CPC COOPERATIVE PATENT CLASSIFICATION

B60C VEHICLE TYRES (manufacture B29); TYRE INFLATION; TYRE CHANGING OR REPAIRING; REPAIRING, OR CONNECTING VALVES TO, INFLATABLE ELASTIC BODIES IN GENERAL; DEVICES OR ARRANGEMENTS RELATED TO TYRES (testing of tyres G01M 17/02)

NOTES

1. In this subclass, the term "tyre" is to be understood as a separate ground-engaging, continuous element outside the periphery of the wheel rim and includes the tyre casing, cover, or jacket and any insert, e.g. inner tube. In the groups relating to repair or connection of valves, the term "tyre" is to be understood to include also inflatable elastic bodies other than tyres or inner tubes
2. Attention is drawn to the note following the title of class B60.

WARNING

The following IPC groups are not used in the CPC scheme. Subject matter covered by these groups is classified in the following CPC groups:

B60C 11/113	covered by	B60C 11/0311
B60C 11/117	covered by	B60C 11/032

1/00 Tyres characterised by the chemical composition or the physical arrangement or mixture of the composition

NOTE

Tyres characterised by compositions only, i.e. having no significant tyre structure, are classified only with the compositions, e.g. C08K, C08L

1/0008 . {Compositions of the inner liner}
1/0016 . {Compositions of the tread}
1/0025 . {Compositions of the sidewalls}
2001/0033 . {Compositions of the sidewall inserts, e.g. for runflat}
1/0041 . {Compositions of the carcass layers}
2001/005 . {Compositions of the bead portions, e.g. clinch or chafer rubber or cushion rubber}
2001/0058 . . {Compositions of the bead apexes}
2001/0066 . {Compositions of the belt layers}
2001/0075 . {Compositions of belt cushioning layers}
2001/0083 . {Compositions of the cap ply layers}
2001/0091 . {Compositions of non-inflatable or solid tyres}

3/00 Tyres characterised by the transverse section (characterised by rail-engaging elements B60B 17/00)

2003/005 . {Twin tyres}
3/02 . Closed, e.g. toroidal, tyres
3/04 . characterised by the relative dimensions of the section, e.g. low profile (B60C 3/06 takes precedence)
3/06 . Asymmetric {(asymmetric bead seats B60C 15/0236; asymmetric bead reinforcement B60C 2015/0696)}
3/08 . collapsible into storage or non-use condition, e.g. space-saving spare tyres (run-flat tyres B60C 17/08)

5/00 Inflatable pneumatic tyres or inner tubes (B60C 1/00, B60C 9/00 - B60C 17/00 take precedence)

5/001 . {filled with gas other than air}
5/002 . {filled at least partially with foam material}
5/004 . {filled at least partially with liquid (B60C 19/12 takes precedence)}
5/005 . . {Ballast tyres}
5/007 . {made from other material than rubber}
5/008 . {Low pressure tyres, e.g. for all terrain vehicles}
5/01 . without substantial cord reinforcement, e.g. cordless tyres, cast tyres
5/02 . having separate inflatable inserts, e.g. with inner tubes; Means for lubricating, venting, preventing relative movement between tyre and inner tube (B60C 5/20 takes precedence)
5/025 . . {separated by a part of the tyre (inflatable inserts with several inflatable chambers B60C 5/20)}
5/04 . . Shape or construction of inflatable inserts (B60C 5/10 takes precedence)
5/08 . . . having reinforcing means
5/10 . . . formed as a single discontinuous ring with contiguous ends which may be connected together
5/12 . without separate inflatable inserts, e.g. tubeless tyres with transverse section open to the rim (B60C 5/20 takes precedence)
5/14 . . with impervious liner or coating on the inner wall of the tyre (**B60C21/04**, **B60C21/08** take precedence)
5/142 . . . {provided partially, i.e. not covering the whole inner wall}
2005/145 . . . {made of laminated layers}
2005/147 . . . {characterised by the joint or splice}
5/16 . . Sealing means between beads and rims, e.g. bands
5/18 . Sectional casings, e.g. comprising replaceable arcuate parts
5/20 . having multiple separate inflatable chambers (with additional tubes which become load supporting in emergency B60C 17/02)
5/22 . . the chambers being annular
5/24 . . the walls of the chambers extending transversely of the tyre

7/00 Non-inflatable or solid tyres (B60C 1/00 takes precedence; tyres or rims characterised by rail engaging elements B60B 17/00)

2007/005 . {made by casting, e.g. of polyurethane}

7/02 . made from ropes or bristles
7/04 . made of wood or leather
7/06 . made of metal
7/08 . built-up from a plurality of arcuate parts
7/10 . characterised by means for increasing resiliency (highly resilient wheels B60B 9/00)
7/102 . . {Tyres built-up with separate rubber parts}
7/105 . . {using foam material}
2007/107 . . {comprising lateral openings}
7/12 . . using enclosed chambers, e.g. gas-filled (inflatable tyres B60C 5/00)
7/125 . . . {enclosed chambers defined between rim and tread}
7/14 . . using springs
7/143 . . . {having a lateral extension disposed in a plane parallel to the wheel axis}
2007/146 . . . {extending substantially radially, e.g. like spokes}
7/16 . . . of helical or flat coil form
7/18 . . . . disposed radially relative to wheel axis
7/20 . . . . disposed circumferentially relative to wheel axis
7/22 . having inlays other than for increasing resiliency, e.g. for armouring
7/24 . characterised by means for securing tyres on rim or wheel body
7/26 . . using bolts
7/28 . . using straps or the like, e.g. vulcanised into the tyre

9/00 Reinforcements or ply arrangement of pneumatic tyres (inserts having reinforcing means B60C 5/08; bead structure, e.g. turnup or overlap construction, B60C 15/00; tyre cords per se D02G 3/48; fabrics per se D03D, D04H; metal ropes or cables per se D07B 1/06) **{B}**

NOTE

When classifying in this group, classification is also made in subclass B32B insofar as any layered product is concerned

9/0007 . {Reinforcements made of metallic elements, e.g. cords, yarns, filaments or fibres made from metal}
2009/0014 . . {Surface treatments of steel cords}
2009/0021 . . {Coating rubbers for steel cords}
9/0028 . {Reinforcements comprising mineral fibres, e.g. glass or carbon fibres}
2009/0035 . {Reinforcements made of organic materials, e.g. rayon, cotton or silk}
9/0042 . {Reinforcements made of synthetic materials}
9/005 . {Reinforcements made of different materials, e.g. hybrid or composite cords}
9/0057 . {Reinforcements comprising preshaped elements, e.g. undulated or zig-zag filaments}
9/0064 . {Reinforcements comprising monofilaments}
2009/0071 . {characterised by special physical properties of the reinforcements}
2009/0078 . . {Modulus}
2009/0085 . . {Tensile strength}
2009/0092 . . {Twist structure}
9/02 . Carcasses
9/0207 . . {Carcasses comprising an interrupted ply, i.e. where the carcass ply does not continuously extend from bead to bead but is interrupted, e.g. at the belt area, into two or more portions of the same ply}
2009/0215 . . {Partial carcass reinforcing plies, i.e. the plies neither crossing the equatorial plane nor folded around the bead core}
2009/0223 . . {comprising a cushion layer between adjacent carcass plies}
9/023 . . {built up from narrow strips, individual cords or filaments, e.g. using filament winding}
9/0238 . . {characterised by special physical properties of the carcass ply}
2009/0246 . . . {Modulus of the ply}
2009/0253 . . . . {being different between adjacent plies}
2009/0261 . . . . {being different within the same ply}
2009/0269 . . {Physical properties or dimensions of the carcass coating rubber}
2009/0276 . . . {Modulus; Hardness; Loss modulus or "tangens delta"}
2009/0284 . . . {Thickness}
9/0292 . . {Carcass ply curvature (sidewall curvature B60C 13/003)}
9/04 . . the reinforcing cords of each carcass ply arranged in a substantially parallel relationship
2009/0408 . . . {Carcass joints or splices}
2009/0416 . . . {Physical properties or dimensions of the carcass cords}
2009/0425 . . . . {Diameters of the cords; Linear density thereof}
2009/0433 . . . . {Modulus}
2009/0441 . . . . {Density in width direction}
2009/045 . . . . {Tensile strength}
2009/0458 . . . . {Elongation of the reinforcements at break point}
2009/0466 . . . . {Twist structures}
2009/0475 . . . {Particular materials of the carcass cords}
2009/0483 . . . {Different cords in the same layer}
2009/0491 . . . {with special path of the carcass cords, e.g. sinusoidal}
9/06 . . . the cords extend diagonally from bead to bead and run in opposite directions in each successive carcass ply, i.e. bias angle ply (B60C 9/07, B60C 9/09 take precedence)
9/07 . . . the cords curve from bead to bead in plural planes, e.g. S-shaped cords
9/08 . . . the cords extend transversely from bead to bead, i.e. radial ply (B60C 9/07 takes precedence)
9/09 . . . . combined with other carcass plies having cords extending diagonally from bead to bead, i.e. combined radial ply and bias angle ply
9/10 . . the reinforcing cords within each carcass ply arranged in a crossing relationship
9/11 . . . Woven, braided, or knitted plies
9/12 . . built-up with rubberised layers of discrete fibres or filaments
9/13 . . . with two or more differing cord materials
9/14 . . built-up with sheets, webs, or films of homogeneous material, e.g. synthetics, sheet metal, rubber
2009/145 . . . {at the inner side of the carcass structure}

9/16 . . built-up with metallic reinforcing inlays
9/17 . . asymmetric to the midcircumferential plane of the tyre
9/18 . Structure or arrangement of belts or breakers, crown-reinforcing or cushioning layers
9/1807 . . {comprising fabric reinforcements}
2009/1814 . . . {square woven}
9/1821 . . {comprising discrete fibres or filaments}
2009/1828 . . {characterised by special physical properties of the belt ply}
9/1835 . . {Rubber strips or cushions at the belt edges (compositions B60C 2001/0075)}
2009/1842 . . . {Width or thickness of the strips or cushions}
9/185 . . . {between adjacent or radially below the belt plies}
2009/1857 . . . {radially above the belt plies}
2009/1864 . . . {wrapped around the edges of the belt}
2009/1871 . . {with flat cushions or shear layers between belt layers}
2009/1878 . . {with flat cushions or shear layers between the carcass and the belt}
2009/1885 . . {with belt ply between adjacent carcass plies}
2009/1892 . . {with belt ply radial inside the carcass structure}
9/20 . . built-up from rubberised plies each having all cords arranged substantially parallel
9/2003 . . . {characterised by the materials of the belt cords}
9/2006 . . . . {consisting of steel cord plies only}
9/2009 . . . . {comprising plies of different materials}
2009/2012 . . . {with particular configuration of the belt cords in the respective belt layers}
2009/2016 . . . . {comprising cords at an angle of 10 to 30 degrees to the circumferential direction}
2009/2019 . . . . {comprising cords at an angle of 30 to 60 degrees to the circumferential direction}
2009/2022 . . . . {comprising cords at an angle of 60 to 90 degrees to the circumferential direction}
2009/2025 . . . . {with angle different or variable in the same layer}
2009/2029 . . . . {with different cords in the same layer, i.e. cords with different materials or dimensions}
2009/2032 . . . . {characterised by the course of the belt cords, e.g. undulated or sinusoidal}
2009/2035 . . . {built-up by narrow strips}
2009/2038 . . . {using lateral belt strips at belt edges, e.g. edge bands}
2009/2041 . . . {with an interrupted belt ply, e.g. using two or more portions of the same ply}
2009/2045 . . . {with belt joints or splices}
2009/2048 . . . {characterised by special physical properties of the belt plies}
2009/2051 . . . . {Modulus of the ply}
2009/2054 . . . . . {being different within the same ply}
2009/2058 . . . . . {being different between adjacent plies}
2009/2061 . . . {Physical properties or dimensions of the belt coating rubber}
2009/2064 . . . . {Modulus; Hardness; Loss modulus or "tangens delta"}
2009/2067 . . . . {Thickness}
2009/207 . . . . {Double layers, e.g. using different rubbers in the same belt ply}
2009/2074 . . . {Physical properties or dimension of the belt cord}
2009/2077 . . . . {Diameters of the cords; Linear density thereof}
2009/208 . . . . {Modulus of the cords}
2009/2083 . . . . {Density in width direction}
2009/2087 . . . . . {with variable density in the same layer}
2009/209 . . . . {Tensile strength}
2009/2093 . . . . {Elongation of the reinforcements at break point}
2009/2096 . . . . {Twist structures}
9/22 . . . the plies being arranged with all cords disposed along the circumference of the tyre
9/2204 . . . . {obtained by circumferentially narrow strip winding}
2009/2209 . . . . . {characterised by tension of the cord during winding}
2009/2214 . . . . {characterised by the materials of the zero degree ply cords}
2009/2219 . . . . {with a partial zero degree ply at the belt edges - edge band}
2009/2223 . . . . {with an interrupted zero degree ply, e.g. using two or more portions for the same ply}
2009/2228 . . . . {characterised by special physical properties of the zero degree plies}
2009/2233 . . . . . {Modulus of the zero degree ply}
2009/2238 . . . . {Physical properties or dimensions of the ply coating rubber}
2009/2242 . . . . . {Modulus; Hardness; Loss modulus or "tangens delta"}
2009/2247 . . . . . {Thickness}
2009/2252 . . . . {Physical properties or dimension of the zero degree ply cords}
2009/2257 . . . . . {Diameters of the cords; Linear density thereof}
2009/2261 . . . . . {Modulus of the cords}
2009/2266 . . . . . {Density of the cords in width direction}
2009/2271 . . . . . {with variable density}
2009/2276 . . . . . {Tensile strength}
2009/228 . . . . . {Elongation of the reinforcements at break point}
2009/2285 . . . . . {Twist structures}
2009/229 . . . . . {characterised by the course of the cords, e.g. undulated or sinusoidal}
2009/2295 . . . . . {with different cords in the same layer}
9/24 . . built-up of arcuate parts
9/26 . . Folded plies
9/263 . . . {further characterised by an endless zigzag configuration in at least one belt ply, i.e. no cut edge being present}
2009/266 . . . . {combined with non folded cut-belt plies}
9/28 . . characterised by the belt or breaker dimensions or curvature relative to carcass (B60C 9/30 takes precedence)
2009/283 . . . {characterised by belt curvature}
2009/286 . . . . {being substantially flat}
9/30 . . asymmetric to the midcircumferential plane of the tyre

11/00 Tyre tread bands; Tread patterns; Anti-skid inserts

11/0008 . {characterised by the tread rubber}
2011/0016 . . {Physical properties or dimensions}
2011/0025 . . . {Modulus or tan delta}
2011/0033 . . . {Thickness of the tread}
11/0041 . {comprising different tread rubber layers}

11/005 . . {with cap and base layers}
11/0058 . . . {with different cap rubber layers in the axial direction}
11/0066 . . . . {having an asymmetric arrangement}
11/0075 . . . {with different base rubber layers in the axial direction}
11/0083 . {characterised by the curvature of the tyre tread}
2011/0091 . {built-up by narrow strip winding}
11/01 . Shape of the shoulders between tread and sidewall, e.g. rounded, stepped, cantilevered (arrangements of grooves or ribs on the sidewalls B60C 13/02)
2011/013 . . {provided with a recessed portion}
2011/016 . . {different rubber for tread wings}
11/02 . Replaceable treads
11/03 . Tread patterns
11/0302 . . {directional pattern, i.e. with main rolling direction}
11/0304 . . {Asymmetric patterns}
11/0306 . . {Patterns comprising block rows or discontinuous ribs}
11/0309 . . . {further characterised by the groove cross-section}
11/0311 . . {Patterns comprising tread lugs arranged parallel or oblique to the axis of rotation}
2011/0313 . . . {directional type}
11/0316 . . . {further characterised by the groove cross-section}
11/0318 . . {irregular patterns with particular pitch sequence}
11/032 . . {Patterns comprising isolated recesses}
11/0323 . . . {tread comprising channels under the tread surface, e.g. for draining water}
2011/0325 . . {Irregular patterns with particular pitch sequence}
11/0327 . . {characterised by special properties of the tread pattern}
11/033 . . . {by the void or net-to-gross ratios of the patterns}
11/0332 . . . {by the footprint-ground contacting area of the tyre tread}
2011/0334 . . . {Stiffness}
2011/0337 . . {characterised by particular design features of the pattern}
2011/0339 . . . {Grooves}
2011/0341 . . . . {Circumferential grooves}
2011/0344 . . . . . {provided at the equatorial plane}
2011/0346 . . . . . {with zigzag shape}
2011/0348 . . . . . {Narrow grooves, i.e. having a width of less than 4 mm}
2011/0351 . . . . . {Shallow grooves, i.e. having a depth of less than 50% of other grooves}
2011/0353 . . . . . {characterised by width}
2011/0355 . . . . . {characterised by depth}
2011/0358 . . . . {Lateral grooves, i.e. having an angle of 45 to 90 degees to the equatorial plane}
2011/036 . . . . . {Narrow grooves, i.e. having a width of less than 3 mm}
2011/0362 . . . . . {Shallow grooves, i.e. having a depth of less than 50% of other grooves}
2011/0365 . . . . . {characterised by width}
2011/0367 . . . . . {characterised by depth}
2011/0369 . . . . . {with varying depth of the groove}
2011/0372 . . . . . {with particular inclination angles}
2011/0374 . . . . {Slant grooves, i.e. having an angle of about 5 to 35 degrees to the equatorial plane}
2011/0376 . . . . . {characterised by width}
2011/0379 . . . . . {characterised by depth}
2011/0381 . . . . {Blind or isolated grooves}
2011/0383 . . . . . {at the centre of the tread}
2011/0386 . . . {Continuous ribs}
2011/0388 . . . . {provided at the equatorial plane}
2011/039 . . . . {provided at the shoulder portion}
2011/0393 . . . . {Narrow ribs, i.e. having a rib width of less than 8 mm}
2011/0395 . . . . . {for linking shoulder blocks}
2011/0397 . . . . {Sacrificial ribs, i.e. ribs recessed from outer tread contour}
11/04 . . in which the raised area of the pattern consists only of continuous circumferential ribs, e.g. zig-zag (B60C 11/12, B60C 11/13 take precedence)
11/042 . . . {further characterised by the groove cross-section}
11/045 . . . . {the groove walls having a three-dimensional shape}
11/047 . . . . {the groove bottom comprising stone trapping protection elements, e.g. ribs}
11/11 . . in which the raised area of the pattern consists only of isolated elements, e.g. blocks (B60C 11/12, B60C 11/13 take precedence)
11/12 . . characterised by the use of narrow slits or incisions, e.g. sipes
11/1204 . . . {with special shape of the sipe}
2011/1209 . . . . {straight at the tread surface}
2011/1213 . . . . {sinusoidal or zigzag at the tread surface}
11/1218 . . . . {Three-dimensional shape with regard to depth and extending direction}
11/1222 . . . . {Twisted or warped shape in the sipe plane}
2011/1227 . . . . {having different shape within the pattern}
2011/1231 . . . . {being shallow, i.e. sipe depth of less than 3 mm}
11/1236 . . . {with special arrangements in the tread pattern}
11/124 . . . . {inclined with regard to a plane normal to the tread surface}
2011/1245 . . . . {being arranged in crossing relation, e.g. sipe mesh}
11/125 . . . . {arranged at the groove bottom}
2011/1254 . . . . {with closed sipe, i.e. not extending to a groove}
11/1259 . . . {Depth of the sipe}
11/1263 . . . . {different within the same sipe}
2011/1268 . . . . {being different from sipe to sipe}
11/1272 . . . {Width of the sipe}
2011/1277 . . . . {being narrow, i.e. less than 0.3 mm}
11/1281 . . . . {different within the same sipe, i.e. enlarged width portion at sipe bottom or along its length}
2011/1286 . . . . {being different from sipe to sipe}
2011/129 . . . {Sipe density, i.e. the distance between the sipes within the pattern}
2011/1295 . . . . {variable}
11/13 . . characterised by the groove cross-section, e.g. for buttressing or preventing stone-trapping
11/1307 . . . {with special features of the groove walls}
11/1315 . . . . {having variable inclination angles, e.g. warped groove walls}
11/1323 . . . . {asymmetric}
2011/133 . . . . {comprising recesses}
2011/1338 . . . . {comprising protrusions}

11/1346 . . . . {covered by a rubber different from the tread rubber}
11/1353 . . . {with special features of the groove bottom}
2011/1361 . . . . {with protrusions extending from the groove bottom}
11/1369 . . . {Tie bars for linking block elements and bridging the groove}
11/1376 . . . {Three dimensional block surfaces departing from the enveloping tread contour}
11/1384 . . . . {with chamfered block corners}
11/1392 . . . . {with chamfered block edges}
11/14 . Anti-skid inserts, e.g. vulcanised into the tread band
2011/142 . . {Granular particles, e.g. hard granules}
2011/145 . . {Discontinuous fibres}
2011/147 . . {Foamed rubber or sponge rubber on the tread band}
11/16 . . of plug form, e.g. made from metal, textile
11/1606 . . . {retractable plug}
11/1612 . . . . {actuated by fluid, e.g. using fluid pressure difference}
11/1618 . . . . {actuated by temperature, e.g. by means of temperature sensitive elements}
11/1625 . . . {Arrangements thereof in the tread patterns, e.g. irregular}
11/1631 . . . {inclined with regard to the radial direction}
11/1637 . . . {Attachment of the plugs into the tread, e.g. screwed}
11/1643 . . . {with special shape of the plug-body portion, i.e. not cylindrical}
11/165 . . . . {conical}
11/1656 . . . . {concave or convex, e.g. barrel-shaped}
11/1662 . . . . {helical-shaped}
11/1668 . . . . {with an additional collar}
11/1675 . . . {with special shape of the plug- tip}
11/1681 . . . . {Spherical top portions}
11/1687 . . . . {Multiple tips}
11/1693 . . . {Attachment of the plug-tip within the plug-body}
11/18 . . of strip form, e.g. metallic combs, rubber strips of different wear resistance (B60C 11/20 takes precedence)
11/185 . . . {of metal comb form, lamellar shaped or blade-like}
11/20 . . in coiled form
11/22 . Tread rings between dual tyres
11/24 . Wear-indicating arrangements
11/243 . . {Tread wear sensors, e.g. electronic sensors}
11/246 . . {Tread wear monitoring systems (tyre pressure monitoring B60C 23/04)}

13/00 Tyre sidewalls; Protecting, decorating, marking, or the like, thereof (B60C 17/08 takes precedence; tyre shoulders B60C 11/01)

13/001 . {Decorating, marking or the like}
13/002 . {Protection against exterior elements}
13/003 . {characterised by sidewall curvature (carcass ply curvature B60C 9/0292)}
13/004 . . {of the internal side of the tyre}
2013/005 . {Physical properties of the sidewall rubber}
2013/006 . . {Modulus; Hardness; Loss modulus or "tangens delta"}
2013/007 . . {Thickness}
2013/008 . {built-up by narrow strip winding}
13/009 . {comprising additional bead cores in the sidewall}
13/02 . Arrangement of grooves or ribs
13/023 . . {preventing watersplash}
2013/026 . . {provided at the interior side only}
13/04 . having annular inlays or covers, e.g. white sidewalls
2013/045 . . {comprising different sidewall rubber layers}

15/00 Tyre beads, e.g. ply turn-up or overlap

15/0009 . {features of the carcass terminal portion}
15/0018 . . {not folded around the bead core, e.g. floating or down ply}
15/0027 . . {with low ply turn-up, i.e. folded around the bead core and terminating at the bead core}
15/0036 . . {with high ply turn-up, i.e. folded around the bead core and terminating radially above the point of maximum section width}
15/0045 . . . {with ply turn-up up to the belt edges, i.e. folded around the bead core and extending to the belt edges}
15/0054 . . {with ply turn-up portion parallel and adjacent to carcass main portion}
15/0063 . . {with ply turn-up portion diverging from carcass main portion}
15/0072 . . {with ply reverse folding, i.e. carcass layer folded around the bead core from the outside to the inside}
15/0081 . . {the carcass plies folded around or between more than one bead core}
2015/009 . . {Height of the carcass terminal portion defined in terms of a numerical value or ratio in proportion to section height}
15/02 . Seating or securing beads on rims (sealing means between beads and rims of tubeless tyres B60C 5/16; means for securing solid tyres on rims B60C 7/24; rims B60B 21/00)
15/0203 . . {using axially extending bead seating, i.e. the bead and the lower sidewall portion extend in the axial direction (B60C 15/0206 takes precedence)}
15/0206 . . {using inside rim bead seating, i.e. the bead being seated at a radially inner side of the rim}
15/0209 . . {Supplementary means for securing the bead}
15/0213 . . . {the bead being clamped by rings, cables, rim flanges or other parts of the rim}
15/0216 . . . {the bead being pierced by bolts, rivets, clips or other elements}
15/022 . . . {the bead being secured by turned-in rim flanges, e.g. rim of the clincher type}
15/0223 . . . {the bead being secured by clip-hook elements not forming part of the rim flange}
15/0226 . . . {the bead being secured by protrusions of the rim extending from the bead seat, e.g. hump or serrations}
15/023 . . . {the bead being secured by bead extensions which extend over and wrap around the rim flange}
15/0233 . . {Securing tyres without beads; Securing closed torus or tubular tyres}
15/0236 . . {Asymmetric bead seats, e.g. different bead diameter or inclination angle (asymmetric transverse section B60C 3/06; asymmetric bead reinforcement B60C 2015/0696)}
15/024 . . Bead contour, e.g. lips, grooves or ribs
15/0242 . . . {with bead extensions located radially outside the rim flange position, e.g. rim flange protectors}

2015/0245 . . . {Bead lips at the bead toe portion, i.e. the axially and radially inner end of the bead}
15/0247 . . . {with reverse bead seat inclination, i.e. the axially inner diameter of the bead seat is bigger than the axially outer diameter thereof}
15/028 . . Spacers between beads (emergency load supporting means B60C 17/00)
15/032 . . . inflatable
15/036 . . Tyres permanently fixed to the rim, e.g. by adhesive, by vulcanisation
15/04 . Bead cores (producing bead-rings or bead-cores for tyres B29D 30/48)
2015/042 . . {characterised by the material of the core, e.g. alloy}
2015/044 . . {characterised by a wrapping layer}
2015/046 . . {Cable cores, i.e. cores made-up of twisted wires}
2015/048 . . {Polygonal cores characterised by the winding sequence}
15/05 . . Multiple, i.e. with two or more cores in each bead
15/06 . Flipper strips, fillers, or chafing strips {and reinforcing layers for the construction of the bead}
15/0603 . . {characterised by features of the bead filler or apex (compositions of the apex rubber B60C 2001/0058)}
15/0607 . . . {comprising several parts, e.g. made of different rubbers}
2015/061 . . . {Dimensions of the bead filler in terms of numerical values or ratio in proportion to section height}
2015/0614 . . {characterised by features of the chafer or clinch portion, i.e. the part of the bead contacting the rim}
2015/0617 . . {comprising a cushion rubber other than the chafer or clinch rubber}
2015/0621 . . . {adjacent to the carcass turnup portion}
2015/0625 . . . {provided at the terminal edge portion of a carcass or reinforcing layer}
15/0628 . . {comprising a bead reinforcing layer}
15/0632 . . . {using flippers in contact with and wrapped around the bead core and, at least partially, in contact with the bead filler}
15/0635 . . . {using chippers between the carcass layer and chafer rubber wrapped around the bead}
2015/0639 . . . {between carcass main portion and bead filler not wrapped around the bead core}
2015/0642 . . . {between carcass turn-up and bead filler not wrapped around the bead core}
2015/0646 . . . {at the axially inner side of the carcass main portion not wrapped around the bead core}
2015/065 . . . {at the axially outer side of the carcass turn-up portion not wrapped around the bead core}
15/0653 . . . {with particular configuration of the cords in the respective bead reinforcing layer}
2015/0657 . . . . {comprising cords at an angle of maximal 10 degrees to the circumferential direction}
2015/066 . . . . {comprising cords at an angle of 10 to 30 degrees to the circumferential direction}
2015/0664 . . . . {comprising cords at an angle of 30 to 60 degrees to the circumferential direction}
2015/0667 . . . . {comprising cords at an angle of 60 to 90 degrees to the circumferential direction}
2015/0671 . . . . {the cord angle being different or variable within the same layer}
2015/0675 . . . . {characterised by the course of the cords, e.g. undulated or sinusoidal}
2015/0678 . . . {Physical properties of the bead reinforcing layer, e.g. modulus of the ply}
2015/0682 . . . {Physical properties or dimensions of the coating rubber}
2015/0685 . . . {Physical properties or dimensions of the cords, e.g. modulus of the cords}
2015/0689 . . . . {Cord density in width direction}
2015/0692 . . . {characterised by particular materials of the cords}
2015/0696 . . {Asymmetric bead reinforcement, e.g. arrangement of bead reinforcing layer or apex}

17/00 Tyres characterised by means enabling restricted operation in damaged or deflated condition; Accessories therefor (having multiple separate inflatable chambers B60C 5/20; {additional shear belt layers B60C 9/18})

17/0009 . {comprising sidewall rubber inserts, e.g. crescent shaped inserts}
17/0018 . . {two or more inserts in each sidewall portion}
17/0027 . . {comprising portions of different rubbers in a single insert}
17/0036 . . {comprising additional reinforcements}
17/0045 . . {comprising grooves or ribs, e.g. at the inner side of the insert}
2017/0054 . . {Physical properties or dimensions of the inserts}
2017/0063 . . . {Modulus; Hardness; Loss modulus or "tangens delta"}
2017/0072 . . . {Thickness}
2017/0081 . {comprising special reinforcing means in the crown area}
17/009 . {comprising annular protrusions projecting into the tyre cavity}
17/01 . utilising additional inflatable supports which become load supporting in emergency
17/02 . . inflated or expanded in emergency only
17/04 . utilising additional non-inflatable supports which become load-supporting in emergency
17/041 . . {characterised by coupling or locking means between rim and support}
17/042 . . . {preventing sliding or rotation between support and rim}
17/043 . . {made-up of an annular metallic shell}
17/044 . . {Expandable supports}
17/045 . . {Rotatable supports relative to the rim}
17/046 . . . {by means of ball bearings}
17/047 . . {comprising circumferential ribs}
17/048 . . {comprising transverse ribs}
17/06 . . resilient
17/061 . . . {comprising lateral openings}
2017/063 . . . {comprising circumferentially extending reinforcements}
17/065 . . . {made-up of foam inserts (tyres filled with foam B60C 5/002)}
17/066 . . . {made-up of plural spherical elements provided in the tyre chamber}
2017/068 . . . {comprising springs, e.g. helical springs}
17/08 . Means facilitating folding of sidewalls, e.g. run-flat sidewalls (for storage purposes B60C 3/08)
17/10 . Internal lubrication
17/103 . . {by means of surface coating, e.g. PTFE}

17/106 . . {Composition of the lubricant}

19/00 Tyre parts or constructions not otherwise provided for

19/001 . {Tyres requiring an asymmetric or a special mounting}

19/002 . {Noise damping elements provided in the tyre structure or attached thereto, e.g. in the tyre interior}

19/003 . {Balancing means attached to the tyre}

2019/004 . {Tyre sensors other than for detecting tyre pressure}

2019/005 . {Magnets integrated within the tyre structure}

2019/006 . {Warning devices, e.g. devices generating noise due to flat or worn tyres}

2019/007 . . {triggered by sensors}

2019/008 . {Venting means, e.g. for expelling entrapped air}

19/04 . Tyres with openings closeable by means other than the rim; Closing means therefor

19/08 . Electric charge dissipating arrangements

19/082 . . {comprising a conductive tread insert}

19/084 . . {using conductive carcasses}

19/086 . . {using conductive sidewalls}

19/088 . . {using conductive beads}

19/12 . Puncture preventing arrangements (B60C 9/00 takes precedence; inflatable inserts having reinforcing means B60C 5/08 {; sealing compositions per se B29C 73/163; devices for introducing sealing compositions into the tyre B29C 73/166})

19/122 . . {disposed inside of the inner liner}

19/125 . . {disposed removably on the tyre}

19/127 . . {for inner tubes}

23/00 Devices for measuring, signalling, controlling, or distributing tyre pressure or temperature, specially adapted for mounting on vehicles (measuring in general G01, e.g. G01L 17/00; remote signalling in general G08); **Arrangement of tyre inflating devices on vehicles, e.g. of pumps, of tanks {(supplying air for tyre inflation B60S 5/04)}; Tyre cooling arrangements**

23/001 . {Devices for manually or automatically controlling or distributing tyre pressure whilst the vehicle is moving}

23/002 . . {by monitoring conditions other than tyre pressure or deformation}

23/003 . . {the control being done on the vehicle, i.e. comprising a rotating joint between a vehicle mounted tank and the tyre}

23/004 . . {the control being done on the wheel, e.g. using a wheel-mounted reservoir}

23/005 . {Devices specially adapted for special wheel arrangements}

NOTE

B60C 23/001, B60C 23/02, B60C 23/04, B60C 23/06 or B60C 23/08

23/006 . . {having two wheels only}

23/007 . . {having multiple wheels arranged side by side}

23/008 . . {having wheels on more than two axles}

23/009 . . {having wheels on a trailer}

23/02 . Signalling devices actuated by tyre pressure {(hand-held tyre pressure gauges G01L 17/00)}

23/04 . . mounted on the wheel or tyre

23/0401 . . . {characterised by the type of alarm}

23/0403 . . . . {Mechanically generated audible signals, e.g. by buzzer or whistle signals}

23/0405 . . . . {Mechanically generated visible signals, e.g. by using a gauge needle}

23/0406 . . . . {Alarms noticeable from outside the vehicle, e.g. indication in side mirror, front light or audible alarms (B60C 23/0403, B60C 23/0405 take precedence)}

23/0408 . . . {transmitting the signals by non-mechanical means from the wheel or tyre to a vehicle body mounted receiver}

23/041 . . . . {Means for supplying power to the signal-transmitting means on the wheel}

23/0411 . . . . . {Piezo-electric generators}

23/0413 . . . . . {Wireless charging of active radio frequency circuits}

23/0415 . . . . {Automatically identifying wheel mounted units, e.g. after replacement or exchange of wheels}

23/0416 . . . . . {allocating a corresponding wheel position on vehicle, e.g. front/left or rear/right}

23/0418 . . . . {Sharing hardware components like housing, antenna, receiver or signal transmission line with other vehicle systems like keyless entry or brake control units}

23/042 . . . . . {cooperating with wheel hub mounted speed sensors}

23/0422 . . . . {characterised by the type of signal transmission means}

23/0423 . . . . . {Photo-electric, infra-red or visible light means}

23/0425 . . . . . {Means comprising permanent magnets, e.g. Hall-effect or Reed-switches}

23/0427 . . . . . {Near field transmission with inductive or capacitive coupling means}

23/0428 . . . . . {using passive wheel mounted resonance circuits}

23/043 . . . . . {using transformer type signal transducers, e.g. rotary transformers}

23/0432 . . . . . {using vehicle structural parts as signal path, e.g. chassis, axle or fender}

23/0433 . . . . . {Radio signals}

23/0435 . . . . . {Vehicle body mounted circuits, e.g. transceiver or antenna fixed to central console, door, roof, mirror or fender}

23/0437 . . . . . {Means for detecting electromagnetic field changes not being part of the signal transmission per se, e.g. strength, direction, propagation or masking}

23/0438 . . . . . {comprising signal transmission means, e.g. for a bidirectional communication with a corresponding wheel mounted receiver}

23/044 . . . . . {Near field triggers, e.g. magnets or triggers with 125 KHz}

23/0442 . . . . . {the transmitted signal comprises further information, e.g. instruction codes, sensor characteristics or identification data}

23/0444 . . . . . {Antenna structures, control or arrangements thereof, e.g. for directional antennas, diversity antenna, antenna multiplexing or antennas integrated in fenders}

23/0445 . . . . . {Means for changing operating mode, e.g. sleep mode, factory mode or energy saving mode}
23/0447 . . . . . {Wheel or tyre mounted circuits}
23/0449 . . . . . {Passive transducers, e.g. using surface acoustic waves, backscatter technology or pressure sensitive resonators (near field passive transducers B60C 23/0428)}
23/045 . . . . . {Means for detecting electromagnetic field changes being not part of the signal transmission per se, e.g. strength, direction, propagation or masking}
23/0452 . . . . . {Antenna structure, control or arrangement (vehicle tyre mounted antennas H01Q 1/2241)}
23/0454 . . . . . {Means for changing operation mode, e.g. sleep mode, factory mode or energy save mode}
23/0455 . . . . . {Transmission control of wireless signals}
23/0457 . . . . . {self triggered by timer}
23/0459 . . . . . {self triggered by motion sensor}
23/0461 . . . . . {externally triggered, e.g. by wireless request signal, magnet or manual switch}
23/0462 . . . . . {Structure of transmission protocol}
23/0464 . . . . . {to avoid signal interference}
23/0466 . . . . . {with signals sent by transmitters mounted on adjacent vehicles}
23/0467 . . . . {Electric contact means, e.g. slip-rings, rollers, brushes}
23/0469 . . . . {Transmission by sound, e.g. ultra-sound}
23/0471 . . . {System initialisation, e.g. upload or calibration of operating parameters}
23/0472 . . . . {to manually allocate ID codes or mounting positions, e.g. by service technicians}
23/0474 . . . {Measurement control, e.g. setting measurement rate or calibrating of sensors; Further processing of measured values, e.g. filtering, compensating or slope monitoring}
23/0476 . . . . {Temperature compensation of measured pressure values}
23/0477 . . . . {Evaluating waveform of pressure readings}
23/0479 . . . {Communicating with external units being not part of the vehicle, e.g. tools for diagnostic, mobile phones, electronic keys or service stations}
23/0481 . . . {System diagnostic, e.g. monitoring battery voltage, detecting hardware detachments or identifying wireless transmission failures}
23/0483 . . . {Wireless routers between wheel mounted transmitters and chassis mounted receivers}
23/0484 . . . {Detecting an ongoing tyre inflation}
23/0486 . . {comprising additional sensors in the wheel or tyre mounted monitoring device, e.g. movement sensors, microphones or earth magnetic field sensors}
23/0488 . . . {Movement sensor, e.g. for sensing angular speed, acceleration or centripetal force}
23/0489 . . . {for detecting the actual angular position of the monitoring device while the wheel is turning}
23/0491 . . {Constructional details of means for attaching the control device}
23/0493 . . . {for attachment on the tyre}
23/0494 . . . {Valve stem attachments positioned inside the tyre chamber}
23/0496 . . . {Valve stem attachments positioned outside of the tyre chamber}
23/0498 . . . {for rim attachments (B60C 23/0494, B60C 23/0496 take precedence)}
23/06 . Signalling devices actuated by deformation of the tyre, {e.g. tyre mounted deformation sensors or indirect determination of tyre deformation based on wheel speed, wheel-centre to ground distance or inclination of wheel axle}
23/061 . . {by monitoring wheel speed (measuring distance traversed on the ground by vehicles G01C 22/00)}
23/062 . . . {Frequency spectrum analysis of wheel speed signals, e.g. using Fourier transformation}
23/063 . . {Generating directly an audible signal by deformation of the tyre (by touching the ground B60C 23/085)}
23/064 . . {comprising tyre mounted deformation sensors, e.g. to determine road contact area}
23/065 . . {by monitoring vibrations in tyres or suspensions (B60C 23/062 takes precedence)}
23/066 . . {by monitoring wheel-centre to ground distance}
23/067 . . {by monitoring chassis to ground distance}
23/068 . . {by monitoring chassis to tyre distance}
23/08 . . by touching the ground
23/085 . . . {putting directly into action an audible signal}
23/10 . Arrangements of tyre-inflating pumps mounted on vehicles {(B60C 23/001 takes precedence)}
23/105 . . {the pump being mounted in the saddle-pillar of a bicycle}
23/12 . . operated by a running wheel
23/14 . . operated by the prime mover of the vehicle
23/16 . Arrangements of air tanks mounted on vehicles {(B60C 23/001 takes precedence)}
23/18 . Tyre cooling arrangements {, e.g. heat shields (wheels with cooling fins B60B 19/10)}
23/19 . . for dissipating heat
23/20 . Devices for measuring or signalling tyre temperature {only}

25/00 **Apparatus or tools adapted for mounting, removing, repairing or inspecting pneumatic or solid tyres** (apparatus or tools for mounting or dismounting wheels B60B 29/00; apparatus or tools characterised by the means for holding wheels or parts thereof B60B 30/00)

25/002 . {Inspecting tyres}

NOTE

When classifying in this group, classification is also made in the appropriate subgroups of B60C 25/0548

25/005 . . {inside surface}
25/007 . . {outside surface (measuring profile depth G01B 11/22)}

25/01 . for manually removing tyres from or mounting tyres on wheels
25/015 . . {for only breaking the beads}
25/02 . . Tyre levers or the like, i.e. hand-held (machine operated B60C 25/05)
25/025 . . . {with a jack}
25/04 . . . pivotal about the wheel axis, or movable along the rim edge, e.g. rollable
25/05 . . Machines, {i.e. motorized devices, e.g. for mounting, demounting (matching of tyres with rims, i.e. conjoint balancing G01M)}
25/0503 . . . {for mounting only}
25/0506 . . . {for demounting only}
25/0509 . . . {for inserting additional parts, e.g. support rings, sensors}
25/0512 . . . {Integrated systems performing multiple operations, e.g. assembly lines}
25/0515 . . . {Automated devices, e.g. mounting robots}
25/0518 . . . {Horizontal wheel axis in working position}
25/0521 . . . {Handling of rim or tyre, e.g. lifting and positioning devices}
25/0524 . . . {Separating tyres from rims, e.g. by destroying}
25/0527 . . . {Adapting to different wheel diameters, i.e. distance between support and tool}
25/053 . . . {Support of wheel parts during machine operation}
25/0533 . . . . {Fixing the tyre only, e.g. gripping the tread portion for inserting the rim}
25/0536 . . . . {axially fixing the rim, e.g. pulling devices}
25/0539 . . . . {radially fixing the rim, e.g. with gripping claws}
25/0542 . . . . {with self-centering means, e.g. cones}
25/0545 . . . . {with rotary motion of tool or tyre support, e.g. turntables}
25/0548 . . . {equipped with sensing means, e.g. for positioning, measuring or controlling}
25/0551 . . . . {mechanical}
25/0554 . . . . {optical, e.g. cameras}
25/0557 . . . . {thermal}
25/056 . . . . {measuring speed, acceleration or forces}
25/0563 . . . {Tools interacting with the tyre and moved in relation to the tyre during operation}
25/0566 . . . . {rolling only}
25/0569 . . . . {gliding only}
25/0572 . . . . {pressing only}
25/0575 . . . . {levering only}
25/0578 . . . . {hooking only}
25/0581 . . . . {Translational tool trajectory only}
25/0584 . . . . {Predetermined tool path, e.g. coulisse, multi-link}
25/0587 . . . . {Programmed tool path, e.g. robot arm with multiple degrees of freedom}
25/059 . . . . {Conjoint tool operations, i.e. at least two tools cooperating simultaneously}
25/0593 . . . . {Multi-functional tools for performing at least two operations, e.g. bead breaking and bead seeking}
25/0596 . . . {Soaping devices}
25/12 . . . for only seating the beads

WARNING

Not complete pending reclassification; see also groups B60C 25/05, B60C 25/145

25/122 . . . . acting on the tyre tread

WARNING

Not complete pending reclassification; see also groups B60C 25/05, B60C 25/145

25/125 . . . for only breaking the beads
25/128 . . . . acting axially on the whole circumference of the bead or sidewall
25/13 . . . . acting axially on a part of the bead or sidewall only at localised regions of the bead or side wall
25/132 . . . for removing and mounting tyres (for only seating the beads B60C 25/12; for only breaking the beads B60C 25/125; {for locating provisionally the beads of tubeless tyres against the sealing surfaces of the rims B60C 25/145})
25/135 . . . . having a tyre support or a tool, movable along wheel axis
25/138 . . . . . with rotary motion of tool or tyre support
25/14 . Apparatus or tools for spreading or locating tyre beads
25/142 . . {Devices for tightening or expanding the felly, devices for spreading the tyres}
25/145 . . {for locating provisionally the beads of tubeless tyres against the sealing surfaces of the rims, e.g. air filling bell}
25/147 . . {Safety cages for inflation}
25/15 . . with means for inverting the tyre
25/16 . {Tools for repairing damaged tyres}
25/18 . Tools for mounting or demounting air valves
25/185 . . {Automated devices, e.g. robots}
25/20 . Tools for attaching metallic tyres, e.g. iron tyres upon wooden rims

27/00 Non-skid devices temporarily attachable to resilient tyres or resiliently-tyred wheels {(vehicle mounted non-skid chains B60B 39/00)}

27/003 . {Mounting aids, e.g. auxiliary tensioning tools, slotted ramps}
27/006 . {provided with protective parts, e.g. rubber elements to protect the rim portion}
27/02 . extending over restricted arcuate parts of the circumference of the tread (B60C 27/20 takes precedence)
27/0207 . . {involving lugs or rings taking up wear, e.g. chain links, chain connectors (chain couplings for, e.g. hoisting F16G 15/00)}
27/0215 . . . {Profiled links, e.g. cross-section other than round}
27/0223 . . . {Studded links, i.e. traction enhancing parts located on the link or inserted into the link}
27/023 . . {provided with radial arms for supporting the ground engaging parts on the wheel}
27/0238 . . {provided with tensioning means}
27/0246 . . . {Resilient pretension}
27/0253 . . . {Centrifugal forces for tensioning while driving}
27/0261 . . {provided with fastening means}

27/0269 . . . {acting on the wheel, e.g. on the rim or wheel bolts}
27/0276 . . . . {through apertures in the rim, e.g. fastening from one lateral side to the other lateral side of the rim; extending axially through the rim}
27/0284 . . . {acting on the tread portion, e.g. special fixing agents, fastened in the groove of the tyre}
27/0292 . . . {acting on the sidewall of the tyre}
27/04 . . the ground-engaging part being rigid
27/045 . . . {involving retractable devices (fixing of spade lugs B60B 15/00)}
27/06 . extending over the complete circumference of the tread, e.g. made of chains {or cables} (B60C 27/20 takes precedence)
27/061 . . {provided with radial arms for supporting the ground engaging parts on the tread}
27/062 . . {provided with fastening means}
27/063 . . . {acting on the wheel, e.g. on the rim or wheel bolts}
27/064 . . . {through apertures in the rim, e.g. fastening from one lateral side to the other lateral side of the rim; extending axially through the rim}
27/065 . . . {acting on the tread portion, e.g. special fixing agents, fastened in the groove of the tyre}
27/066 . . . {acting on the sidewall of the tyre}
27/067 . . {Special chain layout;, i.e. distribution of chain portions over the tread, e.g. arranged in polygon pattern}
27/068 . . {the ground-engaging part being rigid}
27/08 . . involving lugs or rings taking up wear, {, e.g. chain links, chain connectors (chain couplings for, e.g. hoisting F16G 15/00)}
27/083 . . . {Profiled links, i.e. cross-section other than round, e.g. hexagonal}
27/086 . . . {Studded links, i.e. traction enhancing parts located on the link or inserted into the link}
27/10 . . {provided with} tensioning means
27/12 . . . resilient {pretension}
27/125 . . . . {Centrifugal forces for tensioning while driving}
27/14 . . automatically attachable
27/145 . . . {the anti-skid device being wound around the wheel by its rotation from a point connected to the body frame of the vehicle}
27/16 . . formed of close material, e.g. leather {or synthetic mats}
27/18 . . . the material being fabric, e.g. woven wire {or textile}
27/20 . comprising ground-engaging plate-like elements
27/22 . for tandem tyres (endless-track features B62D)

29/00 Arrangements of tyre-inflating valves to tyres or rims; Accessories for tyre-inflating valves, not otherwise provided for (tools for mounting or demounting valves B60C 25/18; valves per se, valve dust caps F16K)

29/002 . {characterised by particular features of the valve core}
29/005 . {characterised by particular features of the valve stem}
29/007 . {for tyres with segmental sections or for multi-chamber tyres}
29/02 . Connection to rims
29/04 . Connection to tyres {or inner tubes}
29/06 . Accessories for tyre-inflating valves, e.g. housings, guards, covers for valve caps, locks, not otherwise provided for {(B60C 23/0496 takes precedence; tools for screwing and unscrewing valve caps B25B 27/0057; pump connectors F04B 33/005)}
29/062 . . {for filling a tyre with particular materials, e.g. liquids (B60C 5/004, B60C 5/005 take precedence)}
29/064 . . {Hose connections for pneumatic tyres, e.g. to spare wheels}
29/066 . . {Valve caps}
29/068 . . {Pressure relief devices, i.e. safety devices for overpressure}

99/00 Subject matter not provided for in other groups of this subclass

99/003 . {Tyre heating arrangements}
99/006 . {Computer aided tyre design or simulation}

2200/00 Tyres specially adapted for particular applications

2200/02 . for aircrafts
2200/04 . for road vehicles, e.g. passenger cars
2200/06 . for heavy duty vehicles
2200/065 . . for construction vehicles
2200/08 . for agricultural vehicles
2200/10 . for motorcycles, scooters or the like
2200/12 . for bicycles
2200/14 . for off-road use