CPC  Cooperative Patent Classification

B  Performing Operations; Transporting

(NOTE 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 39/001)

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 takes 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 17/00061)

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

3/041  . . . { i.e. disc body and rim being manufactured independently and then permanently attached to each other in a second step, e.g. by welding }

3/044  . { 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 }

CPC - 2019.05

1
Wheels

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 spoke 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
disks 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
disks 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}
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]

Wheels

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]

Wheels characterised by rail-engaging elements ((wheel-axle combinations B60B 17/00; of model railways A63H 19/22))
17/0003 . . [Wheel bodies characterised by use of non-metallic material (B60B 17/00/34 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]

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 11/10; 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]
Rims; Hubs

27/00 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 expandable 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 thereto
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 head 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 appurtenances, 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]
27/0001 . . [with roller-bearing]
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]
27/002 . . adapted to be rotatably arranged on axle
27/0023 . . . . [specially adapted for bicycles]
27/0026 . . . . [comprising quick release devices]
27/004 . . housing driving means, e.g. sprockets
27/0042 . . . . [comprising a rotational dampers]
27/0045 . . . . [comprising a spoke protectors]
27/0047 . . . . [comprising a freewheel mechanisms]
27/006 . . adapted to be fixed on axle
27/0065 . . . . [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 multiplicated 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
Apparatus or tools for mounting wheels or parts thereof

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 buses]
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
Apparatus or tools for mounting wheels or parts thereof

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)

39/003 . . . [Vehicle mounted non-skid chains actuated by centrifugal force (non-skid devices temporarily attachable to resilient tyres B60C 27/00)]

39/006 . . . [characterised by a control system for the actuation of the rotating chain wheel]

39/02 Vehicle fittings for scattering or dispensing material in front of its wheels

39/021 . . . [Details of the dispensing device]
39/022 . . . [related to reservoirs]
39/023 . . . [related to metering valves]
39/024 . . . [related to preconditioning of the dispensing materials]
39/025 . . . [related to the control system]
39/026 . . . [the material being in gas form]
39/027 . . . [the gas being heated on purpose]
39/028 . . . [the gas being exhaust gas]
39/04 the material being granular, e.g. sand (combined control of sanding apparatus and brakes of rail vehicles B61H)

39/06 . . . the dispensing being effected by mechanical means
39/08 . . . the dispensing being effected by fluid means
39/083 . . . [dispensing being effected by liquid]
39/086 . . . [dispensing being effected by gas]
39/10 . . . the dispensing being controlled electrically or electromagnetically
39/12 . . . the material being sheet-like or web-like

2200/00 Type of product being used or applied (kind of vehicle product being used or applied B60Y 2200/00)

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
2310/213 . . . by punching
2310/214 . . . by extrusion
2310/218 . . . by hydroforming
2310/221 . . . by magnetic pulse forming
2310/222 . . . by twisting
2310/224 . . . by rolling
2310/226 . . . by cutting
2310/228 . . . by machining
2310/231 . . . by turning
2310/232 . . . by milling
2310/234 . . . by grinding
2310/238 . . . by thermal spraying of molten material
2310/241 . . . by weaving or knitting of fibers
2310/242 . . . by laminating, e.g. fabrication of sandwich sheets
2310/250 . . . joining
2310/302 . . . by welding
2310/3021 . . . by autogen welding
2310/3022 . . . by spot welding, plug welding
2310/3023 . . . by arc welding, e.g. inert gas arc welding
2310/3025 . . . by thermal welding, e.g. friction, induction or ultrasonic welding
2310/3026 . . . by laser welding
2310/3027 . . . by electron beam welding
2310/3028 . . . by magnetic pulse welding
2310/303 . . . by soldering
2310/305 . . . by screwing
2310/306 . . . by clamping or wedging, e.g. by clamping inserts as joining means
2310/307 . . . by removably mountable securing elements, e.g. circlips
2310/311 . . . by riveting
2310/312 . . . 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. gluing
2310/321 . . . by overmolding
2310/323 . . . by coextrusion
2310/329 . . . by splicing, e.g. of ropes
2310/350 . . . 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 . . . Mattet
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
2310/80 . . Filament winding

2320/00 Manufacturing or maintenance operations
2320/10 . . Assembling; disassembling
2320/12 . . Assembly devices for spoked wheels
2320/12 . . for spoke tensioning
2320/12 . . for trueing of spoked wheels
2320/126 . . for restoring form or removing local distortions of wheel rims in unassembled state
2320/14 . . Assembly devices for divided rims
2320/16 . . Devices for attaching or removing cover discs, hub caps or other ornamental rings or elements
2320/30 . . Balancing
2320/50 . . Securing
2320/52 . . to prevent loss
2320/52 . .2 by locking washer
2320/52 . .2 by securing plate

2340/00 Wheel transporting, Mounting of wheels
2340/10 . . Operation mode
2340/12 . . Operated manually
2340/14 . . Power driven
2340/16 . . Included in assembly line
2340/18 . . Automated process
2340/30 . . Wheel transporting or handling devices
2340/32 . . for gripping the wheel
2340/34 . . for positioning the wheel to hub or bolt holes
2340/36 . . the devices being provided on a dolly
2340/50 . . Wheel mounting or removal devices
2340/52 . . Auxiliary tools, e.g. For alignment
2340/70 . . Lifting jacks

2360/00 Materials; Physical forms thereof
2360/10 . . Metallic materials
2360/102 . . Steel
2360/104 . . Aluminum
2360/106 . . Magnesia
2360/108 . . Titanium
2360/109 . . Bronze
2360/14 . . Physical forms of metallic parts
2360/141 . . Sheet-metals
2360/143 . . Bars, i.e. being solid
2360/1432 . . of circular cross section
2360/1434 . . of polygonal cross section, e.g. triangular or rectangular
2360/1436 . . of elliptical cross section
2360/144 . . Tubes, i.e. being hollow
2360/1442 . . of circular cross section
2360/1444 . . of rectangular cross section
2360/1446 . . of elliptical cross section
2360/1448 . . of irregular cross-section
2360/145 . . Profiles, i.e. being solid and having irregular cross-section
2360/1452 . . L-profiles
2360/1454 . . T or H-Profiles
2360/1456 . . X or Y-Profiles
2360/1458 . . U or V-Profiles
2360/147 . . Castings

2361/48 . . . Sinterings
2361/49 . . . Metal foams
2361/30 . . . Synthetic materials
2361/32 . . . Plastic compositions
2361/322 . . . Comprising polypropylene
2361/324 . . . Comprising polyurethane
2361/33 . . . Synthetic foams
2361/34 . . . Reinforced plastics
2361/341 . . . with fibres
2361/3412 . . . Glass fibres
2361/3414 . . . Aramide fibres
2361/3416 . . . Carbone fibres
2361/3418 . . . Aramid fibres
2361/342 . . . With strands
2361/3422 . . . consisting of fibres oriented substantially parallel
2361/3424 . . . consisting of braided fibres
2361/344 . . . With woven material
2361/3442 . . . characterised by material mixes
2361/3444 . . . characterised by weaving patterns
2361/346 . . . Material impregnated with resin before being put into form, i.e. prepreps
2361/3462 . . . comprising strands
2361/3464 . . . comprising woven material
2361/348 . . . Resins
2361/36 . . . Composite materials
2361/362 . . . Compound sheets
2361/364 . . . comprising honeycomb structures
2361/366 . . . comprising foams, e.g. synthetic or metal foams
2361/368 . . . Coproduced material combinations, e.g. By over-molding, co-extrusion, co-curing or vulcanizing

2360/50 . . . Rubbers
2360/70 . . . Ceramics
2360/90 . . . Wood
2360/92 . . . Leather
2360/94 . . . Cardboard or papers

2380/00 Bearings
2380/10 . . . Type
2380/12 . . . Ball bearings
2380/14 . . . Roller bearings
2380/16 . . . Needle bearings
2380/18 . . . Plain or sleeve bearings
2380/20 . . . Linear bearings
2380/22 . . . Magnetic bearings
2380/30 . . . Cage
2380/32 . . . Without cage
2380/40 . . . Modularity
2380/42 . . . Single-piece
2380/44 . . . Multi-piece
2380/50 . . . Load bearing capacity
2380/60 . . . Rolling elements
2380/62 . . . Specific number
2380/64 . . . Specific shape
2380/70 . . . Arrangements
2380/71 . . . Single track
2380/73 . . . Double track
2380/75 . . . Twin or multiple bearings having identical diameters

CPC - 2019.05
### Twin or multiple bearings
- **2380/76** Twin or multiple bearings having different diameters
- **2380/77** Diameters of bearings at opposite ends of hub
- **2380/772** Identical diameters of bearings at opposite ends of hub
- **2380/774** Different diameters of bearings at opposite ends of hub

### Shafts
- **2380/80** Shafts specially adapted to receive bearings
- **2380/82** Caulked to fix race

### Casings or housings
- **2380/90** Casings or housings specially adapted to receive bearings
- **2380/92** Caulked to fix race

### Purpose of invention

#### 2900/00

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>2900/10</td>
<td>Reduction of</td>
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<tr>
<td>2900/111</td>
<td>Weight</td>
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<tr>
<td>2900/112</td>
<td>Costs</td>
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<tr>
<td>2900/113</td>
<td>Production or maintenance time</td>
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<tr>
<td>2900/114</td>
<td>Size</td>
</tr>
<tr>
<td>2900/115</td>
<td>Complexity</td>
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<tr>
<td>2900/116</td>
<td>Product variety, e.g. by standardisation or use of adapters</td>
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<tr>
<td>2900/121</td>
<td>Resisting forces</td>
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<tr>
<td>2900/1212</td>
<td>due to friction</td>
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<tr>
<td>2900/1214</td>
<td>due to inertia</td>
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<tr>
<td>2900/1216</td>
<td>due to air-drag</td>
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<tr>
<td>2900/131</td>
<td>Vibrations</td>
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<td>2900/133</td>
<td>Noise</td>
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<td>2900/30</td>
<td>Increase in</td>
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<td>Rigidity or stiffness</td>
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<td>Resiliency</td>
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<td>2900/321</td>
<td>Lifetime</td>
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<td>Timespan between services</td>
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<td>Reliability</td>
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<td>2900/331</td>
<td>Safety or security</td>
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<td>during regular use</td>
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<td>during maintenance</td>
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<td>during production or assembly</td>
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<tr>
<td>2900/3315</td>
<td>by avoiding misuse</td>
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<td>2900/3316</td>
<td>by indicating wear, failure or loss</td>
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<td>2900/3318</td>
<td>by theft prevention</td>
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<tr>
<td>2900/351</td>
<td>versatility, e.g. usable for different purposes or different arrangements</td>
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#### 2900/50

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<td>2900/5118</td>
<td>against oil-loss</td>
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<td>2900/513</td>
<td>Cooling, e.g. of brakes</td>
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<tr>
<td>2900/521</td>
<td>Tire mounting or removal (devices therefor)</td>
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<tr>
<td>2900/523</td>
<td>Tire fixation on rim, e.g. fixing axially or circumferentially thereon</td>
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<tr>
<td>2900/531</td>
<td>User-friendliness</td>
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<tr>
<td>2900/541</td>
<td>Servicing</td>
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<tr>
<td>2900/551</td>
<td>Handling of obstacles or difficult terrains</td>
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<tr>
<td>2900/561</td>
<td>Lubrication</td>
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