

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

7/00	Non-inflatable or solid tyres (B60C 1/00 takes precedence; tyres or rims characterised by rail engaging elements B60B 17/00)	2009/0092	. . {Twist structure}
		9/02	. Carcasses
2007/005	. {made by casting, e.g. of polyurethane}	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}
7/02	. made from ropes or bristles		
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. turnout 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}		
2009/0078	. . {Modulus}		
2009/0085	. . {Tensile strength}		

9/14	. . built-up with sheets, webs, or films of homogeneous material, e.g. synthetics, sheet metal, rubber	2009/207	. . . . {Double layers, e.g. using different rubbers in the same belt ply}
2009/145	. . . {at the inner side of the carcass structure}	2009/2074	. . . {Physical properties or dimension of the belt cord}
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}

2011/0016	. . {Physical properties or dimensions}	2011/0369	. . . . . {with varying depth of the groove}
2011/0025	. . . {Modulus or tan delta}	2011/0372	. . . . . {with particular inclination angles}
2011/0033	. . . {Thickness of the tread}	2011/0374	. . . . {Slant grooves, i.e. having an angle of about 5 to 35 degrees to the equatorial plane}
11/0041	. {comprising different tread rubber layers}	2011/0376	. . . . . {characterised by width}
11/005	. . {with cap and base layers}	2011/0379	. . . . . {characterised by depth}
11/0058	. . . {with different cap rubber layers in the axial direction}	2011/0381	. . . . {Blind or isolated grooves}
11/0066	. . . . {having an asymmetric arrangement}	2011/0383	. . . . . {at the centre of the tread}
11/0075	. . . {with different base rubber layers in the axial direction}	2011/0386	. . . {Continuous ribs}
11/0083	. {characterised by the curvature of the tyre tread}	2011/0388	. . . . {provided at the equatorial plane}
2011/0091	. {built-up by narrow strip winding}	2011/039	. . . . {provided at the shoulder portion}
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)	2011/0393	. . . . {Narrow ribs, i.e. having a rib width of less than 8 mm}
2011/013	. . {provided with a recessed portion}	2011/0395	. . . . . {for linking shoulder blocks}
2011/016	. . {different rubber for tread wings}	2011/0397	. . . . {Sacrificial ribs, i.e. ribs recessed from outer tread contour}
11/02	. Replaceable treads	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)
11/03	. Tread patterns	11/042	. . . {further characterised by the groove cross-section}
11/0302	. . {directional pattern, i.e. with main rolling direction}	11/045	. . . . {the groove walls having a three-dimensional shape}
11/0304	. . {Asymmetric patterns}	11/047	. . . . {the groove bottom comprising stone trapping protection elements, e.g. ribs}
11/0306	. . {Patterns comprising block rows or discontinuous ribs}	11/11	. . in which the raised area of the pattern consists only of isolated elements, e.g. blocks (B60C 11/12 , B60C 11/13 take precedence)
11/0309	. . . {further characterised by the groove cross-section}	11/12	. . characterised by the use of narrow slits or incisions, e.g. sipes
11/0311	. . {Patterns comprising tread lugs arranged parallel or oblique to the axis of rotation}	11/1204	. . . {with special shape of the sipe}
2011/0313	. . . {directional type}	2011/1209	. . . . {straight at the tread surface}
11/0316	. . . {further characterised by the groove cross-section}	2011/1213	. . . . {sinusoidal or zigzag at the tread surface}
11/0318	. . {irregular patterns with particular pitch sequence}	11/1218	. . . . {Three-dimensional shape with regard to depth and extending direction}
11/032	. . {Patterns comprising isolated recesses}	11/1222	. . . . {Twisted or warped shape in the sipe plane}
11/0323	. . . {tread comprising channels under the tread surface, e.g. for draining water}	2011/1227	. . . . {having different shape within the pattern}
2011/0325	. . {Irregular patterns with particular pitch sequence}	2011/1231	. . . . {being shallow, i.e. sipe depth of less than 3 mm}
11/0327	. . {characterised by special properties of the tread pattern}	11/1236	. . . {with special arrangements in the tread pattern}
11/033	. . . {by the void or net-to-gross ratios of the patterns}	11/124	. . . . {inclined with regard to a plane normal to the tread surface}
11/0332	. . . {by the footprint-ground contacting area of the tyre tread}	2011/1245	. . . . {being arranged in crossing relation, e.g. sipe mesh}
2011/0334	. . . {Stiffness}	11/125	. . . . {arranged at the groove bottom}
2011/0337	. . {characterised by particular design features of the pattern}	2011/1254	. . . . {with closed sipe, i.e. not extending to a groove}
2011/0339	. . . {Grooves}	11/1259	. . . {Depth of the sipe}
2011/0341	. . . . {Circumferential grooves}	11/1263	. . . . {different within the same sipe}
2011/0344	. . . . . {provided at the equatorial plane}	2011/1268	. . . . {being different from sipe to sipe}
2011/0346	. . . . . {with zigzag shape}	11/1272	. . . {Width of the sipe}
2011/0348	. . . . . {Narrow grooves, i.e. having a width of less than 4 mm}	2011/1277	. . . . {being narrow, i.e. less than 0.3 mm}
2011/0351	. . . . . {Shallow grooves, i.e. having a depth of less than 50% of other grooves}	11/1281	. . . . {different within the same sipe, i.e. enlarged width portion at sipe bottom or along its length}
2011/0353	. . . . . {characterised by width}	2011/1286	. . . . {being different from sipe to sipe}
2011/0355	. . . . . {characterised by depth}	2011/129	. . . {Sipe density, i.e. the distance between the sipes within the pattern}
2011/0358	. . . . {Lateral grooves, i.e. having an angle of 45 to 90 degrees to the equatorial plane}	2011/1295	. . . . {variable}
2011/036	. . . . . {Narrow grooves, i.e. having a width of less than 3 mm}	11/13	. . characterised by the groove cross-section, e.g. for buttressing or preventing stone-trapping
2011/0362	. . . . . {Shallow grooves, i.e. having a depth of less than 50% of other grooves}	11/1307	. . . {with special features of the groove walls}
2011/0365	. . . . . {characterised by width}		
2011/0367	. . . . . {characterised by depth}		

11/1315	. . . . {having variable inclination angles, e.g. warped groove walls}	2013/005	. {Physical properties of the sidewall rubber}
11/1323	. . . . {asymmetric}	2013/006	. . {Modulus; Hardness; Loss modulus or "tangens delta"}
2011/133	. . . . {comprising recesses}	2013/007	. . {Thickness}
2011/1338	. . . . {comprising protrusions}	2013/008	. {built-up by narrow strip winding}
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		
11/24	. Wear-indicating arrangements		
11/243	. . {Tread wear sensors, e.g. electronic sensors}		
11/246	. . {Tread wear monitoring systems (tyre pressure monitoring B60C 23/04)}		
13/00	Tyre sidewalls; Protecting, decorating, marking, or the like, thereof (B60C 17/08 takes precedence; tyre shoulders B60C 11/01)		
13/001	. {Decorating, marking or the like}		
13/002	. {Protection against exterior elements}		
13/003	. {characterised by sidewall curvature (carcass ply curvature B60C 9/0292)}		
13/004	. . {of the internal side of the tyre}		

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)}	2015/066	. . . . {comprising cords at an angle of 10 to 30 degrees to the circumferential direction}
15/024	. . Bead contour, e.g. lips, grooves or ribs	2015/0664	. . . . {comprising cords at an angle of 30 to 60 degrees to the circumferential direction}
15/0242	. . . {with bead extensions located radially outside the rim flange position, e.g. rim flange protectors}	2015/0667	. . . . {comprising cords at an angle of 60 to 90 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}	2015/0671	. . . . {the cord angle being different or variable within the same layer}
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}	2015/0675	. . . . {characterised by the course of the cords, e.g. undulated or sinusoidal}
15/028	. . Spacers between beads (emergency load supporting means B60C 17/00)	2015/0678	. . . {Physical properties of the bead reinforcing layer, e.g. modulus of the ply}
15/032	. . . inflatable	2015/0682	. . . {Physical properties or dimensions of the coating rubber}
15/036	. . Tyres permanently fixed to the rim, e.g. by adhesive, by vulcanisation	2015/0685	. . . {Physical properties or dimensions of the cords, e.g. modulus of the cords}
15/04	. Bead cores (producing bead-rings or bead-cores for tyres B29D 30/48)	2015/0689	. . . . {Cord density in width direction}
2015/042	. . {characterised by the material of the core, e.g. alloy}	2015/0692	. . . {characterised by particular materials of the cords}
2015/044	. . {characterised by a wrapping layer}	2015/0696	. . {Asymmetric bead reinforcement, e.g. arrangement of bead reinforcing layer or apex}
2015/046	. . {Cable cores, i.e. cores made-up of twisted wires}		
2015/048	. . {Polygonal cores characterised by the winding sequence}	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)
15/05	. . Multiple, i.e. with two or more cores in each bead	17/0009	. {comprising sidewall rubber inserts, e.g. crescent shaped inserts}
15/06	. Flipper strips, fillers, or chafing strips {and reinforcing layers for the construction of the bead}	17/0018	. . {two or more inserts in each sidewall portion}
15/0603	. . {characterised by features of the bead filler or apex (compositions of the apex rubber B60C 2001/0058)}	17/0027	. . {comprising portions of different rubbers in a single insert}
15/0607	. . . {comprising several parts, e.g. made of different rubbers}	17/0036	. . {comprising additional reinforcements}
2015/061	. . . {Dimensions of the bead filler in terms of numerical values or ratio in proportion to section height}	17/0045	. . {comprising grooves or ribs, e.g. at the inner side of the insert}
2015/0614	. . {characterised by features of the chafer or clinch portion, i.e. the part of the bead contacting the rim}	2017/0054	. . {Physical properties or dimensions of the inserts}
2015/0617	. . {comprising a cushion rubber other than the chafer or clinch rubber}	2017/0063	. . . {Modulus; Hardness; Loss modulus or "tangens delta"}
2015/0621	. . . {adjacent to the carcass turnup portion}	2017/0072	. . . {Thickness}
2015/0625	. . . {provided at the terminal edge portion of a carcass or reinforcing layer}	2017/0081	. {comprising special reinforcing means in the crown area}
15/0628	. . {comprising a bead reinforcing layer}	17/009	. {comprising annular protrusions projecting into the tyre cavity}
15/0632	. . . {using flippers in contact with and wrapped around the bead core and, at least partially, in contact with the bead filler}	17/01	. utilising additional inflatable supports which become load supporting in emergency
15/0635	. . . {using chippers between the carcass layer and chafer rubber wrapped around the bead}	17/02	. . inflated or expanded in emergency only
2015/0639	. . . {between carcass main portion and bead filler not wrapped around the bead core}	17/04	. utilising additional non-inflatable supports which become load-supporting in emergency
2015/0642	. . . {between carcass turn-up and bead filler not wrapped around the bead core}	17/041	. . {characterised by coupling or locking means between rim and support}
2015/0646	. . . {at the axially inner side of the carcass main portion not wrapped around the bead core}	17/042	. . . {preventing sliding or rotation between support and rim}
2015/065	. . . {at the axially outer side of the carcass turn-up portion not wrapped around the bead core}	17/043	. . {made-up of an annular metallic shell}
15/0653	. . . {with particular configuration of the cords in the respective bead reinforcing layer}	17/044	. . {Expandable supports}
2015/0657	. . . . {comprising cords at an angle of maximal 10 degrees to the circumferential direction}	17/045	. . {Rotatable supports relative to the rim}
		17/046	. . . {by means of ball bearings}
		17/047	. . {comprising circumferential ribs}
		17/048	. . {comprising transverse ribs}
		17/06	. . resilient
		17/061	. . . {comprising lateral openings}
		2017/063	. . . {comprising circumferentially extending reinforcements}
		17/065	. . . {made-up of foam inserts (tyres filled with foam B60C 5/002)}

17/066	. . . {made-up of plural spherical elements provided in the tyre chamber}	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}
19/00	Tyre parts or constructions not otherwise provided for	23/0403	. . . . {Mechanically generated audible signals, e.g. by buzzer or whistle signals}
19/001	. {Tyres requiring an asymmetric or a special mounting}	23/0405	. . . . {Mechanically generated visible signals, e.g. by using a gauge needle}
19/002	. {Noise damping elements provided in the tyre structure or attached thereto, e.g. in the tyre interior}	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)}
19/003	. {Balancing means attached to the tyre}	23/0408	. . . {transmitting the signals by non-mechanical means from the wheel or tyre to a vehicle body mounted receiver}
2019/004	. {Tyre sensors other than for detecting tyre pressure}	23/041	. . . . {Means for supplying power to the signal-transmitting means on the wheel}
2019/005	. {Magnets integrated within the tyre structure}	23/0411	. . . . . {Piezo-electric generators}
2019/006	. {Warning devices, e.g. devices generating noise due to flat or worn tyres}	23/0413	. . . . . {Wireless charging of active radio frequency circuits}
2019/007	. . {triggered by sensors}	23/0415	. . . . {Automatically identifying wheel mounted units, e.g. after replacement or exchange of wheels}
2019/008	. {Venting means, e.g. for expelling entrapped air}	23/0416	. . . . . {allocating a corresponding wheel position on vehicle, e.g. front/left or rear/right}
19/04	. Tyres with openings closeable by means other than the rim; Closing means therefor	23/0418	. . . . {Sharing hardware components like housing, antenna, receiver or signal transmission line with other vehicle systems like keyless entry or brake control units}
19/08	. Electric charge dissipating arrangements	23/042	. . . . . {cooperating with wheel hub mounted speed sensors}
19/082	. . {comprising a conductive tread insert}	23/0422	. . . . {characterised by the type of signal transmission means}
19/084	. . {using conductive carcasses}	23/0423	. . . . . {Photo-electric, infra-red or visible light means}
19/086	. . {using conductive sidewalls}	23/0425	. . . . . {Means comprising permanent magnets, e.g. Hall-effect or Reed-switches}
19/088	. . {using conductive beads}	23/0427	. . . . . {Near field transmission with inductive or capacitive coupling means}
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)	23/0428	. . . . . {using passive wheel mounted resonance circuits}
19/122	. . {disposed inside of the inner liner}	23/043	. . . . . {using transformer type signal transducers, e.g. rotary transformers}
19/125	. . {disposed removably on the tyre}	23/0432	. . . . . {using vehicle structural parts as signal path, e.g. chassis, axle or fender}
19/127	. . {for inner tubes}	23/0433	. . . . . {Radio signals}
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	23/0435	. . . . . {Vehicle body mounted circuits, e.g. transceiver or antenna fixed to central console, door, roof, mirror or fender}
23/001	. {Devices for manually or automatically controlling or distributing tyre pressure whilst the vehicle is moving}	23/0437	. . . . . {Means for detecting electromagnetic field changes not being part of the signal transmission per se , e.g. strength, direction, propagation or masking}
23/002	. . {by monitoring conditions other than tyre pressure or deformation}	23/0438	. . . . . {comprising signal transmission means, e.g. for a bidirectional communication with a corresponding wheel mounted receiver}
23/003	. . {the control being done on the vehicle, i.e. comprising a rotating joint between a vehicle mounted tank and the tyre}	23/044	. . . . . {Near field triggers, e.g. magnets or triggers with 125 KHz}
23/004	. . {the control being done on the wheel, e.g. using a wheel-mounted reservoir}		
23/005	. {Devices specially adapted for special wheel arrangements}		
	NOTE		
	B60C 23/001 , B60C 23/02 , B60C 23/04 , B60C 23/06 or B60C 23/08		
23/006	. . {having two wheels only}		

23/0442	. . . . .	{the transmitted signal comprises further information, e.g. instruction codes, sensor characteristics or identification data}	23/0483	. . . .	{Wireless routers between wheel mounted transmitters and chassis mounted receivers}
23/0444	. . . . .	{Antenna structures, control or arrangements thereof, e.g. for directional antennas, diversity antenna, antenna multiplexing or antennas integrated in fenders}	23/0484	. . . .	{Detecting an ongoing tyre inflation}
23/0445	. . . . .	{Means for changing operating mode, e.g. sleep mode, factory mode or energy saving mode}	23/0486	. . .	{comprising additional sensors in the wheel or tyre mounted monitoring device, e.g. movement sensors, microphones or earth magnetic field sensors}
23/0447	. . . . .	{Wheel or tyre mounted circuits}	23/0488	. . . .	{Movement sensor, e.g. for sensing angular speed, acceleration or centripetal force}
23/0449	. . . . .	{Passive transducers, e.g. using surface acoustic waves, backscatter technology or pressure sensitive resonators (near field passive transducers B60C 23/0428)}	23/0489	. . . .	{for detecting the actual angular position of the monitoring device while the wheel is turning}
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}	23/0491	. . .	{Constructional details of means for attaching the control device}
23/0452	. . . . .	{Antenna structure, control or arrangement (vehicle tyre mounted antennas H01Q 1/2241)}	23/0493	. . . .	{for attachment on the tyre}
23/0454	. . . . .	{Means for changing operation mode, e.g. sleep mode, factory mode or energy save mode}	23/0494	. . . .	{Valve stem attachments positioned inside the tyre chamber}
23/0455	. . . . .	{Transmission control of wireless signals}	23/0496	. . . .	{Valve stem attachments positioned outside of the tyre chamber}
23/0457	. . . . .	{self triggered by timer}	23/0498	. . . .	{for rim attachments (B60C 23/0494 , B60C 23/0496 take precedence)}
23/0459	. . . . .	{self triggered by motion sensor}	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}
23/0461	. . . . .	{externally triggered, e.g. by wireless request signal, magnet or manual switch}	23/061	. .	{by monitoring wheel speed (measuring distance traversed on the ground by vehicles G01C 22/00)}
23/0462	. . . . .	{Structure of transmission protocol}	23/062	. . .	{Frequency spectrum analysis of wheel speed signals, e.g. using Fourier transformation}
23/0464	. . . . .	{to avoid signal interference}	23/063	. .	{Generating directly an audible signal by deformation of the tyre (by touching the ground B60C 23/085)}
23/0466	. . . . .	{with signals sent by transmitters mounted on adjacent vehicles}	23/064	. .	{comprising tyre mounted deformation sensors, e.g. to determine road contact area}
23/0467	. . . . .	{Electric contact means, e.g. slip-rings, rollers, brushes}	23/065	. .	{by monitoring vibrations in tyres or suspensions (B60C 23/062 takes precedence)}
23/0469	. . . . .	{Transmission by sound, e.g. ultra-sound}	23/066	. .	{by monitoring wheel-centre to ground distance}
23/0471	. . . . .	{System initialisation, e.g. upload or calibration of operating parameters}	23/067	. .	{by monitoring chassis to ground distance}
23/0472	. . . . .	{to manually allocate ID codes or mounting positions, e.g. by service technicians}	23/068	. .	{by monitoring chassis to tyre 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}	23/08	. .	by touching the ground
23/0476	. . . . .	{Temperature compensation of measured pressure values}	23/085	. . .	{putting directly into action an audible signal}
23/0477	. . . . .	{Evaluating waveform of pressure readings}	23/10	. .	Arrangements of tyre-inflating pumps mounted on vehicles (B60C 23/001 takes precedence)}
23/0479	. . . . .	{Communicating with external units being not part of the vehicle, e.g. tools for diagnostic, mobile phones, electronic keys or service stations}	23/105	. .	{the pump being mounted in the saddle-pillar of a bicycle}
23/0481	. . . . .	{System diagnostic, e.g. monitoring battery voltage, detecting hardware detachments or identifying wireless transmission failures}	23/12	. .	operated by a running wheel
			23/14	. .	operated by the prime mover of the vehicle
			23/16	. .	Arrangements of air tanks mounted on vehicles (B60C 23/001 takes precedence)}
			23/18	. .	Tyre cooling arrangements {, e.g. heat shields (wheels with cooling fins B60B 19/10)}
			23/19	. .	for dissipating heat
			23/20	. .	Devices for measuring or signalling tyre temperature {only}
			25/00		Apparatus or tools adapted for mounting, removing, repairing or inspecting pneumatic or solid tyres (apparatus or tools for mounting or dismounting wheels B60B 29/00 ; apparatus or tools characterised by the means for holding wheels or parts thereof B60B 30/00)

25/002	. {Inspecting tyres}	25/059	. . . . {Conjoint tool operations, i.e. at least two tools cooperating simultaneously}
	NOTE	25/0593	. . . . {Multi-functional tools for performing at least two operations, e.g. bead breaking and bead seeking}
	When classifying in this group, classification is also made in the appropriate subgroups of B60C 25/0548	25/0596	. . . {Soaping devices}
25/005	. . {inside surface}	25/12	. . . for only seating the beads
25/007	. . {outside surface (measuring profile depth G01B 11/22)}		WARNING
25/01	. for manually removing tyres from or mounting tyres on wheels		Not complete pending reclassification; see also groups B60C 25/05 , B60C 25/145
25/015	. . {for only breaking the beads}	25/122	. . . . acting on the tyre tread
25/02	. . Tyre levers or the like, i.e. hand-held (machine operated B60C 25/05)		WARNING
25/025	. . . {with a jack}		Not complete pending reclassification; see also groups B60C 25/05 , B60C 25/145
25/04	. . . pivotal about the wheel axis, or movable along the rim edge, e.g. rollable	25/125	. . . for only breaking the beads
25/05	. . Machines, {i.e. motorized devices, e.g. for mounting, demounting (matching of tyres with rims, i.e. conjoint balancing G01M)}	25/128	. . . . acting axially on the whole circumference of the bead or sidewall
25/0503	. . . {for mounting only}	25/13	. . . . acting axially on a part of the bead or sidewall only at localised regions of the bead or side wall
25/0506	. . . {for demounting only}	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 })
25/0509	. . . {for inserting additional parts, e.g. support rings, sensors}	25/135	. . . . having a tyre support or a tool, movable along wheel axis
25/0512	. . . {Integrated systems performing multiple operations, e.g. assembly lines}	25/138	. . . . with rotary motion of tool or tyre support
25/0515	. . . {Automated devices, e.g. mounting robots}	25/14	. Apparatus or tools for spreading or locating tyre beads
25/0518	. . . {Horizontal wheel axis in working position}	25/142	. . {Devices for tightening or expanding the felly, devices for spreading the tyres}
25/0521	. . . {Handling of rim or tyre, e.g. lifting and positioning devices}	25/145	. . {for locating provisionally the beads of tubeless tyres against the sealing surfaces of the rims, e.g. air filling bell}
25/0524	. . . {Separating tyres from rims, e.g. by destroying}	25/147	. . {Safety cages for inflation}
25/0527	. . . {Adapting to different wheel diameters, i.e. distance between support and tool}	25/15	. . with means for inverting the tyre
25/053	. . . {Support of wheel parts during machine operation}	25/16	. {Tools for repairing damaged tyres}
25/0533	. . . . {Fixing the tyre only, e.g. gripping the tread portion for inserting the rim}	25/18	. Tools for mounting or demounting air valves
25/0536	. . . . {axially fixing the rim, e.g. pulling devices}	25/185	. . {Automated devices, e.g. robots}
25/0539	. . . . {radially fixing the rim, e.g. with gripping claws}	25/20	. Tools for attaching metallic tyres, e.g. iron tyres upon wooden rims
25/0542	. . . . {with self-centering means, e.g. cones}		
25/0545	. . . . {with rotary motion of tool or tyre support, e.g. turntables}	27/00	Non-skid devices temporarily attachable to resilient tyres or resiliently-tyred wheels {(vehicle mounted non-skid chains B60B 39/00)}
25/0548	. . . {equipped with sensing means, e.g. for positioning, measuring or controlling}	27/003	. {Mounting aids, e.g. auxiliary tensioning tools, slotted ramps}
25/0551	. . . . {mechanical}	27/006	. {provided with protective parts, e.g. rubber elements to protect the rim portion}
25/0554	. . . . {optical, e.g. cameras}	27/02	. extending over restricted arcuate parts of the circumference of the tread (B60C 27/20 takes precedence)
25/0557	. . . . {thermal}	27/0207	. . {involving lugs or rings taking up wear, e.g. chain links, chain connectors (chain couplings for, e.g. hoisting F16G 15/00)}
25/056	. . . . {measuring speed, acceleration or forces}	27/0215	. . . {Profiled links, e.g. cross-section other than round}
25/0563	. . . {Tools interacting with the tyre and moved in relation to the tyre during operation}	27/0223	. . . {Studded links, i.e. traction enhancing parts located on the link or inserted into the link}
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}		

27/023	. . {provided with radial arms for supporting the ground engaging parts on the wheel}	29/002	. {characterised by particular features of the valve core}
27/0238	. . {provided with tensioning means}	29/005	. {characterised by particular features of the valve stem}
27/0246	. . . {Resilient pretension}	29/007	. {for tyres with segmental sections or for multi-chamber tyres}
27/0253	. . . {Centrifugal forces for tensioning while driving}	29/02	. Connection to rims
27/0261	. . {provided with fastening means}	29/04	. Connection to tyres {or inner tubes}
27/0269	. . . {acting on the wheel, e.g. on the rim or wheel bolts}	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)}
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}	29/062	. . {for filling a tyre with particular materials, e.g. liquids (B60C 5/004, B60C 5/005 take precedence)}
27/0284	. . . {acting on the tread portion, e.g. special fixing agents, fastened in the groove of the tyre}	29/064	. . {Hose connections for pneumatic tyres, e.g. to spare wheels}
27/0292	. . . {acting on the sidewall of the tyre}	29/066	. . {Valve caps}
27/04	. . the ground-engaging part being rigid	29/068	. . {Pressure relief devices, i.e. safety devices for overpressure}
27/045	. . . {involving retractable devices (fixing of spade lugs B60B 15/00)}	99/00	Subject matter not provided for in other groups of this subclass
27/06	. extending over the complete circumference of the tread, e.g. made of chains {or cables} (B60C 27/20 takes precedence)	99/003	. {Tyre heating arrangements}
27/061	. . {provided with radial arms for supporting the ground engaging parts on the tread}	99/006	. {Computer aided tyre design or simulation}
27/062	. . {provided with fastening means}	2200/00	Tyres specially adapted for particular applications
27/063	. . . {acting on the wheel, e.g. on the rim or wheel bolts}	2200/02	. for aircrafts
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}	2200/04	. for road vehicles, e.g. passenger cars
27/065	. . . {acting on the tread portion, e.g. special fixing agents, fastened in the groove of the tyre}	2200/06	. for heavy duty vehicles
27/066	. . . {acting on the sidewall of the tyre}	2200/065	. . for construction vehicles
27/067	. . {Special chain layout, i.e. distribution of chain portions over the tread, e.g. arranged in polygon pattern}	2200/08	. for agricultural vehicles
27/068	. . {the ground-engaging part being rigid}	2200/10	. for motorcycles, scooters or the like
27/08	. . involving lugs or rings taking up wear, {, e.g. chain links, chain connectors (chain couplings for, e.g. hoisting F16G 15/00)}	2200/12	. for bicycles
27/083	. . . {Profiled links, i.e. cross-section other than round, e.g. hexagonal}	2200/14	. for off-road use
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)		