

CPC COOPERATIVE PATENT CLASSIFICATION

B PERFORMING OPERATIONS; TRANSPORTING

(NOTES omitted)

TRANSPORTING

B60 VEHICLES IN GENERAL

(NOTE omitted)

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 ([B60C 21/04](#), [B60C 21/08](#) take precedence)

5/142	. . . {provided partially, i.e. not covering the whole inner wall}	9/0028	. {Reinforcements comprising mineral fibres, e.g. glass or carbon fibres}
2005/145	. . . {made of laminated layers}	2009/0035	. {Reinforcements made of organic materials, e.g. rayon, cotton or silk}
2005/147	. . . {characterised by the joint or splice}	9/0042	. {Reinforcements made of synthetic materials}
5/16	. . Sealing means between beads and rims, e.g. bands	9/005	. {Reinforcements made of different materials, e.g. hybrid or composite cords}
5/18	. Sectional casings, e.g. comprising replaceable arcuate parts	9/0057	. {Reinforcements comprising preshaped elements, e.g. undulated or zig-zag filaments}
5/20	. having multiple separate inflatable chambers (with additional tubes which become load supporting in emergency B60C 17/02)	9/0064	. {Reinforcements comprising monofilaments}
5/22	. . the chambers being annular	2009/0071	. {characterised by special physical properties of the reinforcements}
5/24	. . the walls of the chambers extending transversely of the tyre	2009/0078	. . {Modulus}
7/00	Non-inflatable or solid tyres (B60C 1/00 takes precedence; tyres or rims characterised by rail engaging elements B60B 17/00)	2009/0085	. . {Tensile strength}
2007/005	. {made by casting, e.g. of polyurethane}	2009/0092	. . {Twist structure}
7/02	. made from ropes or bristles	9/02	. Carcasses
7/04	. made of wood or leather	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}
7/06	. made of metal	2009/0215	. . {Partial carcass reinforcing plies, i.e. the plies neither crossing the equatorial plane nor folded around the bead core}
7/08	. built-up from a plurality of arcuate parts	2009/0223	. . {comprising a cushion layer between adjacent carcass plies}
7/10	. characterised by means for increasing resiliency (highly resilient wheels B60B 9/00)	9/023	. . {built up from narrow strips, individual cords or filaments, e.g. using filament winding}
7/102	. . {Tyres built-up with separate rubber parts}	9/0238	. . {characterised by special physical properties of the carcass ply}
7/105	. . {using foam material}	2009/0246	. . . {Modulus of the ply}
2007/107	. . {comprising lateral openings}	2009/0253	. . . . {being different between adjacent plies}
7/12	. . using enclosed chambers, e.g. gas-filled (inflatable tyres B60C 5/00)	2009/0261	. . . . {being different within the same ply}
7/125	. . . {enclosed chambers defined between rim and tread}	2009/0269	. . {Physical properties or dimensions of the carcass coating rubber}
7/14	. . using springs	2009/0276	. . . {Modulus; Hardness; Loss modulus or "tangens delta"}
7/143	. . . {having a lateral extension disposed in a plane parallel to the wheel axis}	2009/0284	. . . {Thickness}
2007/146	. . . {extending substantially radially, e.g. like spokes}	9/0292	. . {Carcass ply curvature (sidewall curvature B60C 13/003)}
7/16	. . . of helical or flat coil form	9/04	. . the reinforcing cords of each carcass ply arranged in a substantially parallel relationship
7/18	. . . . disposed radially relative to wheel axis	2009/0408	. . . {Carcass joints or splices}
7/20	. . . . disposed circumferentially relative to wheel axis	2009/0416	. . . {Physical properties or dimensions of the carcass cords}
7/22	. having inlays other than for increasing resiliency, e.g. for armouring	2009/0425	. . . . {Diameters of the cords; Linear density thereof}
7/24	. characterised by means for securing tyres on rim or wheel body	2009/0433	. . . . {Modulus}
7/26	. . using bolts	2009/0441	. . . . {Density in width direction}
7/28	. . using straps or the like, e.g. vulcanised into the tyre	2009/045	. . . . {Tensile strength}
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}	2009/0458	. . . . {Elongation of the reinforcements at break point}
	NOTE	2009/0466	. . . . {Twist structures}
	When classifying in this group, classification is also made in subclass B32B insofar as any layered product is concerned	2009/0475	. . . {Particular materials of the carcass cords}
9/0007	. {Reinforcements made of metallic elements, e.g. cords, yarns, filaments or fibres made from metal}	2009/0483	. . . {Different cords in the same layer}
2009/0014	. . {Surface treatments of steel cords}	2009/0491	. . . {with special path of the carcass cords, e.g. sinusoidal}
2009/0021	. . {Coating rubbers for steel cords}	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)	2009/2041	. . . {with an interrupted belt ply, e.g. using two or more portions of the same ply}
9/09	. . . . combined with other carcass plies having cords extending diagonally from bead to bead, i.e. combined radial ply and bias angle ply	2009/2045	. . . {with belt joints or splices}
9/10	. . the reinforcing cords within each carcass ply arranged in a crossing relationship	2009/2048	. . . {characterised by special physical properties of the belt plies}
9/11	. . . Woven, braided, or knitted plies	2009/2051	. . . . {Modulus of the ply}
9/12	. . built-up with rubberised layers of discrete fibres or filaments	2009/2054	. . . . . {being different within the same ply}
9/13	. . . with two or more differing cord materials	2009/2058	. . . . . {being different between adjacent plies}
9/14	. . built-up with sheets, webs, or films of homogeneous material, e.g. synthetics, sheet metal, rubber	2009/2061	. . . {Physical properties or dimensions of the belt coating rubber}
2009/145	. . . {at the inner side of the carcass structure}	2009/2064	. . . . {Modulus; Hardness; Loss modulus or "tangens delta"}
9/16	. . built-up with metallic reinforcing inlays	2009/2067	. . . . {Thickness}
9/17	. . asymmetric to the midcircumferential plane of the tyre	2009/207	. . . . {Double layers, e.g. using different rubbers in the same belt ply}
9/18	. Structure or arrangement of belts or breakers, crown-reinforcing or cushioning layers	2009/2074	. . . {Physical properties or dimension of the belt cord}
9/1807	. . {comprising fabric reinforcements}	2009/2077	. . . . {Diameters of the cords; Linear density thereof}
2009/1814	. . . {square woven}	2009/208	. . . . {Modulus of the cords}
9/1821	. . {comprising discrete fibres or filaments}	2009/2083	. . . . {Density in width direction}
2009/1828	. . {characterised by special physical properties of the belt ply}	2009/2087	. . . . . {with variable density in the same layer}
9/1835	. . {Rubber strips or cushions at the belt edges (compositions B60C 2001/0075)}	2009/209	. . . . {Tensile strength}
2009/1842	. . . {Width or thickness of the strips or cushions}	2009/2093	. . . . {Elongation of the reinforcements at break point}
9/185	. . . {between adjacent or radially below the belt plies}	2009/2096	. . . . {Twist structures}
2009/1857	. . . {radially above the belt plies}	9/22	. . . the plies being arranged with all cords disposed along the circumference of the tyre
2009/1864	. . . {wrapped around the edges of the belt}	9/2204	. . . . {obtained by circumferentially narrow strip winding}
2009/1871	. . {with flat cushions or shear layers between belt layers}	2009/2209	. . . . . {characterised by tension of the cord during winding}
2009/1878	. . {with flat cushions or shear layers between the carcass and the belt}	2009/2214	. . . . {characterised by the materials of the zero degree ply cords}
2009/1885	. . {with belt ply between adjacent carcass plies}	2009/2219	. . . . {with a partial zero degree ply at the belt edges - edge band}
2009/1892	. . {with belt ply radial inside the carcass structure}	2009/2223	. . . . {with an interrupted zero degree ply, e.g. using two or more portions for the same ply}
9/20	. . built-up from rubberised plies each having all cords arranged substantially parallel	2009/2228	. . . . {characterised by special physical properties of the zero degree plies}
9/2003	. . . {characterised by the materials of the belt cords}	2009/2233	. . . . . {Modulus of the zero degree ply}
9/2006	. . . . {consisting of steel cord plies only}	2009/2238	. . . . {Physical properties or dimensions of the ply coating rubber}
9/2009	. . . . {comprising plies of different materials}	2009/2242	. . . . . {Modulus; Hardness; Loss modulus or "tangens delta"}
2009/2012	. . . {with particular configuration of the belt cords in the respective belt layers}	2009/2247	. . . . . {Thickness}
2009/2016	. . . . {comprising cords at an angle of 10 to 30 degrees to the circumferential direction}	2009/2252	. . . . {Physical properties or dimension of the zero degree ply cords}
2009/2019	. . . . {comprising cords at an angle of 30 to 60 degrees to the circumferential direction}	2009/2257	. . . . . {Diameters of the cords; Linear density thereof}
2009/2022	. . . . {comprising cords at an angle of 60 to 90 degrees to the circumferential direction}	2009/2261	. . . . . {Modulus of the cords}
2009/2025	. . . . {with angle different or variable in the same layer}	2009/2266	. . . . . {Density of the cords in width direction}
2009/2029	. . . . {with different cords in the same layer, i.e. cords with different materials or dimensions}	2009/2271	. . . . . {with variable density}
2009/2032	. . . . {characterised by the course of the belt cords, e.g. undulated or sinusoidal}	2009/2276	. . . . . {Tensile strength}
2009/2035	. . . {built-up by narrow strips}	2009/228	. . . . . {Elongation of the reinforcements at break point}
2009/2038	. . . {using lateral belt strips at belt edges, e.g. edge bands}	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}	2011/0346	. . . . . {with zigzag shape}
2009/266	. . . . {combined with non folded cut-belt plies}	2011/0348	. . . . . {Narrow grooves, i.e. having a width of less than 4 mm}
9/28	. . characterised by the belt or breaker dimensions or curvature relative to carcass (B60C 9/30 takes precedence)	2011/0351	. . . . . {Shallow grooves, i.e. having a depth of less than 50% of other grooves}
2009/283	. . . {characterised by belt curvature}	2011/0353	. . . . . {characterised by width}
2009/286	. . . . {being substantially flat}	2011/0355	. . . . . {characterised by depth}
9/30	. . asymmetric to the midcircumferential plane of the tyre	2011/0358	. . . . . {Lateral grooves, i.e. having an angle of 45 to 90 degrees to the equatorial plane}
11/00	Tyre tread bands; Tread patterns; Anti-skid inserts	2011/036	. . . . . {Narrow grooves, i.e. having a width of less than 3 mm}
11/0008	. {characterised by the tread rubber}	2011/0362	. . . . . {Shallow grooves, i.e. having a depth of less than 50% of other grooves}
2011/0016	. . {Physical properties or dimensions}	2011/0365	. . . . . {characterised by width}
2011/0025	. . . {Modulus or tan delta}	2011/0367	. . . . . {characterised by depth}
2011/0033	. . . {Thickness of the tread}	2011/0369	. . . . . {with varying depth of the groove}
11/0041	. {comprising different tread rubber layers}	2011/0372	. . . . . {with particular inclination angles}
11/005	. . {with cap and base layers}	2011/0374	. . . . . {Slant grooves, i.e. having an angle of about 5 to 35 degrees to the equatorial plane}
11/0058	. . . {with different cap rubber layers in the axial direction}	2011/0376	. . . . . {characterised by width}
11/0066	. . . . {having an asymmetric arrangement}	2011/0379	. . . . . {characterised by depth}
11/0075	. . . {with different base rubber layers in the axial direction}	2011/0381	. . . . . {Blind or isolated grooves}
11/0083	. {characterised by the curvature of the tyre tread}	2011/0383	. . . . . {at the centre of the tread}
2011/0091	. {built-up by narrow strip winding}	2011/0386	. . . {Continuous ribs}
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)	2011/0388	. . . . {provided at the equatorial plane}
2011/013	. . {provided with a recessed portion}	2011/039	. . . . {provided at the shoulder portion}
2011/016	. . {different rubber for tread wings}	2011/0393	. . . . {Narrow ribs, i.e. having a rib width of less than 8 mm}
11/02	. Replaceable treads	2011/0395	. . . . . {for linking shoulder blocks}
11/03	. Tread patterns	2011/0397	. . . . . {Sacrificial ribs, i.e. ribs recessed from outer tread contour}
11/0302	. . {directional pattern, i.e. with main rolling direction}	11/04	. . in which the raised area of the pattern consists only of continuous circumferential ribs, e.g. zigzag (B60C 11/12, B60C 11/13 take precedence)
11/0304	. . {Asymmetric patterns}	11/042	. . . {further characterised by the groove cross-section}
11/0306	. . {Patterns comprising block rows or discontinuous ribs}	11/045	. . . . {the groove walls having a three-dimensional shape}
11/0309	. . . {further characterised by the groove cross-section}	11/047	. . . . {the groove bottom comprising stone trapping protection elements, e.g. ribs}
11/0311	. . {Patterns comprising tread lugs arranged parallel or oblique to the axis of rotation}	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)
2011/0313	. . . {directional type}	11/12	. . characterised by the use of narrow slits or incisions, e.g. sipes
11/0316	. . . {further characterised by the groove cross-section}	11/1204	. . . {with special shape of the sipe}
11/0318	. . {irregular patterns with particular pitch sequence}	2011/1209	. . . . {straight at the tread surface}
11/032	. . {Patterns comprising isolated recesses}	2011/1213	. . . . {sinusoidal or zigzag at the tread surface}
11/0323	. . . {tread comprising channels under the tread surface, e.g. for draining water}	11/1218	. . . . {Three-dimensional shape with regard to depth and extending direction}
2011/0325	. . {Irregular patterns with particular pitch sequence}	11/1222	. . . . {Twisted or warped shape in the sipe plane}
11/0327	. . {characterised by special properties of the tread pattern}	2011/1227	. . . . {having different shape within the pattern}
11/033	. . . {by the void or net-to-gross ratios of the patterns}	2011/1231	. . . . {being shallow, i.e. sipe depth of less than 3 mm}
11/0332	. . . {by the footprint-ground contacting area of the tyre tread}	11/1236	. . . {with special arrangements in the tread pattern}
2011/0334	. . . {Stiffness}	11/124	. . . . {inclined with regard to a plane normal to the tread surface}
2011/0337	. . {characterised by particular design features of the pattern}	2011/1245	. . . . {being arranged in crossing relation, e.g. sipe mesh}
2011/0339	. . . {Grooves}	11/125	. . . . {arranged at the groove bottom}
2011/0341	. . . . {Circumferential grooves}	2011/1254	. . . . {with closed sipe, i.e. not extending to a groove}
2011/0344	. . . . . {provided at the equatorial plane}	11/1259	. . . {Depth of the sipe}

11/1263	. . . . {different within the same sipe}	11/22	. Tread rings between dual tyres
2011/1268	. . . . {being different from sipe to sipe}	11/24	. Wear-indicating arrangements
11/1272	. . . {Width of the sipe}	11/243	. . {Tread wear sensors, e.g. electronic sensors}
2011/1277	. . . . {being narrow, i.e. less than 0.3 mm}	11/246	. . {Tread wear monitoring systems (tyre pressure monitoring B60C 23/04)}
11/1281	. . . . {different within the same sipe, i.e. enlarged width portion at sipe bottom or along its length}	13/00	Tyre sidewalls; Protecting, decorating, marking, or the like, thereof (B60C 17/08 takes precedence; tyre shoulders B60C 11/01)
2011/1286	. . . . {being different from sipe to sipe}	13/001	. {Decorating, marking or the like}
2011/129	. . . {Sipe density, i.e. the distance between the sipes within the pattern}	13/002	. {Protection against exterior elements}
2011/1295	. . . . {variable}	13/003	. {characterised by sidewall curvature (carcass ply curvature B60C 9/0292)}
11/13	. . characterised by the groove cross-section, e.g. for buttressing or preventing stone-trapping	13/004	. . {of the internal side of the tyre}
11/1307	. . . {with special features of the groove walls}	2013/005	. {Physical properties of the sidewall rubber}
11/1315	. . . . {having variable inclination angles, e.g. warped groove walls}	2013/006	. . {Modulus; Hardness; Loss modulus or "tangens delta"}
11/1323	. . . . {asymmetric}	2013/007	. . {Thickness}
2011/133	. . . . {comprising recesses}	2013/008	. {built-up by narrow strip winding}
2011/1338	. . . . {comprising protrusions}	13/009	. {comprising additional bead cores in the sidewall}
11/1346	. . . . {covered by a rubber different from the tread rubber}	13/02	. Arrangement of grooves or ribs
11/1353	. . . {with special features of the groove bottom}	13/023	. . {preventing watersplash}
2011/1361	. . . . {with protrusions extending from the groove bottom}	2013/026	. . {provided at the interior side only}
11/1369	. . . {Tie bars for linking block elements and bridging the groove}	13/04	. having annular inlays or covers, e.g. white sidewalls
11/1376	. . . {Three dimensional block surfaces departing from the enveloping tread contour}	2013/045	. . {comprising different sidewall rubber layers}
11/1384	. . . . {with chamfered block corners}	15/00	Tyre beads, e.g. ply turn-up or overlap
11/1392	. . . . {with chamfered block edges}	15/0009	. {features of the carcass terminal portion}
11/14	. Anti-skid inserts, e.g. vulcanised into the tread band	15/0018	. . {not folded around the bead core, e.g. floating or down ply}
2011/142	. . {Granular particles, e.g. hard granules}	15/0027	. . {with low ply turn-up, i.e. folded around the bead core and terminating at the bead core}
2011/145	. . {Discontinuous fibres}	15/0036	. . {with high ply turn-up, i.e. folded around the bead core and terminating radially above the point of maximum section width}
2011/147	. . {Foamed rubber or sponge rubber on the tread band}	15/0045	. . . {with ply turn-up up to the belt edges, i.e. folded around the bead core and extending to the belt edges}
11/16	. . of plug form, e.g. made from metal, textile	15/0054	. . {with ply turn-up portion parallel and adjacent to carcass main portion}
11/1606	. . . {retractable plug}	15/0063	. . {with ply turn-up portion diverging from carcass main portion}
11/1612	. . . . {actuated by fluid, e.g. using fluid pressure difference}	15/0072	. . {with ply reverse folding, i.e. carcass layer folded around the bead core from the outside to the inside}
11/1618	. . . . {actuated by temperature, e.g. by means of temperature sensitive elements}	15/0081	. . {the carcass plies folded around or between more than one bead core}
11/1625	. . . {Arrangements thereof in the tread patterns, e.g. irregular}	2015/009	. . {Height of the carcass terminal portion defined in terms of a numerical value or ratio in proportion to section height}
11/1631	. . . {inclined with regard to the radial direction}	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)
11/1637	. . . {Attachment of the plugs into the tread, e.g. screwed}	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)}
11/1643	. . . {with special shape of the plug-body portion, i.e. not cylindrical}	15/0206	. . {using inside rim bead seating, i.e. the bead being seated at a radially inner side of the rim}
11/165	. . . . {conical}	15/0209	. . {Supplementary means for securing the bead}
11/1656	. . . . {concave or convex, e.g. barrel-shaped}	15/0213	. . . {the bead being clamped by rings, cables, rim flanges or other parts of the rim}
11/1662	. . . . {helical-shaped}	15/0216	. . . {the bead being pierced by bolts, rivets, clips or other elements}
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		

15/022	. . . {the bead being secured by turned-in rim flanges, e.g. rim of the clincher type}	2015/0639	. . . {between carcass main portion and bead filler not wrapped around the bead core}
15/0223	. . . {the bead being secured by clip-hook elements not forming part of the rim flange}	2015/0642	. . . {between carcass turn-up and bead filler not wrapped around the bead core}
15/0226	. . . {the bead being secured by protrusions of the rim extending from the bead seat, e.g. hump or serrations}	2015/0646	. . . {at the axially inner side of the carcass main portion not wrapped around the bead core}
15/023	. . . {the bead being secured by bead extensions which extend over and wrap around the rim flange}	2015/065	. . . {at the axially outer side of the carcass turn-up portion not wrapped around the bead core}
15/0233	. . {Securing tyres without beads; Securing closed torus or tubular tyres}	15/0653	. . . {with particular configuration of the cords in the respective bead reinforcing layer}
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)}	2015/0657	. . . . {comprising cords at an angle of maximal 10 degrees to the circumferential direction}
15/024	. . Bead contour, e.g. lips, grooves or ribs	2015/066	. . . . {comprising cords at an angle of 10 to 30 degrees to the circumferential direction}
15/0242	. . . {with bead extensions located radially outside the rim flange position, e.g. rim flange protectors}	2015/0664	. . . . {comprising cords at an angle of 30 to 60 degrees to the circumferential direction}
2015/0245	. . . {Bead lips at the bead toe portion, i.e. the axially and radially inner end of the bead}	2015/0667	. . . . {comprising cords at an angle of 60 to 90 degrees to the circumferential direction}
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}	2015/0671	. . . . {the cord angle being different or variable within the same layer}
15/028	. . Spacers between beads (emergency load supporting means B60C 17/00)	2015/0675	. . . . {characterised by the course of the cords, e.g. undulated or sinusoidal}
15/032	. . . inflatable	2015/0678	. . . {Physical properties of the bead reinforcing layer, e.g. modulus of the ply}
15/036	. . Tyres permanently fixed to the rim, e.g. by adhesive, by vulcanisation	2015/0682	. . . {Physical properties or dimensions of the coating rubber}
15/04	. Bead cores (producing bead-rings or bead-cores for tyres B29D 30/48)	2015/0685	. . . {Physical properties or dimensions of the cords, e.g. modulus of the cords}
2015/042	. . {characterised by the material of the core, e.g. alloy}	2015/0689	. . . . {Cord density in width direction}
2015/044	. . {characterised by a wrapping layer}	2015/0692	. . . {characterised by particular materials of the cords}
2015/046	. . {Cable cores, i.e. cores made-up of twisted wires}	2015/0696	. . {Asymmetric bead reinforcement, e.g. arrangement of bead reinforcing layer or apex}
2015/048	. . {Polygonal cores characterised by the winding sequence}		
15/05	. . multiple, i.e. with two or more cores in each bead	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)
15/06	. Flipper strips, fillers, or chafing strips {and reinforcing layers for the construction of the bead}	17/0009	. {comprising sidewall rubber inserts, e.g. crescent shaped inserts}
15/0603	. . {characterised by features of the bead filler or apex (compositions of the apex rubber B60C 2001/0058)}	17/0018	. . {two or more inserts in each sidewall portion}
15/0607	. . . {comprising several parts, e.g. made of different rubbers}	17/0027	. . {comprising portions of different rubbers in a single insert}
2015/061	. . . {Dimensions of the bead filler in terms of numerical values or ratio in proportion to section height}	17/0036	. . {comprising additional reinforcements}
2015/0614	. . {characterised by features of the chafer or clinch portion, i.e. the part of the bead contacting the rim}	17/0045	. . {comprising grooves or ribs, e.g. at the inner side of the insert}
2015/0617	. . {comprising a cushion rubber other than the chafer or clinch rubber}	2017/0054	. . {Physical properties or dimensions of the inserts}
2015/0621	. . . {adjacent to the carcass turnup portion}	2017/0063	. . . {Modulus; Hardness; Loss modulus or "tangens delta"}
2015/0625	. . . {provided at the terminal edge portion of a carcass or reinforcing layer}	2017/0072	. . . {Thickness}
15/0628	. . {comprising a bead reinforcing layer}	2017/0081	. {comprising special reinforcing means in the crown area}
15/0632	. . . {using flippers in contact with and wrapped around the bead core and, at least partially, in contact with the bead filler}	17/009	. {comprising annular protrusions projecting into the tyre cavity}
15/0635	. . . {using chippers between the carcass layer and chafer rubber wrapped around the bead}	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}	23/003	. . {the control being done on the vehicle, i.e. comprising a rotating joint between a vehicle mounted tank and the tyre}
17/044	. . {Expandable supports}		
17/045	. . {Rotatable supports relative to the rim}	23/004	. . {the control being done on the wheel, e.g. using a wheel-mounted reservoir}
17/046	. . . {by means of ball bearings}	23/005	. {Devices specially adapted for special wheel arrangements}
17/047	. . {comprising circumferential ribs}		
17/048	. . {comprising transverse ribs}		
17/06	. . resilient		
17/061	. . . {comprising lateral openings}		
2017/063	. . . {comprising circumferentially extending reinforcements}		NOTE B60C 23/001 , B60C 23/02 , B60C 23/04 , B60C 23/06 or B60C 23/08
17/065	. . . {made-up of foam inserts (tyres filled with foam B60C 5/002)}	23/006	. . {having two wheels only}
17/066	. . . {made-up of plural spherical elements provided in the tyre chamber}	23/007	. . {having multiple wheels arranged side by side}
2017/068	. . . {comprising springs, e.g. helical springs}	23/008	. . {having wheels on more than two axles}
17/08	. Means facilitating folding of sidewalls, e.g. run-flat sidewalls (for storage purposes B60C 3/08)	23/009	. . {having wheels on a trailer}
17/10	. Internal lubrication	23/02	. Signalling devices actuated by tyre pressure {(hand-held tyre pressure gauges G01L 17/00)}
17/103	. . {by means of surface coating, e.g. PTFE}	23/04	. . mounted on the wheel or tyre
17/106	. . {Composition of the lubricant}	23/0401	. . . {characterised by the type of alarm}
		23/0403	. . . . {Mechanically generated audible signals, e.g. by buzzer or whistle signals}
19/00	Tyre parts or constructions not otherwise provided for	23/0405	. . . . {Mechanically generated visible signals, e.g. by using a gauge needle}
19/001	. {Tyres requiring an asymmetric or a special mounting}	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)}
19/002	. {Noise damping elements provided in the tyre structure or attached thereto, e.g. in the tyre interior}	23/0408	. . . {transmitting the signals by non-mechanical means from the wheel or tyre to a vehicle body mounted receiver}
19/003	. {Balancing means attached to the tyre}	23/041	. . . . {Means for supplying power to the signal-transmitting means on the wheel}
2019/004	. {Tyre sensors other than for detecting tyre pressure}	23/0411	. . . . . {Piezo-electric generators}
2019/005	. {Magnets integrated within the tyre structure}	23/0413	. . . . . {Wireless charging of active radio frequency circuits}
2019/006	. {Warning devices, e.g. devices generating noise due to flat or worn tyres}	23/0415	. . . . . {Automatically identifying wheel mounted units, e.g. after replacement or exchange of wheels}
2019/007	. . {triggered by sensors}	23/0416	. . . . . {allocating a corresponding wheel position on vehicle, e.g. front/left or rear/right}
2019/008	. {Venting means, e.g. for expelling entrapped air}	23/0418	. . . . . {Sharing hardware components like housing, antenna, receiver or signal transmission line with other vehicle systems like keyless entry or brake control units}
19/04	. Tyres with openings closeable by means other than the rim; Closing means therefor	23/042	. . . . . {cooperating with wheel hub mounted speed sensors}
19/08	. Electric charge dissipating arrangements	23/0422	. . . . . {characterised by the type of signal transmission means}
19/082	. . {comprising a conductive tread insert}	23/0423	. . . . . {Photo-electric, infra-red or visible light means}
19/084	. . {using conductive carcasses}	23/0425	. . . . . {Means comprising permanent magnets, e.g. Hall-effect or Reed-switches}
19/086	. . {using conductive sidewalls}	23/0427	. . . . . {Near field transmission with inductive or capacitive coupling means}
19/088	. . {using conductive beads}	23/0428	. . . . . {using passive wheel mounted resonance circuits}
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)	23/043	. . . . . {using transformer type signal transducers, e.g. rotary transformers}
19/122	. . {disposed inside of the inner liner}	23/0432	. . . . . {using vehicle structural parts as signal path, e.g. chassis, axle or fender}
19/125	. . {disposed removably on the tyre}	23/0433	. . . . . {Radio signals}
19/127	. . {for inner tubes}	23/0435	. . . . . {Vehicle body mounted circuits, e.g. transceiver or antenna fixed to central console, door, roof, mirror or fender}
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}		

23/0437	. . . . .	{Means for detecting electromagnetic field changes not being part of the signal transmission <i>per se</i> , e.g. strength, direction, propagation or masking}	23/0476	. . . . .	{Temperature compensation of measured pressure values}
23/0438	. . . . .	{comprising signal transmission means, e.g. for a bidirectional communication with a corresponding wheel mounted receiver}	23/0477	. . . . .	{Evaluating waveform of pressure readings}
23/044	. . . . .	{Near field triggers, e.g. magnets or triggers with 125 KHz}	23/0479	. . . . .	{Communicating with external units being not part of the vehicle, e.g. tools for diagnostic, mobile phones, electronic keys or service stations}
23/0442	. . . . .	{the transmitted signal comprises further information, e.g. instruction codes, sensor characteristics or identification data}	23/0481	. . . . .	{System diagnostic, e.g. monitoring battery voltage, detecting hardware detachments or identifying wireless transmission failures}
23/0444	. . . . .	{Antenna structures, control or arrangements thereof, e.g. for directional antennas, diversity antenna, antenna multiplexing or antennas integrated in fenders}	23/0483	. . . . .	{Wireless routers between wheel mounted transmitters and chassis mounted receivers}
23/0445	. . . . .	{Means for changing operating mode, e.g. sleep mode, factory mode or energy saving mode}	23/0484	. . . . .	{Detecting an ongoing tyre inflation}
23/0447	. . . . .	{Wheel or tyre mounted circuits}	23/0486	. . . . .	{comprising additional sensors in the wheel or tyre mounted monitoring device, e.g. movement sensors, microphones or earth magnetic field sensors}
23/0449	. . . . .	{Passive transducers, e.g. using surface acoustic waves, backscatter technology or pressure sensitive resonators (<i>near field passive transducers B60C 23/0428</i>)}	23/0488	. . . . .	{Movement sensor, e.g. for sensing angular speed, acceleration or centripetal force}
23/045	. . . . .	{Means for detecting electromagnetic field changes being not part of the signal transmission <i>per se</i> , e.g. strength, direction, propagation or masking}	23/0489	. . . . .	{for detecting the actual angular position of the monitoring device while the wheel is turning}
23/0452	. . . . .	{Antenna structure, control or arrangement (<i>vehicle tyre mounted antennas H01Q 1/2241</i>)}	23/0491	. . . . .	{Constructional details of means for attaching the control device}
23/0454	. . . . .	{Means for changing operation mode, e.g. sleep mode, factory mode or energy save mode}	23/0493	. . . . .	{for attachment on the tyre}
23/0455	. . . . .	{Transmission control of wireless signals}	23/0494	. . . . .	{Valve stem attachments positioned inside the tyre chamber}
23/0457	. . . . .	{self triggered by timer}	23/0496	. . . . .	{Valve stem attachments positioned outside of the tyre chamber}
23/0459	. . . . .	{self triggered by motion sensor}	23/0498	. . . . .	{for rim attachments (<i>B60C 23/0494, B60C 23/0496 take precedence</i>)}
23/0461	. . . . .	{externally triggered, e.g. by wireless request signal, magnet or manual switch}	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}
23/0462	. . . . .	{Structure of transmission protocol}	23/061	. . . . .	{by monitoring wheel speed (<i>measuring distance traversed on the ground by vehicles G01C 22/00</i>)}
23/0464	. . . . .	{to avoid signal interference}	23/062	. . . . .	{Frequency spectrum analysis of wheel speed signals, e.g. using Fourier transformation}
23/0466	. . . . .	{with signals sent by transmitters mounted on adjacent vehicles}	23/063	. . . . .	{Generating directly an audible signal by deformation of the tyre (<i>by touching the ground B60C 23/085</i>)}
23/0467	. . . . .	{Electric contact means, e.g. slip-rings, rollers, brushes}	23/064	. . . . .	{comprising tyre mounted deformation sensors, e.g. to determine road contact area}
23/0469	. . . . .	{Transmission by sound, e.g. ultra-sound}	23/065	. . . . .	{by monitoring vibrations in tyres or suspensions (<i>B60C 23/062 takes precedence</i>)}
23/0471	. . . . .	{System initialisation, e.g. upload or calibration of operating parameters}	23/066	. . . . .	{by monitoring wheel-centre to ground distance}
23/0472	. . . . .	{to manually allocate ID codes or mounting positions, e.g. by service technicians}	23/067	. . . . .	{by monitoring chassis to ground distance}
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}	23/068	. . . . .	{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 (<i>B60C 23/001 takes precedence</i>)}
			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 (<i>B60C 23/001 takes precedence</i>)}
			23/18	. . . . .	Tyre cooling arrangements {, e.g. heat shields (<i>wheels with cooling fins B60B 19/10</i>)}

- 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
- 25/122 acting on the tyre tread
- 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