

PATENT SPECIFICATION

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(54) IMPROVEMENTS IN OR RELATING TO VEHICLE WHEELS

(71) We, DUNLOP HOLDINGS LIMITED, formerly The Dunlop Company Limited, a British Company of Dunlop House, Ryder Street, St. James's, London, S.W.1, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to vehicle wheels and to wheel and tyre assemblies.

When a pneumatic tyre is punctured, loss of air can occur to the extent that opposite interior walls of the tyre come into contact with high localised pressure caused by the vehicle load being transmitted through the radially outward edges of the radial flanges of the wheel rim.

Physical damage is caused to the tyre by the high localised pressure and considerable heat is generated by the rubbing action between the interior walls of the tyre, the coefficient of friction of dry rubber upon dry rubber being high. The damage and heat generation can rapidly cause tyre failure. Moreover, relative slippage between the tyre beads and the bead seats on the wheel rim can occur causing damage and further heat generation.

According to one aspect of the present invention there is provided a wheel having a rim with a pair of spaced-apart seats for the reception of tyre beads, annular, substantially axially-outwardly-extending rim portions of the wheel being provided one adjacent to each bead-seat defining faces against which the sidewalls of a tyre can be deflected and supported when the tyre is mounted on the rim and run in a deflated condition, each annular rim portion having on its sidewall supporting surface a coating of a low friction material.

The coating of a low friction material may be polytetrafluoroethylene. The coating of a low friction material reduces heat generation and abrasion when the lower sidewall regions of the tyre, which are of greater diameter than the annular rim por-

tions, are collapsed on said portions of the rim.

In addition, lower regions of the tyre sidewalls may be similarly coated with a low friction material and/or a low friction rubber compound may be used in the tyre sidewalls e.g. a rubber compound including a poly-butadiene or natural rubber.

Preferably the wheel comprises means for preventing a tyre mounted on the rim from being dislodged therefrom when the tyre is run deflated, for example, the rim may be provided with a portion between the bead seats which projects radially outwards thereof to form a saddle upon which the interior surface of the tread portion of a tyre can be supported upon tyre deflation. Additionally, or alternatively, to the saddle, the wheel may comprise a non-decreasing diameter of the rim between the bead seats so that the rim is without a well into which the tyre beads are able to fall. If desired the wheel rim may be provided with movable studs or projections which prevent at least one bead of a tyre mounted on the rim from moving away from its seat.

The wheel rim may, if desired, be formed initially with a well, the well being subsequently compressed by axial compression to form a "crimped" rim, or may be a rim which is divisible to permit a tyre to be mounted thereon.

The invention also provides a tyre and wheel assembly comprising a wheel according to the present invention and a tyre having a tread width greater than the overall width between the axial extremities of the wheel rim. The spacing of the bead seats, which governs the width of each individual axially-extending rim portion, is such as to provide a tyre bead-spacing resulting in a tyre having substantial stability against laterally-applied forces.

An example of the bead-seat spacing for a wheel of overall section width of 6 inches is 3.5 inches measured between the flanges of the wheel rim.

The present invention may be used in

[Price 25p]

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conjunction with our co-pending Patent Application Nos. 30033/70 (Serial No. 1,359,467), 30034/70 (Serial No. 1,359,468), 30027/70 (Serial No. 1,359,461), 30028/70 (Serial No. 1,359,462), 30030/70 (Serial No. 1,359,464) and 30031/70 (Serial No. 1,359,465).

The wheel of the invention may be used in a tyre and wheel assembly in which the tyre can be removed from the rim or alternatively in which the tyre is not removable from the rim and the two form a permanent assembly, for example, when the rim is swaged over the tyre beads after assembly of the tyre and rim.

A wheel rim in accordance with the invention will now be described, by way of example only, with reference to the accompanying drawing which shows the wheel rim schematically in section and a tyre mounted thereon.

The wheel rim consists of a substantially flat base 1 shown schematically in Figure 1 since the rim would preferably be split or have an axially compressed portion in order to facilitate mounting of the tyre. This is done in the case of an axially compressed rim by axially compressing and thus closing up a well in the rim after mounting the tyre thereon.

The rim base 1 is provided with flanges 2 and 3 which have axially outwardly extending annular portions 4 and 5 extending therefrom.

A tyre 6 is mounted on the rim with its beads 7 and 8 seated against the flanges 2 and 3 the width T—T of the tread of the tyre being greater than the overall width R—R of the wheel rim.

It should be noted that for a tyre with a given tread width the proportion of the width of the rim base 1 to the width of the annular rim portions 4 and 5 is chosen to retain satisfactory lateral stability of the tyre whilst providing a broad support surface for the collapsed sidewalls.

A low friction coating is provided on the radially outer surface of the annular portions 4 and 5.

WHAT WE CLAIM IS:—

1. A wheel having a rim with a pair of spaced apart seats for the reception of tyre beads, annular, substantially axially-outwardly-extending rim portions of the wheel being provided one adjacent to each bead seat defining faces against which the sidewalls of a tyre can be supported when the

tyre is mounted on the rim and run in a deflected condition, each annular rim portion having on its sidewall supporting surface a coating of a low friction material.

2. A wheel according to claim 1 in which the low friction material is polytetrafluoroethylene.

3. A wheel as claimed in any one of the preceding claims comprising means for preventing a tyre mounted on the rim from being dislodged therefrom when the tyre is run deflated.

4. A wheel according to claim 3 in which said means comprises a portion between the bead seats which projects radially outwards thereof to form a saddle upon which the interior surface of the tread portion of a tyre mounted on the rim can be supported upon deflation.

5. A wheel according to claim 3 or claim 4 in which said means comprises a non-decreasing diameter of the rim between the bead seats so that the rim has no well into which the tyre beads are able to fall.

6. A wheel according to claim 3 in which said means comprises movable studs or projections provided on the wheel rim to prevent at least one bead of a tyre mounted on the rim from moving away from its seat.

7. A wheel according to claim 5 in which the wheel rim is formed initially with a well, the well being subsequently compressed by axial compression.

8. A wheel according to claim 5 in which the wheel rim is divisible to permit a tyre to be mounted thereon.

9. A wheel substantially as described herein with reference to the accompanying drawing.

10. A tyre and wheel assembly comprising a wheel according to any one of the preceding claims and a tyre having a tread width greater than the overall width between the axial extremities of the wheel rim.

11. A tyre and wheel assembly according to claim 10 in which the lower regions of the tyre sidewalls are provided with a coating of a low friction material.

12. A wheel and tyre assembly according to claim 10 or claim 11 in which the tyre sidewalls include a low friction rubber compound.

13. A tyre and wheel assembly substantially as described herein with reference to, and as illustrated in, the accompanying drawing.

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Agent for the Applicants.



conjunction with our co-pending Patent Application Nos. 30033/70 (Serial No. 1,359,467), 30034/70 (Serial No. 1,359,468), 30027/70 (Serial No. 1,359,461), 30028/70 (Serial No. 1,359,462), 30030/70 (Serial No. 1,359,464) and 30031/70 (Serial No. 1,359,465).

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tyre is mounted on the rim and run in a deflected condition, each annular rim portion having on its sidewall supporting surface a coating of a low friction material.

2. A wheel according to claim 1 in which the low friction material is polytetrafluoroethylene.

3. A wheel as claimed in any one of the preceding claims comprising means for preventing a tyre mounted on the rim from being dislodged therefrom when the tyre is run deflated.

4. A wheel according to claim 3 in which said means comprises a portion between the bead seats which projects radially outwards thereof to form a saddle upon which the interior surface of the tread portion of a tyre mounted on the rim can be supported upon deflation.

5. A wheel according to claim 3 or claim 4 in which said means comprises a non-decreasing diameter of the rim between the bead seats so that the rim has no well into which the tyre beads are able to fall.

6. A wheel according to claim 3 in which said means comprises movable studs or projections provided on the wheel rim to prevent at least one bead of a tyre mounted on the rim from moving away from its seat.

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