

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	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)
1/0008	. {Compositions of the inner liner}	5/025	. . {separated by a part of the tyre (inflatable inserts with several inflatable chambers B60C 5/20)}
1/0016	. {Compositions of the tread}	5/04	. . Shape or construction of inflatable inserts (B60C 5/10 takes precedence)
1/0025	. {Compositions of the sidewalls}	5/08	. . . having reinforcing means
2001/0033	. {Compositions of the sidewall inserts, e.g. for runflat}	5/10	. . . formed as a single discontinuous ring with contiguous ends which may be connected together
1/0041	. {Compositions of the carcass layers}	5/12	. without separate inflatable inserts, e.g. tubeless tyres with transverse section open to the rim (B60C 5/20 takes precedence)
2001/005	. {Compositions of the bead portions, e.g. clinch or chafer rubber or cushion rubber}	5/14	. . with impervious liner or coating on the inner wall of the tyre (B60C 21/04 , B60C 21/08 take precedence)
2001/0058	. . {Compositions of the bead apexes}	5/142	. . . {provided partially, i.e. not covering the whole inner wall}
2001/0066	. {Compositions of the belt layers}	2005/145	. . . {made of laminated layers}
2001/0075	. {Compositions of belt cushioning layers}	2005/147	. . . {characterised by the joint or splice}
2001/0083	. {Compositions of the cap ply layers}	5/16	. . Sealing means between beads and rims, e.g. bands
2001/0091	. {Compositions of non-inflatable or solid tyres}	5/18	. Sectional casings, e.g. comprising replaceable arcuate parts
3/00	Tyres characterised by the transverse section (characterised by rail-engaging elements B60B 17/00)	5/20	. having multiple separate inflatable chambers (with additional tubes which become load supporting in emergency B60C 17/02)
2003/005	. {Twin tyres}	5/22	. . the chambers being annular
3/02	. Closed, e.g. toroidal, tyres	5/24	. . the walls of the chambers extending transversely of the tyre
3/04	. characterised by the relative dimensions of the section, e.g. low profile (B60C 3/06 takes precedence)	7/00	Non-inflatable or solid tyres (B60C 1/00 takes precedence; tyres or rims characterised by rail engaging elements B60B 17/00)
3/06	. Asymmetric {(asymmetric bead seats B60C 15/0236 ; asymmetric bead reinforcement B60C 2015/0696)}	2007/005	. {made by casting, e.g. of polyurethane}
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)}		

7/02	• made from ropes or bristles	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}
7/04	• made of wood or leather	2009/0215	• • {Partial carcass reinforcing plies, i.e. the plies neither crossing the equatorial plane nor folded around the bead core}
7/06	• made of metal	2009/0223	• • {comprising a cushion layer between adjacent carcass plies}
7/08	• built-up from a plurality of arcuate parts	9/023	• • {built up from narrow strips, individual cords or filaments, e.g. using filament winding}
7/10	• characterised by means for increasing resiliency (highly resilient wheels B60B 9/00)	9/0238	• • {characterised by special physical properties of the carcass ply}
7/102	• • {Tyres built-up with separate rubber parts}	2009/0246	• • • {Modulus of the ply}
7/105	• • {using foam material}	2009/0253	• • • • {being different between adjacent plies}
2007/107	• • {comprising lateral openings}	2009/0261	• • • • {being different within the same ply}
7/12	• • using enclosed chambers, e.g. gas-filled (inflatable tyres B60C 5/00)	2009/0269	• • {Physical properties or dimensions of the carcass coating rubber}
7/125	• • • {enclosed chambers defined between rim and tread}	2009/0276	• • • {Modulus; Hardness; Loss modulus or "tangens delta"}
7/14	• • using springs	2009/0284	• • • {Thickness}
7/143	• • • {having a lateral extension disposed in a plane parallel to the wheel axis}	9/0292	• • {Carcass ply curvature (sidewall curvature B60C 13/003)}
2007/146	• • • {extending substantially radially, e.g. like spokes}	9/04	• • the reinforcing cords of each carcass ply arranged in a substantially parallel relationship
7/16	• • • of helical or flat coil form	2009/0408	• • • {Carcass joints or splices}
7/18	• • • • disposed radially relative to wheel axis	2009/0416	• • • {Physical properties or dimensions of the carcass cords}
7/20	• • • • disposed circumferentially relative to wheel axis	2009/0425	• • • • {Diameters of the cords; Linear density thereof}
7/22	• having inlays other than for increasing resiliency, e.g. for armouring	2009/0433	• • • • {Modulus}
7/24	• characterised by means for securing tyres on rim or wheel body	2009/0441	• • • • {Density in width direction}
7/26	• • using bolts	2009/045	• • • • {Tensile strength}
7/28	• • using straps or the like, e.g. vulcanised into the tyre	2009/0458	• • • • {Elongation of the reinforcements at break point}
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}	2009/0466	• • • • {Twist structures}
	NOTE	2009/0475	• • • {Particular materials of the carcass cords}
	When classifying in this group, classification is also made in subclass B32B insofar as any layered product is concerned	2009/0483	• • • {Different cords in the same layer}
9/0007	• {Reinforcements made of metallic elements, e.g. cords, yarns, filaments or fibres made from metal}	2009/0491	• • • {with special path of the carcass cords, e.g. sinusoidal}
2009/0014	• • {Surface treatments of 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)
2009/0021	• • {Coating rubbers for steel cords}	9/07	• • • the cords curve from bead to bead in plural planes, e.g. S-shaped cords
9/0028	• {Reinforcements comprising mineral fibres, e.g. glass or carbon fibres}	9/08	• • • the cords extend transversely from bead to bead, i.e. radial ply (B60C 9/07 takes precedence)
2009/0035	• {Reinforcements made of organic materials, e.g. rayon, cotton or silk}	9/09	• • • • combined with other carcass plies having cords extending diagonally from bead to bead, i.e. combined radial ply and bias angle ply
9/0042	• {Reinforcements made of synthetic materials}	9/10	• • the reinforcing cords within each carcass ply arranged in a crossing relationship
9/005	• {Reinforcements made of different materials, e.g. hybrid or composite cords}	9/11	• • • Woven, braided, or knitted plies
9/0057	• {Reinforcements comprising preshaped elements, e.g. undulated or zig-zag filaments}	9/12	• • built-up with rubberised layers of discrete fibres or filaments
9/0064	• {Reinforcements comprising monofilaments}	9/13	• • • with two or more differing cord materials
2009/0071	• {characterised by special physical properties of the reinforcements}	9/14	• • built-up with sheets, webs, or films of homogeneous material, e.g. synthetics, sheet metal, rubber
2009/0078	• • {Modulus}	2009/145	• • • {at the inner side of the carcass structure}
2009/0085	• • {Tensile strength}		
2009/0092	• • {Twist structure}		
9/02	• Carcasses		

9/16	. . built-up with metallic reinforcing inlays	2009/2077	. . . . {Diameters of the cords; Linear density thereof}
9/17	. . asymmetric to the midcircumferential plane of the tyre	2009/208	. . . . {Modulus of the cords}
9/18	. Structure or arrangement of belts or breakers, crown-reinforcing or cushioning layers	2009/2083	. . . . {Density in width direction}
9/1807	. . {comprising fabric reinforcements}	2009/2087	. . . . . {with variable density in the same layer}
2009/1814	. . . {square woven}	2009/209	. . . . {Tensile strength}
9/1821	. . {comprising discrete fibres or filaments}	2009/2093	. . . . {Elongation of the reinforcements at break point}
2009/1828	. . {characterised by special physical properties of the belt ply}	2009/2096	. . . . {Twist structures}
9/1835	. . {Rubber strips or cushions at the belt edges (compositions B60C 2001/0075)}	9/22	. . . the plies being arranged with all cords disposed along the circumference of the tyre
2009/1842	. . . {Width or thickness of the strips or cushions}	9/2204	. . . . {obtained by circumferentially narrow strip winding}
9/185	. . . {between adjacent or radially below the belt plies}	2009/2209	. . . . . {characterised by tension of the cord during winding}
2009/1857	. . . {radially above the belt plies}	2009/2214	. . . . {characterised by the materials of the zero degree ply cords}
2009/1864	. . . {wrapped around the edges of the belt}	2009/2219	. . . . {with a partial zero degree ply at the belt edges - edge band}
2009/1871	. . {with flat cushions or shear layers between belt layers}	2009/2223	. . . . {with an interrupted zero degree ply, e.g. using two or more portions for the same ply}
2009/1878	. . {with flat cushions or shear layers between the carcass and the belt}	2009/2228	. . . . {characterised by special physical properties of the zero degree plies}
2009/1885	. . {with belt ply between adjacent carcass plies}	2009/2233	. . . . . {Modulus of the zero degree ply}
2009/1892	. . {with belt ply radial inside the carcass structure}	2009/2238	. . . . {Physical properties or dimensions of the ply coating rubber}
9/20	. . built-up from rubberised plies each having all cords arranged substantially parallel	2009/2242	. . . . . {Modulus; Hardness; Loss modulus or "tangens delta"}
9/2003	. . . {characterised by the materials of the belt cords}	2009/2247	. . . . . {Thickness}
9/2006	. . . . {consisting of steel cord plies only}	2009/2252	. . . . {Physical properties or dimension of the zero degree ply cords}
9/2009	. . . . {comprising plies of different materials}	2009/2257	. . . . . {Diameters of the cords; Linear density thereof}
2009/2012	. . . {with particular configuration of the belt cords in the respective belt layers}	2009/2261	. . . . . {Modulus of the cords}
2009/2016	. . . . {comprising cords at an angle of 10 to 30 degrees to the circumferential direction}	2009/2266	. . . . . {Density of the cords in width direction}
2009/2019	. . . . {comprising cords at an angle of 30 to 60 degrees to the circumferential direction}	2009/2271	. . . . . {with variable density}
2009/2022	. . . . {comprising cords at an angle of 60 to 90 degrees to the circumferential direction}	2009/2276	. . . . . {Tensile strength}
2009/2025	. . . . {with angle different or variable in the same layer}	2009/228	. . . . . {Elongation of the reinforcements at break point}
2009/2029	. . . . {with different cords in the same layer, i.e. cords with different materials or dimensions}	2009/2285	. . . . . {Twist structures}
2009/2032	. . . . {characterised by the course of the belt cords, e.g. undulated or sinusoidal}	2009/229	. . . . . {characterised by the course of the cords, e.g. undulated or sinusoidal}
2009/2035	. . . {built-up by narrow strips}	2009/2295	. . . . . {with different cords in the same layer}
2009/2038	. . . {using lateral belt strips at belt edges, e.g. edge bands}	9/24	. . built-up of arcuate parts
2009/2041	. . . {with an interrupted belt ply, e.g. using two or more portions of the same ply}	9/26	. . . . . {Folded plies}
2009/2045	. . . {with belt joints or splices}	9/263	. . . {further characterised by an endless zigzag configuration in at least one belt ply, i.e. no cut edge being present}
2009/2048	. . . {characterised by special physical properties of the belt plies}	2009/266	. . . . . {combined with non folded cut-belt plies}
2009/2051	. . . . {Modulus of the ply}	9/28	. . characterised by the belt or breaker dimensions or curvature relative to carcass (B60C 9/30 takes precedence)
2009/2054	. . . . . {being different within the same ply}	2009/283	. . . {characterised by belt curvature}
2009/2058	. . . . . {being different between adjacent plies}	2009/286	. . . . {being substantially flat}
2009/2061	. . . {Physical properties or dimensions of the belt coating rubber}	9/30	. . asymmetric to the midcircumferential plane of the tyre
2009/2064	. . . . {Modulus; Hardness; Loss modulus or "tangens delta"}	11/00	Tyre tread bands; Tread patterns; Anti-skid inserts
2009/2067	. . . . {Thickness}	11/0008	. {characterised by the tread rubber}
2009/207	. . . . {Double layers, e.g. using different rubbers in the same belt ply}	2011/0016	. . {Physical properties or dimensions}
2009/2074	. . . {Physical properties or dimension of the belt cord}	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}	2011/0376	. . . . . {characterised by width}
11/0058	. . . {with different cap rubber layers in the axial direction}	2011/0379	. . . . . {characterised by depth}
11/0066	. . . . {having an asymmetric arrangement}	2011/0381	. . . . . {Blind or isolated grooves}
11/0075	. . . {with different base rubber layers in the axial direction}	2011/0383	. . . . . {at the centre of the tread}
11/0083	. {characterised by the curvature of the tyre tread}	2011/0386	. . . {Continuous ribs}
2011/0091	. {built-up by narrow strip winding}	2011/0388	. . . . {provided at the equatorial plane}
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)	2011/039	. . . . {provided at the shoulder portion}
2011/013	. . {provided with a recessed portion}	2011/0393	. . . . {Narrow ribs, i.e. having a rib width of less than 8 mm}
2011/016	. . {different rubber for tread wings}	2011/0395	. . . . . {for linking shoulder blocks}
11/02	. Replaceable treads	2011/0397	. . . . {Sacrificial ribs, i.e. ribs recessed from outer tread contour}
11/03	. Tread patterns	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)
11/0302	. . {directional pattern, i.e. with main rolling direction}	11/042	. . . {further characterised by the groove cross-section}
11/0304	. . {Asymmetric patterns}	11/045	. . . . {the groove walls having a three-dimensional shape}
11/0306	. . {Patterns comprising block rows or discontinuous ribs}	11/047	. . . . {the groove bottom comprising stone trapping protection elements, e.g. ribs}
11/0309	. . . {further characterised by the groove cross-section}	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)
11/0311	. . {Patterns comprising tread lugs arranged parallel or oblique to the axis of rotation}	11/12	. . characterised by the use of narrow slits or incisions, e.g. sipes
2011/0313	. . . {directional type}	11/1204	. . . {with special shape of the sipe}
11/0316	. . . {further characterised by the groove cross-section}	2011/1209	. . . . {straight at the tread surface}
11/0318	. . {irregular patterns with particular pitch sequence}	2011/1213	. . . . {sinusoidal or zigzag at the tread surface}
11/032	. . {Patterns comprising isolated recesses}	11/1218	. . . . {Three-dimensional shape with regard to depth and extending direction}
11/0323	. . . {tread comprising channels under the tread surface, e.g. for draining water}	11/1222	. . . . {Twisted or warped shape in the sipe plane}
2011/0325	. . {Irregular patterns with particular pitch sequence}	2011/1227	. . . . {having different shape within the pattern}
11/0327	. . {characterised by special properties of the tread pattern}	2011/1231	. . . . {being shallow, i.e. sipe depth of less than 3 mm}
11/033	. . . {by the void or net-to-gross ratios of the patterns}	11/1236	. . . {with special arrangements in the tread pattern}
11/0332	. . . {by the footprint-ground contacting area of the tyre tread}	11/124	. . . . {inclined with regard to a plane normal to the tread surface}
2011/0334	. . . {Stiffness}	2011/1245	. . . . {being arranged in crossing relation, e.g. sipe mesh}
2011/0337	. . {characterised by particular design features of the pattern}	11/125	. . . . {arranged at the groove bottom}
2011/0339	. . . {Grooves}	2011/1254	. . . . {with closed sipe, i.e. not extending to a groove}
2011/0341	. . . . {Circumferential grooves}	11/1259	. . . {Depth of the sipe}
2011/0344	. . . . . {provided at the equatorial plane}	11/1263	. . . . {different within the same sipe}
2011/0346	. . . . . {with zigzag shape}	2011/1268	. . . . {being different from sipe to sipe}
2011/0348	. . . . . {Narrow grooves, i.e. having a width of less than 4 mm}	11/1272	. . . {Width of the sipe}
2011/0351	. . . . . {Shallow grooves, i.e. having a depth of less than 50% of other grooves}	2011/1277	. . . . {being narrow, i.e. less than 0.3 mm}
2011/0353	. . . . . {characterised by width}	11/1281	. . . . {different within the same sipe, i.e. enlarged width portion at sipe bottom or along its length}
2011/0355	. . . . . {characterised by depth}	2011/1286	. . . . {being different from sipe to sipe}
2011/0358	. . . . {Lateral grooves, i.e. having an angle of 45 to 90 degrees to the equatorial plane}	2011/129	. . . {Sipe density, i.e. the distance between the sipes within the pattern}
2011/036	. . . . . {Narrow grooves, i.e. having a width of less than 3 mm}	2011/1295	. . . . {variable}
2011/0362	. . . . . {Shallow grooves, i.e. having a depth of less than 50% of other grooves}	11/13	. . characterised by the groove cross-section, e.g. for buttressing or preventing stone-trapping
2011/0365	. . . . . {characterised by width}	11/1307	. . . {with special features of the groove walls}
2011/0367	. . . . . {characterised by depth}	11/1315	. . . . {having variable inclination angles, e.g. warped groove walls}
2011/0369	. . . . . {with varying depth of the groove}	11/1323	. . . . {asymmetric}
2011/0372	. . . . . {with particular inclination angles}	2011/133	. . . . {comprising recesses}
2011/0374	. . . . {Slant grooves, i.e. having an angle of about 5 to 35 degrees to the equatorial plane}	2011/1338	. . . . {comprising protrusions}

11/1346	. . . . {covered by a rubber different from the tread rubber}	13/009	. {comprising additional bead cores in the sidewall}
11/1353	. . . {with special features of the groove bottom}	13/02	. Arrangement of grooves or ribs
2011/1361	. . . . {with protrusions extending from the groove bottom}	13/023	. . {preventing watersplash}
11/1369	. . . {Tie bars for linking block elements and bridging the groove}	2013/026	. . {provided at the interior side only}
11/1376	. . . {Three dimensional block surfaces departing from the enveloping tread contour}	13/04	. having annular inlays or covers, e.g. white sidewalls
11/1384	. . . . {with chamfered block corners}	2013/045	. . {comprising different sidewall rubber layers}
11/1392	. . . . {with chamfered block edges}		
11/14	. Anti-skid inserts, e.g. vulcanised into the tread band	15/00	Tyre beads, e.g. ply turn-up or overlap
2011/142	. . {Granular particles, e.g. hard granules}	15/0009	. {features of the carcass terminal portion}
2011/145	. . {Discontinuous fibres}	15/0018	. . {not folded around the bead core, e.g. floating or down ply}
2011/147	. . {Foamed rubber or sponge rubber on the tread band}	15/0027	. . {with low ply turn-up, i.e. folded around the bead core and terminating at the bead core}
11/16	. . of plug form, e.g. made from metal, textile	15/0036	. . {with high ply turn-up, i.e. folded around the bead core and terminating radially above the point of maximum section width}
11/1606	. . . {retractable plug}	15/0045	. . . {with ply turn-up up to the belt edges, i.e. folded around the bead core and extending to the belt edges}
11/1612	. . . . {actuated by fluid, e.g. using fluid pressure difference}	15/0054	. . {with ply turn-up portion parallel and adjacent to carcass main portion}
11/1618	. . . . {actuated by temperature, e.g. by means of temperature sensitive elements}	15/0063	. . {with ply turn-up portion diverging from carcass main portion}
11/1625	. . . {Arrangements thereof in the tread patterns, e.g. irregular}	15/0072	. . {with ply reverse folding, i.e. carcass layer folded around the bead core from the outside to the inside}
11/1631	. . . {inclined with regard to the radial direction}	15/0081	. . {the carcass plies folded around or between more than one bead core}
11/1637	. . . {Attachment of the plugs into the tread, e.g. screwed}	2015/009	. . {Height of the carcass terminal portion defined in terms of a numerical value or ratio in proportion to section height}
11/1643	. . . {with special shape of the plug-body portion, i.e. not cylindrical}		
11/165	. . . . {conical}	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)
11/1656	. . . . {concave or convex, e.g. barrel-shaped}	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)}
11/1662	. . . . {helical-shaped}	15/0206	. . {using inside rim bead seating, i.e. the bead being seated at a radially inner side of the rim}
11/1668	. . . . {with an additional collar}	15/0209	. . {Supplementary means for securing the bead}
11/1675	. . . {with special shape of the plug- tip}	15/0213	. . . {the bead being clamped by rings, cables, rim flanges or other parts of the rim}
11/1681	. . . . {Spherical top portions}	15/0216	. . . {the bead being pierced by bolts, rivets, clips or other elements}
11/1687	. . . . {Multiple tips}	15/022	. . . {the bead being secured by turned-in rim flanges, e.g. rim of the clincher type}
11/1693	. . . {Attachment of the plug-tip within the plug-body}	15/0223	. . . {the bead being secured by clip-hook elements not forming part of the rim flange}
11/18	. . of strip form, e.g. metallic combs, rubber strips of different wear resistance (B60C 11/20 takes precedence)	15/0226	. . . {the bead being secured by protrusions of the rim extending from the bead seat, e.g. hump or serrations}
11/185	. . . {of metal comb form, lamellar shaped or blade-like}	15/023	. . . {the bead being secured by bead extensions which extend over and wrap around the rim flange}
11/20	. . in coiled form	15/0233	. . {Securing tyres without beads; Securing closed torus or tubular tyres}
11/22	. Tread rings between dual 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)}
11/24	. Wear-indicating arrangements	15/024	. . Bead contour, e.g. lips, grooves or ribs
11/243	. . {Tread wear sensors, e.g. electronic sensors}	15/0242	. . . {with bead extensions located radially outside the rim flange position, e.g. rim flange protectors}
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}		

2015/0245	. . . {Bead lips at the bead toe portion, i.e. the axially and radially inner end of the bead}	2015/0675	. . . . {characterised by the course of the cords, e.g. undulated or sinusoidal}
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}	2015/0678	. . . {Physical properties of the bead reinforcing layer, e.g. modulus of the ply}
15/028	. . Spacers between beads (emergency load supporting means B60C 17/00)	2015/0682	. . . {Physical properties or dimensions of the coating rubber}
15/032	. . . inflatable	2015/0685	. . . {Physical properties or dimensions of the cords, e.g. modulus of the cords}
15/036	. . Tyres permanently fixed to the rim, e.g. by adhesive, by vulcanisation	2015/0689	. . . . {Cord density in width direction}
15/04	. Bead cores (producing bead-rings or bead-cores for tyres B29D 30/48)	2015/0692	. . . {characterised by particular materials of the cords}
2015/042	. . {characterised by the material of the core, e.g. alloy}	2015/0696	. . {Asymmetric bead reinforcement, e.g. arrangement of bead reinforcing layer or apex}
2015/044	. . {characterised by a wrapping layer}	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)
2015/046	. . {Cable cores, i.e. cores made-up of twisted wires}	17/0009	. {comprising sidewall rubber inserts, e.g. crescent shaped inserts}
2015/048	. . {Polygonal cores characterised by the winding sequence}	17/0018	. . {two or more inserts in each sidewall portion}
15/05	. . Multiple, i.e. with two or more cores in each bead	17/0027	. . {comprising portions of different rubbers in a single insert}
15/06	. Flipper strips, fillers, or chafing strips {and reinforcing layers for the construction of the bead}	17/0036	. . {comprising additional reinforcements}
15/0603	. . {characterised by features of the bead filler or apex (compositions of the apex rubber B60C 2001/0058)}	17/0045	. . {comprising grooves or ribs, e.g. at the inner side of the insert}
15/0607	. . . {comprising several parts, e.g. made of different rubbers}	2017/0054	. . {Physical properties or dimensions of the inserts}
2015/061	. . . {Dimensions of the bead filler in terms of numerical values or ratio in proportion to section height}	2017/0063	. . . {Modulus; Hardness; Loss modulus or "tangens delta"}
2015/0614	. . {characterised by features of the chafer or clinch portion, i.e. the part of the bead contacting the rim}	2017/0072	. . . {Thickness}
2015/0617	. . {comprising a cushion rubber other than the chafer or clinch rubber}	2017/0081	. {comprising special reinforcing means in the crown area}
2015/0621	. . . {adjacent to the carcass turnup portion}	17/009	. {comprising annular protrusions projecting into the tyre cavity}
2015/0625	. . . {provided at the terminal edge portion of a carcass or reinforcing layer}	17/01	. utilising additional inflatable supports which become load supporting in emergency
15/0628	. . {comprising a bead reinforcing layer}	17/02	. . inflated or expanded in emergency only
15/0632	. . . {using flippers in contact with and wrapped around the bead core and, at least partially, in contact with the bead filler}	17/04	. utilising additional non-inflatable supports which become load-supporting in emergency
15/0635	. . . {using chippers between the carcass layer and chafer rubber wrapped around the bead}	17/041	. . {characterised by coupling or locking means between rim and support}
2015/0639	. . . {between carcass main portion and bead filler not wrapped around the bead core}	17/042	. . . {preventing sliding or rotation between support and rim}
2015/0642	. . . {between carcass turn-up and bead filler not wrapped around the bead core}	17/043	. . {made-up of an annular metallic shell}
2015/0646	. . . {at the axially inner side of the carcass main portion not wrapped around the bead core}	17/044	. . {Expandable supports}
2015/065	. . . {at the axially outer side of the carcass turn-up portion not wrapped around the bead core}	17/045	. . {Rotatable supports relative to the rim}
15/0653	. . . {with particular configuration of the cords in the respective bead reinforcing layer}	17/046	. . . {by means of ball bearings}
2015/0657	. . . . {comprising cords at an angle of maximal 10 degrees to the circumferential direction}	17/047	. . {comprising circumferential ribs}
2015/066	. . . . {comprising cords at an angle of 10 to 30 degrees to the circumferential direction}	17/048	. . {comprising transverse ribs}
2015/0664	. . . . {comprising cords at an angle of 30 to 60 degrees to the circumferential direction}	17/06	. . resilient
2015/0667	. . . . {comprising cords at an angle of 60 to 90 degrees to the circumferential direction}	17/061	. . . {comprising lateral openings}
2015/0671	. . . . {the cord angle being different or variable within the same layer}	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}	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	23/0437	. . . . . {Means for detecting electromagnetic field changes not being part of the signal transmission per se , e.g. strength, direction, propagation or masking}
23/001	. {Devices for manually or automatically controlling or distributing tyre pressure whilst the vehicle is moving}	23/0438	. . . . . {comprising signal transmission means, e.g. for a bidirectional communication with a corresponding wheel mounted receiver}
23/002	. . {by monitoring conditions other than tyre pressure or deformation}	23/044	. . . . . {Near field triggers, e.g. magnets or triggers with 125 KHz}
23/003	. . {the control being done on the vehicle, i.e. comprising a rotating joint between a vehicle mounted tank and the tyre}	23/0442	. . . . . {the transmitted signal comprises further information, e.g. instruction codes, sensor characteristics or identification data}
23/004	. . {the control being done on the wheel, e.g. using a wheel-mounted reservoir}	23/0444	. . . . . {Antenna structures, control or arrangements thereof, e.g. for directional antennas, diversity antenna, antenna multiplexing or antennas integrated in fenders}
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}		

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