of synthetic material
B60B 5/04	. made of wood
<b>B60B 7/00</b>	<b>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</b> (wheels with cooling fins not provided on the wheel cover disc <a href="#">B60B 19/10</a> ; apparatus or tools for removing or attaching cover discs hub caps or the like <a href="#">B60B 31/06</a> })
B60B 7/0006	. {for cycle wheels or similar}
B60B 7/0013	. {Hub caps}
B60B 7/002	.. {being of the ventilated type}
B60B 7/0026	. {characterised by the surface}
B60B 7/0033	.. {the dominant aspect being the surface appearance}
B60B 7/004	... {the surface being painted}
B60B 7/0046	... {the surface being plated or coated}
B60B 7/0053	... {the surface being decorated}
B60B 7/006	... {the surface being reflective or including lighting}
B60B 7/0066	.. {the dominant aspect being the surface structure}
B60B 7/0073	... {being completely closed, i.e. having no cooling openings for the brakes}
B60B 7/008	... {having decorative holes or openings, i.e. openings going beyond mere cooling openings}
B60B 7/0086	... {having cooling fins}
B60B 7/0093	. {being reinforced against thermal deformation}
B60B 7/01	. Rings specially adapted for covering only the wheel rim or the tyre sidewall, e.g. removable tyre sidewall trim rings
B60B 7/02	. made essentially in one part ({ <a href="#">B60B 7/0006</a> ,} <a href="#">B60B 7/01</a> take precedence)
B60B 7/04	. built-up of several main parts ( <a href="#">B60B 7/01</a> , <a href="#">B60B 7/20</a> take precedence)
B60B 7/06	. Fastening arrangements therefor ( <a href="#">B60B 7/01</a> , <a href="#">B60B 7/20</a> take precedence)
B60B 7/061	.. {characterised by the part of the wheels to which the discs, rings or the like are mounted}
B60B 7/063	... {to the rim}
B60B 7/065	... {to the disc}
B60B 7/066	... {to the hub}
B60B 7/068	... {to the wheel bolts or wheel nuts}
B60B 7/08	.. having gripping elements consisting of formations integral with the cover
B60B 7/10	.. comprising a plurality of spaced spring clips individually mounted on the cover, e.g. riveted, welded or readily releasable
B60B 7/105	... {the spring clip mounted on the rim}

- B60B 7/12
  - .. comprising an annular spring or gripping element mounted on the cover ([B60B 7/08](#) takes precedence)
- B60B 7/14
  - .. comprising screw-threaded means
- B60B 7/16
  - . Anti-theft devices
- B60B 7/18
  - . simulating spoked or wire wheel
- B60B 7/20
  - . having an element mounted for rotation independently of wheel rotation
  
- B60B 9/00**
**Wheels of high resiliency {, e.g. with conical interacting pressure-surfaces (resilient wheels comprising rail-engaging elements [B60B 17/0027](#))}**
- B60B 9/005
  - . {Comprising a resilient hub (hubs per se [B60B 27/00](#))}
- B60B 9/02
  - . using springs {resiliently mounted bicycle rims} (wheels comprising resilient spokes [B60B 9/26](#))
- B60B 9/04
  - .. in leaf form
- B60B 9/06
  - .. in helical form
- B60B 9/08
  - .. in flat coiled form
- B60B 9/10
  - .. of rubber or the like
- B60B 9/12
  - ... in the form of sleeves or rings concentric with the wheel axis
- B60B 9/14
  - ... with means limiting relative lateral movements between hub and remainder of wheel
- B60B 9/16
  - ... modified to ensure electric conductivity
- B60B 9/18
  - . using fluid ([within spokes B60B 9/26](#))
- B60B 9/20
  - .. in rings concentric with wheel axis
- B60B 9/22
  - ... inflatable
- B60B 9/24
  - .. with pistons and cylinders
- B60B 9/26
  - . comprising resilient spokes
- B60B 9/28
  - .. with telescopic action
  
- B60B 11/00**
**Units comprising multiple wheels arranged side by side; Wheels having more than one rim or capable of carrying more than one tyre**
- B60B 11/02
  - . Units of separate wheels mounted for independent or coupled rotation
- B60B 11/04
  - . Wheels with a rim capable of carrying more than one tyre
- B60B 11/06
  - . Wheels with more than one rim mounted on a single wheel body
- B60B 11/08
  - . Arrangements of balancing mechanisms enabling a uniform distribution of load to tyres
- B60B 11/10
  - . Emergency wheels ([collapsible tyres B60C 3/08](#); [tyres characterised by means enabling restricted operation in damaged or deflated condition B60C 17/00](#))
  
- B60B 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](#))**
- B60B 15/02
  - . Wheels with spade lugs
- B60B 15/021
  - .. {made of resilient material}
- B60B 15/023
  - .. {being of the broad form type}
- B60B 15/025
  - ... {with non-cylindrical shape}

- B60B 15/026 . . {characterised by mud deposit prevention}
- B60B 15/028 . . {characterised by active rotation of the lugs}
- B60B 15/04 . . with resiliently-mounted spade lugs
- B60B 15/06 . . with pivotally-mounted spade lugs
- B60B 15/08 . . with spade lugs axially displaced relatively to the tread surface of the tire
- B60B 15/10 . . with radially-adjustable spade lugs; Control mechanisms therefor
- B60B 15/12 . . . involving cams or eccentric hoops
- B60B 15/14 . . . involving an axially-displaceable cone
- B60B 15/16 . . . involving gearing, e.g. gear pinions acting upon threaded shafts on the spade lugs
- B60B 15/18 . Wheels with ground-engaging plate-like shoes
- B60B 15/20 . . with resiliently-mounted shoes, e.g. on a spider
- B60B 15/22 . . connected by links to the hub
- B60B 15/24 . Tread bands or rings for fairing lugs when travelling on the road
- B60B 15/26 . Auxiliary wheels or rings with traction-increasing surface attachable to the main wheel body
- B60B 15/263 . . {Traction increasing surface being located axially beside tire}
- B60B 15/266 . . {Traction increasing surface being located radially outside tire circumferential surface}
- B60B 15/28 . Wheel-ballasting weights; Their attachment
- B60B 17/00** **Wheels characterised by rail-engaging elements** ({wheel-axle combinations [B60B 37/00;](#) of model railways [A63H 19/22](#))
- B60B 17/0003 . {Wheel bodies characterised by use of non-metallic material ([B60B 17/0034](#) takes precedence)}
- B60B 17/0006 . {Construction of wheel bodies, e.g. disc wheels ([B60B 17/0003](#) takes precedence)}
- B60B 17/001 . . {Spoked wheels; Spokes thereof}
- B60B 17/0013 . . {formed by two or more axially spaced discs}
- B60B 17/0017 . . . {with insonorisation means}
- B60B 17/002 . . {with counter-balance}
- B60B 17/0024 . . {with noise reducing means ([B60B 17/0017](#) takes precedence)}
- B60B 17/0027 . {Resilient wheels, e.g. resilient hubs ([B60B 17/02](#) takes precedence)}
- B60B 17/0031 . . {using springs}
- B60B 17/0034 . . . {of rubber or other non-metallic material}
- B60B 17/0037 . . . . {of circular or elliptical cross section}
- B60B 17/0041 . . . . {of substantially rectangular cross section}
- B60B 17/0044 . . . . {single element arranged in V-form}
- B60B 17/0048 . . . . {pair of elements arranged in V-form}
- B60B 17/0051 . . {using fluid}
- B60B 17/0055 . {with non-elastic tyres (e.g. of particular profile or composition)}
- B60B 17/0058 . . {characterised by their fixing to wheel bodies}
- B60B 17/0062 . . {having teeth or protrusions on the circumference of the wheel}

- B60B 17/0065 . {Flange details}
- B60B 17/0068 . . {the flange being provided on a single side}
- B60B 17/0072 . . {the flange being provided on both sides}
- B60B 17/0075 . . {the flange being movable, for adaptation to variable rail or track widths}
- B60B 17/0079 . {the flange having a guide wheel}
- B60B 17/0082 . {Wheels designed to interact with a particular rail profile}
- B60B 17/0086 . . {H-type rail profiles, i.e. the wheels are arranged between upper and lower rail extensions}
- B60B 17/0089 . . {Circular rail profiles}
- B60B 17/0093 . . {Rectangular rail profiles}
- B60B 17/0096 . . {Triangular rail profiles}
- B60B 17/02 . with elastic tyres

**B60B 19/00** **Wheels not otherwise provided for or having characteristics specified in one of the sub-groups of this group**

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

**Rims; Hubs**

**B60B 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](#))

- B60B 21/02 . characterised by transverse section
- B60B 21/021 . . {with inwardly directed flanges, i.e. the tyre-seat being reversed}
- B60B 21/023 . . {the transverse section being non-symmetrical}
- B60B 21/025 . . {the transverse section being hollow}
- B60B 21/026 . . {the shape of rim well}
- B60B 21/028 . . {the shape of hump}
- B60B 21/04 . . with substantially radial flanges (with rail-engaging flanges [B60B 17/00](#)) {  
([B60B 21/021](#) takes precedence)}
- B60B 21/06 . characterised by means for attaching spokes {, i.e. spoke seats}
- B60B 21/062 . . {for bicycles}

- B60B 21/064 .. {characterised by shape of spoke mounting holes, e.g. elliptical or triangular}
- B60B 21/066 .. {the spoke mounting means being located on a flange oriented radially and formed on the radially inner side of the rim well}
- B60B 21/068 .. {the spoke seat comprising sealing means, e.g. for tubeless racing bike tyres}
- B60B 21/08 . characterised by having braking surfaces
- B60B 21/10 . characterised by the form of tyre-seat or flange, e.g. corrugated ([B60B 21/02](#) takes precedence)
- B60B 21/102 .. {the shape of bead seats}
- B60B 21/104 .. {the shape of flanges}
- B60B 21/106 ... {the shape of flange end-sections}
- B60B 21/108 .. {the surface of bead seats}
- B60B 21/12 . Appurtenances, e.g. lining bands
- B60B 21/125 .. Bead clamping elements

**B60B 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](#) to [B60B 23/10](#)

- B60B 23/02 . by split or other expansible ring devices
- B60B 23/04 . by bayonet joint, screw-thread, or like attachments
- B60B 23/06 . by screws, bolts, pins, or clips
- B60B 23/08 .. arranged radially
- B60B 23/10 .. arranged axially
- B60B 23/12 . by devices arranged to permit variation of axial position of rim relative to wheel body for track width adjustment

**B60B 25/00**

**Rims built up of several main parts** {**Locking means for the rim parts**} (tools for assembling divided rims [B60B 31/04](#))

- B60B 25/002 . {Rims split in circumferential direction}
- B60B 25/004 .. {one rim part comprising the wheel disc}
- B60B 25/006 .. {Rims split symmetrically}
- B60B 25/008 .. {comprising spacer means}
- B60B 25/02 . Segmented rims, e.g. with segments arranged in sections; Connecting equipment, e.g. hinges; Insertable flange rings therefor
- B60B 25/04 . Rims with dismountable flange rings, seat rings, or lock rings
- B60B 25/045 .. on both sides
- B60B 25/06 .. Split flange rings, e.g. transversely split; Connecting equipment for overlapping the slot
- B60B 25/08 .. Continuous flange rings; Arrangement of recesses enabling the flange rings to be slipped over the rim body
- B60B 25/10 .. Seat rings for the tyre bead part, e.g. split



- B60B 25/12 . . . with integral flange part
- B60B 25/14 . . Locking means for flange rings or seat rings
- B60B 25/16 . . . Arrangement of bayonet catches
- B60B 25/18 . . . Arrangement of split rings
- B60B 25/20 . . . Arrangement of screws, bolts, or shouldered pins
- B60B 25/22 . Other apurtenances, e.g. for sealing the component parts enabling the use of tubeless tyres

**B60B 27/00****Hubs** (non-metallic [B60B 5/00](#); of high resiliency [B60B 9/00](#))

- B60B 27/0005 . {with ball bearings}
- B60B 27/001 . {with roller-bearings}
- B60B 27/0015 . {for driven wheels}
- B60B 27/0021 . . {characterised by torque transmission means from drive axle}
- B60B 27/0026 . . . {of the radial type, e.g. splined key}
- B60B 27/0031 . . . {of the axial type, e.g. front teeth}
- B60B 27/0036 . . {comprising homokinetic joints}
- B60B 27/0042 . . . {characterised by the fixation of the homokinetic joint to the hub}
- B60B 27/0047 . {characterised by functional integration of other elements}
- B60B 27/0052 . . {the element being a brake disc}
- B60B 27/0057 . . {the element being a brake drum}
- B60B 27/0063 . . {the element being a brake caliper mount}
- B60B 27/0068 . . {the element being a sensor}
- B60B 27/0073 . {characterised by sealing means}
- B60B 27/0078 . {characterised by the fixation of bearings}
- B60B 27/0084 . . {caulking to fix inner race}
- B60B 27/0089 . . {caulking to fix outer race}
- B60B 27/0094 . {one or more of the bearing races are formed by the hub}
- B60B 27/02 . adapted to be rotatably arranged on axle
- B60B 27/023 . . {specially adapted for bicycles}
- B60B 27/026 . . . {comprising quick release devices}
- B60B 27/04 . . housing driving means, e.g. sprockets
- B60B 27/042 . . . {comprising a rotational dampers}
- B60B 27/045 . . . {comprising a spoke protectors}
- B60B 27/047 . . . {comprising a freewheel mechanisms}
- B60B 27/06 . adapted to be fixed on axle
- B60B 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](#))

- B60B 29/00**      **Apparatus or tools for mounting or dismounting wheels** {(mounting of wheels at assembly lines [B62D 65/12](#))}
- B60B 29/001      . {comprising lifting or aligning means ([B60B 29/002](#) takes precedence)}
  - B60B 29/002      . {provided with a dolly}
  - B60B 29/003      . {Wrenches, e.g. of the ratchet type ([B60B 29/001](#) takes precedence; wrenches per se [B25B 13/00](#))}
  - B60B 29/004      .. {for dual wheels}
  - B60B 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](#))}
  - B60B 29/006      .. {with electric or pneumatic drive (power-driven nut setting or loosening tool per se [B25B 21/00](#))}
  - B60B 29/007      .. {Supports for wrenches ([B60B 29/005](#), [B60B 29/006](#) take precedence)}
  - B60B 29/008      . {Wheel pullers; tools for axial movement of wheels (adjustable axle units for varying track [B60B 35/10](#))}

**B60B 30/00**      **Means for holding wheels or parts thereof** (spare wheel stowing, holding or mounting arrangements on vehicles [B62D 43/00](#))

- B60B 30/02      . engaging the tyre, e.g. the tyre being mounted on the wheel rim
- B60B 30/04      .. the tyre not being mounted on a rim, i.e. holders or supports for tyres alone
- B60B 30/06      . engaging the wheel body, e.g. the rim
- B60B 30/08      .. the central part of the wheel body
- B60B 30/10      . characterised by being provided on a dolly

**B60B 31/00**      **Apparatus or tools for assembling or disassembling wheels**

- B60B 31/005      . {especially for spoked wheels}
- B60B 31/02      . for tightening or straightening wire spokes in situ; for extracting spokes from wheels
- B60B 31/04      . for assembling divided rims
- B60B 31/06      . for removing or attaching cover discs, hub caps, or the like

**B60B 33/00**      **Castors in general; {Anti-clogging castors}** (castors for large containers [B65D 90/18](#))

- B60B 33/0002      . {assembling to the object, e.g. furniture}
- B60B 33/0005      .. {characterised by mounting method}
- B60B 33/0007      ... {by screwing}
- B60B 33/001      ... {by snapping, clicking or latching in}
- B60B 33/0013      ... {by straps, bands or similar}
- B60B 33/0015      .. {characterised by adaptations made to castor}
- B60B 33/0018      ... {in the form of a flat mounting plate}
- B60B 33/0021      ... {in the form of a mounting pin}

B60B 33/0023	...	{in the form of specific adaptations to the form of the object}
B60B 33/0026	..	{characterised by adaptations made to the object}
B60B 33/0028	.	{Construction of wheels; methods of assembling on axle}
B60B 2033/0031	..	{the axle being inclined}
B60B 2033/0034	.	{having means for blocking by gripping on the ground}
B60B 33/0036	.	{characterised by type of wheels}
B60B 33/0039	..	{Single wheels}
B60B 33/0042	..	{Double or twin wheels}
B60B 33/0044	..	{Roller type wheels, i.e. extra wide wheels}
B60B 33/0047	.	{characterised by details of the rolling axle}
B60B 33/0049	..	{the rolling axle being horizontal}
B60B 33/0052	..	{the rolling axle being inclined}
B60B 33/0055	..	{the rolling axle intersects swivel axis}
B60B 33/0057	..	{the rolling axle being offset from swivel axis}
B60B 33/006	.	{characterised by details of the swivel mechanism}
B60B 33/0063	..	{no swivelling action, i.e. no real caster}
B60B 33/0065	..	{characterised by details of the swivel axis}
B60B 33/0068	...	{the swivel axis being vertical}
B60B 33/0071	...	{the swivel axis being inclined}
B60B 33/0073	...	{the swivel axis being symmetrical to wheel or wheels}
B60B 33/0076	...	{the swivel axis being offset laterally from wheel center plane}
B60B 33/0078	.	{characterised by details of the wheel braking mechanism}
B60B 33/0081	..	{acting on tire tread}
B60B 33/0084	..	{acting on axle end}
B60B 33/0086	..	{acting on rim or side portion of tyre}
B60B 33/0089	..	{acting on the floor}
B60B 33/0092	..	{actuated remotely, e.g. by cable or electrically}
B60B 33/0094	..	{actuated automatically}
B60B 33/0097	..	{acting permanently, e.g. for increased security on low friction surfaces}
B60B 33/02	.	with disengageable swivel action, { i.e. comprising a swivel locking mechanism}
B60B 33/021	..	{combined with braking of castor wheel}
B60B 33/023	..	{by using friction}
B60B 33/025	..	{by using form-fit, e.g. front teeth}
B60B 33/026	..	{being actuated remotely, e.g. by cable or electrically}
B60B 33/028	..	{being actuated automatically}
B60B 33/04	.	adjustable {, e.g. in height; linearly shifting castors}
B60B 33/045	..	{mounted resiliently, by means of dampers}
B60B 33/06	..	mounted retractably
B60B 33/063	...	{by linear movement parallel to swivel axis}

- B60B 33/066 . . . {by use of a hinge and lever mechanism to swing wheel upwards relative to wheel mount}
- B60B 33/08 . Ball castors {(B60B 33/0028 takes precedence)}
- B60B 35/00** **Axle units; Parts thereof (steerable vehicle stub axles B62D) { Arrangements for lubrication of axles}**
  - B60B 35/001 . {Axles of the portal type, i.e. axles designed for higher ground clearance}
  - B60B 35/002 . {Axles of the low floor type, e.g. for low-floor city busses}
  - B60B 35/003 . {Steerable axles}
  - B60B 35/004 . {Mounting arrangements for axles}
    - B60B 35/005 .. {with adaptations at chassis structure}
    - B60B 35/006 .. {with mounting plates or consoles fitted to axles}
      - B60B 35/007 ... {for mounting suspension elements to axles}
      - B60B 35/008 ... {for mounting air suspension elements to axles}
    - B60B 35/009 . {adapted for tiltable wheels}
  - B60B 35/02 . Dead axles, i.e. not transmitting torque
    - B60B 35/025 .. {the wheels being removable}
  - B60B 35/04 .. straight
  - B60B 35/06 .. cranked
  - B60B 35/08 .. of closed hollow section
  - B60B 35/10 .. adjustable for varying track {(tools for axial movement of wheels on axles B60B 29/008)}
    - B60B 35/1009 ... {operated manually}
      - B60B 35/1018 .... {comprising a locking pin}
      - B60B 35/1027 .... {comprising a clamping mechanism}
    - B60B 35/1036 ... {operated with power assistance}
      - B60B 35/1045 .... {electrically}
      - B60B 35/1054 .... {hydraulically}
      - B60B 35/1063 .... {automatically dependent on operational state of the vehicle}
    - B60B 35/1072 ... {by transversally movable elements}
      - B60B 35/1081 .... {the element is a wheel}
      - B60B 35/109 .... {the element is an axle part}
  - B60B 35/12 . Torque-transmitting axles (independent suspension aspects B60G)
    - B60B 35/121 .. {Power-transmission from drive shaft to hub}
      - B60B 35/122 ... {using gearings}
        - B60B 35/124 .... {of the helical or worm type}
        - B60B 35/125 .... {of the planetary type}
      - B60B 35/127 ... {using universal joints}
        - B60B 35/128 .... {of the homokinetic or constant velocity type}
    - B60B 35/14 .. Composite or split, e.g. half- axles; Couplings between axle parts or sections
    - B60B 35/16 .. Axle housings

B60B 35/163	... {characterised by specific shape of the housing, e.g. adaptations to give space for other vehicle elements like chassis or exhaust system}
B60B 35/166	... {characterised by reinforcements, e.g. reinforcement ribs}
B60B 35/18	.. Arrangement of bearings
<b>B60B 37/00</b>	<b>Wheel-axle combinations, e.g. wheel sets</b> (units comprising multiple wheels arranged side-by-side <a href="#">B60B 11/00</a> ; rail vehicle axle-boxes <a href="#">B61F</a> )
B60B 37/02	. the wheels being integral with solid axles
B60B 37/04	. the wheels being rigidly attached to solid axles
B60B 37/06	. the wheels being integral with, or rigidly attached to, hollow axles
B60B 37/08	.. the hollow axles being rotatable around fixed axles
B60B 37/10	. the wheels being individually rotatable around the axles
B60B 37/12	. Axles with a fixed ground wheel and a loose wheel
<b>B60B 39/00</b>	<b>Increasing wheel adhesion</b> (wheels, wheel attachments or tyre attachments, designed for increasing traction <a href="#">B60B 15/00</a> , <a href="#">B60C</a> ; tyre constructions <a href="#">B60C</a> ; road surface conditioning to prevent slipperiness <a href="#">E01C</a> )
B60B 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> )}
B60B 39/006	.. {characterised by a control system for the actuation of the rotating chain wheel}
B60B 39/02	. Vehicle fittings for scattering or dispensing material in front of its wheels
B60B 39/021	.. {Details of the dispensing device}
B60B 39/022	... {related to reservoirs}
B60B 39/023	... {related to metering valves}
B60B 39/024	... {related to preconditioning of the dispensing materials}
B60B 39/025	... {related to the control system}
B60B 39/026	.. {the material being in gas form}
B60B 39/027	... {the gas being heated on purpose}
B60B 39/028	... {the gas being exhaust gas}
B60B 39/04	.. the material being granular, e.g. sand (combined control of sanding apparatus and brakes of rail vehicles <a href="#">B61H</a> )
B60B 39/06	... the dispensing being effected by mechanical means
B60B 39/08	... the dispensing being effected by fluid means
B60B 39/083	.... {dispensing being effected by liquid}
B60B 39/086	.... {dispensing being effected by gas}
B60B 39/10	... the dispensing being controlled electrically or electro-magnetically
B60B 39/12	.. the material being sheet-like or web-like
<b>B60B 2200/00</b>	<b>Type of product being used or applied</b> (kind of vehicle product being used or applied <a href="#">B60Y 2200/00</a> )
B60B 2200/20	. Furniture or medical appliances
B60B 2200/22	.. Chairs
B60B 2200/222	... Office chairs

B60B 2200/224	...	Arm chairs
B60B 2200/24	..	Beds
B60B 2200/242	...	Hospital beds
B60B 2200/26	..	Medical appliances
B60B 2200/40	.	Articles of daily use
B60B 2200/41	..	Waste bins
B60B 2200/43	..	Carts
B60B 2200/432	...	Shopping carts
B60B 2200/434	...	Wheel barrows
B60B 2200/45	..	Suitcases
B60B 2200/47	..	Physical activity equipment, e.g. leisure or sports articles
B60B 2200/49	..	Domestic appliances, e.g. vacuum cleaners

**B60B 2310/00****Manufacturing methods**

B60B 2310/20	.	Shaping
B60B 2310/202	..	by casting
B60B 2310/204	..	by moulding, e.g. injection moulding, i.e. casting of plastics material
B60B 2310/206	..	by stamping
B60B 2310/208	..	by forging
B60B 2310/2082	...	by swaging
B60B 2310/211	..	by folding or bending
B60B 2310/212	..	by drawing
B60B 2310/213	..	by punching
B60B 2310/214	..	by extrusion
B60B 2310/218	..	by hydroforming
B60B 2310/221	..	by magnetic pulse forming
B60B 2310/222	..	by twisting
B60B 2310/224	..	by rolling
B60B 2310/226	..	by cutting
B60B 2310/228	..	by machining
B60B 2310/231	..	by turning
B60B 2310/232	..	by milling
B60B 2310/234	..	by grinding
B60B 2310/238	..	by thermal spraying of molten material
B60B 2310/241	..	by weaving or knitting of fibers
B60B 2310/242	..	by laminating, e.g. fabrication of sandwich sheets
B60B 2310/30	.	joining
B60B 2310/302	..	by welding
B60B 2310/3021	...	by autogen welding
B60B 2310/3022	...	by spot welding, plug welding

B60B 2310/3023	...	by arc welding, e.g. inert gas arc welding
B60B 2310/3025	...	by thermal welding, e.g. friction, induction or ultrasonic welding
B60B 2310/3026	...	by laser welding
B60B 2310/3027	...	by electron beam welding
B60B 2310/3028	...	by magnetic pulse welding
B60B 2310/303	..	by soldering
B60B 2310/305	..	by screwing
B60B 2310/306	..	by clamping or wedging, e.g. by clamping inserts as joining means
B60B 2310/307	..	by removably mountable securing elements, e.g. circlips
B60B 2310/311	..	by riveting
B60B 2310/3112	...	by punch-riveting
B60B 2310/312	..	by hemming or seaming, e.g. by folding of the rim
B60B 2310/314	..	by deformation
B60B 2310/3142	..	by caulking
B60B 2310/316	..	by press-fitting, shrink-fitting
B60B 2310/318	..	by adhesive bonding, e.g. glueing
B60B 2310/321	..	by overmolding
B60B 2310/323	..	by coextrusion
B60B 2310/329	..	by splicing, e.g. of ropes
B60B 2310/50	.	Thermal treatment
B60B 2310/52	..	Curing
B60B 2310/54	..	Hardening
B60B 2310/542	...	Quenching
B60B 2310/56	..	Co-curing; Vulcanisation
B60B 2310/60	.	Surface treatment; After treatment
B60B 2310/612	..	Polishing
B60B 2310/614	..	Painting
B60B 2310/616	..	Coating with thin films
B60B 2310/6162	...	Conductive films
B60B 2310/618	..	Coating with foils
B60B 2310/621	..	Electro-chemical processes
B60B 2310/622	..	Shot-peening
B60B 2310/64	..	Effect of treatments
B60B 2310/642	...	Matted
B60B 2310/644	...	Polished
B60B 2310/646	...	Engraved
B60B 2310/648	...	Structured
B60B 2310/651	...	glossy
B60B 2310/652	...	Reflecting
B60B 2310/654	...	Anti-corrosive

- B60B 2310/656 . . . Decorative
- B60B 2310/658 . . . For advertising
- B60B 2310/661 . . . for protection, e.g. against scratches or stone chips
- B60B 2310/80 . Filament winding

#### **B60B 2320/00 Manufacturing or maintenance operations**

- B60B 2320/10 . Assembling; disassembling
- B60B 2320/12 .. Assembly devices for spoked wheels
  - B60B 2320/122 . . . for spoke tensioning
  - B60B 2320/124 . . . for trueing of spoked wheels
  - B60B 2320/126 . . . for restoring form or removing local distortions of wheel rims in unassembled state
- B60B 2320/14 .. Assembly devices for divided rims
- B60B 2320/16 .. Devices for attaching or removing cover discs, hub caps or other ornamental rings or elements
- B60B 2320/30 . Balancing
- B60B 2320/50 . Securing
  - B60B 2320/52 .. to prevent loss
    - B60B 2320/522 . . . by locking washer
    - B60B 2320/524 . . . by securing plate

#### **B60B 2340/00 Wheel transporting, Mounting of wheels**

- B60B 2340/10 . Operation mode
  - B60B 2340/12 .. Operated manually
  - B60B 2340/14 .. Power driven
  - B60B 2340/16 .. Included in assembly line
  - B60B 2340/18 .. Automated process
- B60B 2340/30 . Wheel transporting or handling devices
  - B60B 2340/32 .. for gripping the wheel
  - B60B 2340/34 .. for positioning the wheel to hub or boltholes
  - B60B 2340/36 .. the devices being provided on a dolly
- B60B 2340/50 . Wheel mounting or removal devices
  - B60B 2340/52 .. Auxiliary tools, e.g. For alignment
  - B60B 2340/70 . Lifting jacks

#### **B60B 2360/00 Materials; Physical forms thereof**

- B60B 2360/10 . Metallic materials
  - B60B 2360/102 .. Steel
  - B60B 2360/104 .. Aluminum
  - B60B 2360/106 .. Magnesia
  - B60B 2360/108 .. Titanium
  - B60B 2360/109 .. Bronze



B60B 2360/14	. Physical forms of metallic parts
B60B 2360/141	.. Sheet-metals
B60B 2360/143	.. Bars, i.e. being solid
B60B 2360/1432	... of circular cross section
B60B 2360/1434	... of polygonal cross section, e.g. triangular or rectangular
B60B 2360/1436	... of elliptical cross section
B60B 2360/144	.. Tubes, i.e. being hollow
B60B 2360/1442	... of circular cross section
B60B 2360/1444	... of rectangular cross section
B60B 2360/1446	... of elliptical cross section
B60B 2360/1448	... of irregular cross-section
B60B 2360/145	.. Profiles, i.e. being solid and having irregular cross-section
B60B 2360/1452	... L-profiles
B60B 2360/1454	... T or H-Profiles
B60B 2360/1456	... X or Y-Profiles
B60B 2360/1458	... U or V-Profiles
B60B 2360/147	.. Castings
B60B 2360/148	.. Sinterings
B60B 2360/149	.. Metal foams
B60B 2360/30	. Synthetic materials
B60B 2360/32	.. Plastic compositions
B60B 2360/322	... Comprising polypropylene
B60B 2360/324	... Comprising polyurethane
B60B 2360/33	.. Synthetic foams
B60B 2360/34	.. Reinforced plastics
B60B 2360/341	... with fibres
B60B 2360/3412	.... Glass fibres
B60B 2360/3414	.... Aramide fibres
B60B 2360/3416	.... Carbone fibres
B60B 2360/3418	.... Aramid fibres
B60B 2360/342	... With strands
B60B 2360/3422	.... consisting of fibres oriented substantially parallel
B60B 2360/3424	.... consisting of braided fibres
B60B 2360/344	... With woven material
B60B 2360/3442	.... characterised by material mixes
B60B 2360/3444	.... characterised by weaving patterns
B60B 2360/346	... Material impregnated with resin before being put into form, i.e. prepregs
B60B 2360/3462	.... comprising strands
B60B 2360/3464	.... comprising woven material
B60B 2360/348	... Resins

B60B 2360/36	.. Composite materials
B60B 2360/362	... Compounded sheets
B60B 2360/364	... comprising honeycomb structures
B60B 2360/366	... comprising foams, e.g. synthetic or metal foams
B60B 2360/368	... Coproduced material combinations, e.g. By over-molding, co-extrusion, co-curing or vulcanizing
B60B 2360/50	. Rubbers
B60B 2360/70	. Ceramics
B60B 2360/90	. Wood
B60B 2360/92	. Leather
B60B 2360/94	. Cardboard or papers
<b>B60B 2380/00</b>	<b>Bearings</b>
B60B 2380/10	. Type
B60B 2380/12	.. Ball bearings
B60B 2380/14	.. Roller bearings
B60B 2380/16	.. Needle bearings
B60B 2380/18	.. Plain or sleeve bearings
B60B 2380/20	.. Linear bearings
B60B 2380/22	.. Magnetic bearings
B60B 2380/30	. Cage
B60B 2380/32	.. Without cage
B60B 2380/40	. Modularity
B60B 2380/42	.. Single-piece
B60B 2380/44	.. Multi-piece
B60B 2380/50	. Load bearing capacity
B60B 2380/60	. Rolling elements
B60B 2380/62	.. Specific number
B60B 2380/64	.. Specific shape
B60B 2380/70	. Arrangements
B60B 2380/71	.. Single track
B60B 2380/73	.. Double track
B60B 2380/75	.. Twin or multiple bearings having identical diameters
B60B 2380/76	.. Twin or multiple bearings having different diameters
B60B 2380/77	.. Diameters of bearings at opposite ends of hub
B60B 2380/772	... Identical diameters of bearings at opposite ends of hub
B60B 2380/774	... Different diameters of bearings at opposite ends of hub
B60B 2380/80	. Shafts specially adapted to receive bearings
B60B 2380/82	.. Caulked to fix race
B60B 2380/90	. Casings or housings specially adapted to receive bearings
B60B 2380/92	.. Caulked to fix race

<b>B60B 2900/00</b>	<b>Purpose of invention</b>
B60B 2900/10	. Reduction of
B60B 2900/111	.. Weight
B60B 2900/112	.. Costs
B60B 2900/113	.. Production or maintenance time
B60B 2900/114	.. Size
B60B 2900/115	.. Complexity
B60B 2900/116	.. Product variety, e.g. by standardisation or use of adapters
B60B 2900/121	.. Resisting forces
B60B 2900/1212	... due to friction
B60B 2900/1214	... due to inertia
B60B 2900/1216	... due to air-drag
B60B 2900/131	.. Vibrations
B60B 2900/133	.. Noise
B60B 2900/141	.. Corrosions
B60B 2900/20	. Avoidance of
B60B 2900/211	.. Soiling
B60B 2900/212	.. Damage
B60B 2900/30	. Increase in
B60B 2900/311	.. Rigidity or stiffness
B60B 2900/313	.. Resiliency
B60B 2900/321	.. Lifetime
B60B 2900/323	.. Timespan between services
B60B 2900/325	.. Reliability
B60B 2900/331	.. Safety or security
B60B 2900/3312	... during regular use
B60B 2900/3313	... during maintenance
B60B 2900/3314	... during production or assembly
B60B 2900/3315	... by avoiding misuse
B60B 2900/3316	... by indicating wear, failure or loss
B60B 2900/3318	... by theft prevention
B60B 2900/351	.. versatility, e.g. usable for different purposes or different arrangements
B60B 2900/50	. Improvement of
B60B 2900/511	.. Sealing
B60B 2900/5112	... against dust or dirt
B60B 2900/5114	... against humidity or water
B60B 2900/5116	... against air-loss
B60B 2900/5118	... against oil-loss
B60B 2900/513	.. Cooling, e.g. of brakes

<a href="#">B60B 2900/521</a>	..	Tire mounting or removal ( <a href="#">devices therefor B60B 2340/50</a> )
<a href="#">B60B 2900/523</a>	..	Tire fixation on rim, e.g. fixing axially or circumferentially thereon
<a href="#">B60B 2900/531</a>	..	User-friendliness
<a href="#">B60B 2900/541</a>	..	Servicing
<a href="#">B60B 2900/551</a>	..	Handling of obstacles or difficult terrains
<a href="#">B60B 2900/561</a>	..	Lubrication
<a href="#">B60B 2900/571</a>	..	Visibility
<a href="#">B60B 2900/572</a>	..	Visual appearance
<a href="#">B60B 2900/70</a>	.	Adaptation for
<a href="#">B60B 2900/711</a>	..	High loads, e.g. by reinforcements
<a href="#">B60B 2900/721</a>	..	Use under adverse external conditions
<a href="#">B60B 2900/731</a>	..	Use in cases of damage, failure or emergency
<a href="#">B60B 2900/90</a>	.	Providing or changing
<a href="#">B60B 2900/911</a>	..	Eccentricity
<a href="#">B60B 2900/921</a>	..	Conductivity
<a href="#">B60B 2900/931</a>	..	Magnetic effects