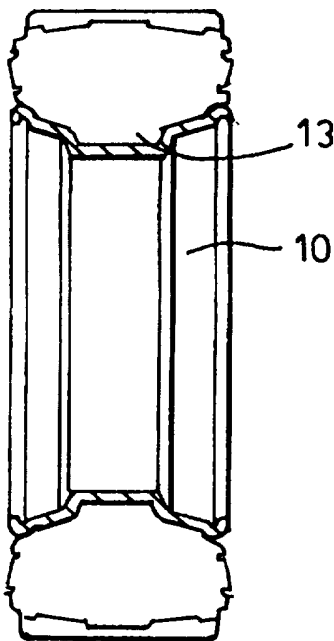




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<p>(21) International Application Number: PCT/GB96/02737</p> <p>(22) International Filing Date: 8 November 1996 (08.11.96)</p> <p>(30) Priority Data: 9523407.6 16 November 1995 (16.11.95) GB</p> <p>(71) Applicant (for all designated States except US): GRAM-MERCY LIMITED [GB/GB]; 5-11 Mortimer Street, London W1N 7RH (GB).</p> <p>(71)(72) Applicant and Inventor: FISHMAN, Jordan, Sidney [US/US]; 4015 Flamingo Avenue, Sarasota, FL 34242 (US).</p> <p>(74) Agents: McNEIGHT, David, Leslie et al.; McNeight & Lawrence, Regent House, Heaton Lane, Stockport, Cheshire SK4 1BS (GB).</p>		<p>(81) Designated States: AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, ARIPO patent (KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).</p> <p>Published <i>With international search report.</i></p>
<p>(54) Title: WHEEL</p> <p>(57) Abstract</p> <p>There is disclosed a tyre (11) and wheel assembly for a forklift truck or similar vehicle comprising a rim having an annular well (13) to enable fitting of a tubeless tyre (12) and a tyre having an aspect ratio 58 % or less.</p> <div style="text-align: right; margin-right: 100px;">  </div>		

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WHEEL

This invention concerns a wheel - by which is meant the combination of a rim and tyre - and more particularly, such wheel specifically for a forklift truck or similar vehicle.

Such vehicles ordinarily, in the interests of small size and manoeuvrability, have wheels of small diameter. Such vehicles also require brake drums of as large a diameter as possible, on account of their need to brake at frequent intervals, to ensure adequate stopping power, reasonable working life, and tolerable increases in brake temperature. The brake drums are ordinarily fitted within the rim inside diameter.

For these reasons, tyres having inner tubes on existing flat-base rims are normal, tubeless tyres requiring rims with deep annular wells (to enable fitting of the tyres) which necessarily reduce the diameter of brake drums which might otherwise be used.

Tyres with inner tubes and flaps are clearly more costly than tubeless tyres as are the multi-piece rims which carry them.

The present invention is based on an appreciation of the possibility of providing a heavy gauge wheel having a rim adapted to be fitted with a tubeless tyre and with the rim having an internal diameter comparable with or larger than that of a rim adapted to be fitted with a tyre of the kind having an inner tube by using a tyre of lower

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aspect ratio than has been used hitherto and at the same time maintaining the same outside diameter and width as a tube type tyre.

According to the invention there is provided a tyre and wheel assembly for a forklift truck or similar vehicle comprising a rim having an annular well to enable fitting of a tubeless tyre and a tyre having an aspect ratio of 58% or less.

A series of tyres with the following dimensions exemplify preferred assemblies:

OD ± 7%	TYRE WIDTH ±7%	RIM DIAMETER ± 10%
33.5"	9.0"	23.0" x 7.25
26.5"	10.0"	17.5" x 7.25
26.5"	8.0"	17.5" x 6.0
23.0"	7.5"	15.0 x 6.0
21.0"	6.5"	14.0 x 5.0
18.0"	5.5"	12.0 x 4.25

Whereas tyres having such low aspect ratios and special sizes would be quite unsuitable for many applications such as conventional highway truck tyres, they have advantage for the contemplated applications in providing for much greater stability for forklift trucks. Better braking because the use of larger brakes is possible. Also much higher carrying capacity.

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For the avoidance of confusion, we hereby confirm that the term “aspect ratio” as used herein is the ratio of the radial thickness to the width of the tyre.

The tyre must have the fabric of its cross plies extending up the inner face of the side walls of the tyre to cover at least 30% of the height of the side walls. This additional stiffness will increase the tyre’s stability.

The tyre should be inflated to a pressure of at least 125 p.s.i.

The invention will be further apparent from the following description, with reference to the figures of the accompanying drawing, which show, a conventional rim and tyre assembly and, by way of example only, one form of assembly embodying same.

Of the drawing:

Figure 1 shows a side view of a conventional assembly

Figure 2 shows a cross-section through the assembly on the line II-II of Figure 1;

Figure 3 shows a side view of an assembly embodying the invention; and

Figure 4 shows a cross-section through the assembly on the line IV-IV of Figure 3.

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Referring now to the drawing, it will be seen that both assemblies have the same overall diameter D, as specified, and wheel rims 10 of the same internal diameter d.

On the conventional assembly, the tyre 11 has an inner tube and is seated on a rim of substantially constant diameter across its width.

On the assembly embodying the invention, the tyre 12 is tubeless and is seated on a rim having a central annular well 13 to enable fitting of the tyre.

The similarity of the dimensions D and d (or larger) on the two assemblies is possible because the assembly embodying the invention has a tyre of relatively small aspect ratio of 58% or less as exemplified by the following preferred possibilities:-

OD ± 7%	TYRE WIDTH ±7%	RIM DIAMETER ± 10%
33.5"	9.0"	23.0" x 7.25
26.5"	10.0"	17.5" x 7.25
26.5"	8.0"	17.5" x 6.0
23.0"	7.5"	15.0 x 6.0
21.0"	6.5"	14.0 x 5.0
18.0"	5.5"	12.0 x 4.25

The tyre 12 has the fabric of its cross plies extending up the inner face of the side walls of the tyre to cover at least 30% of the height thereof.

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The tyre 12 is intended to be inflated to a pressure of at least 125 p.s.i.

It will be appreciated that it is not intended to limit the invention to the above example only, many variations, such as might readily occur to one skilled in the art, being possible, without departing from the scope thereof.

CLAIMS

1. A tyre and wheel assembly for a forklift truck or similar vehicle comprising a rim having an annular well to enable fitting of a tubeless tyre and a tyre having an aspect ratio of 58% or less.
2. An assembly according to claim 1 wherein the tyre has the fabric of its cross plies extending up the inner face of the side walls of the tyre to cover at least 30% of the height of the side walls.
3. An assembly according to claim 1 or claim 2 wherein the tyre is inflated to a pressure of at least 125 p.s.i.

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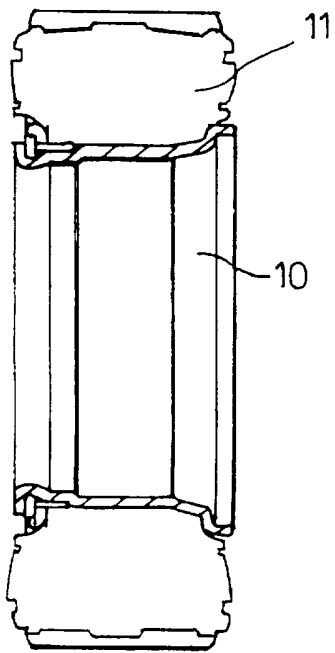


FIG. 2

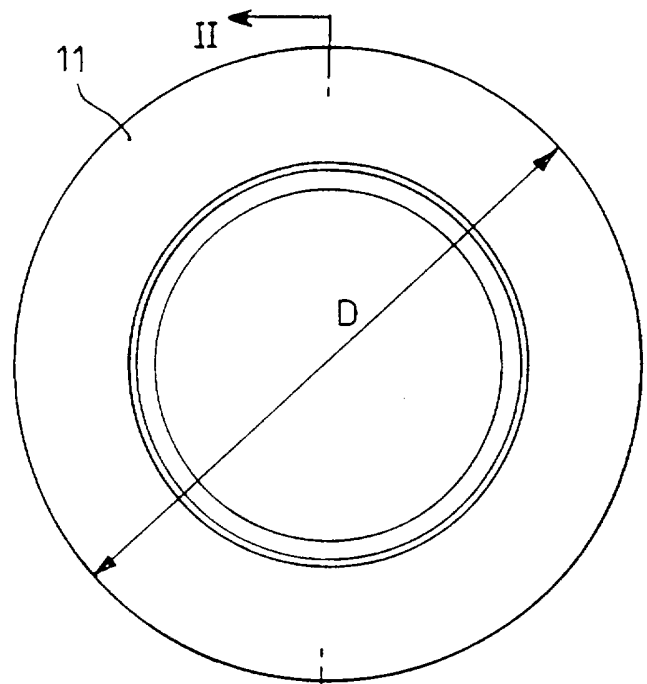


FIG. 1

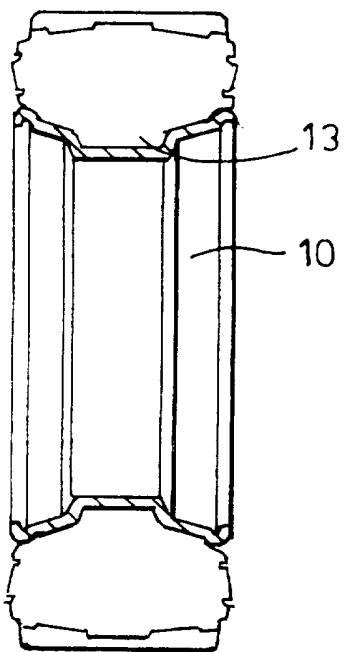


FIG. 4

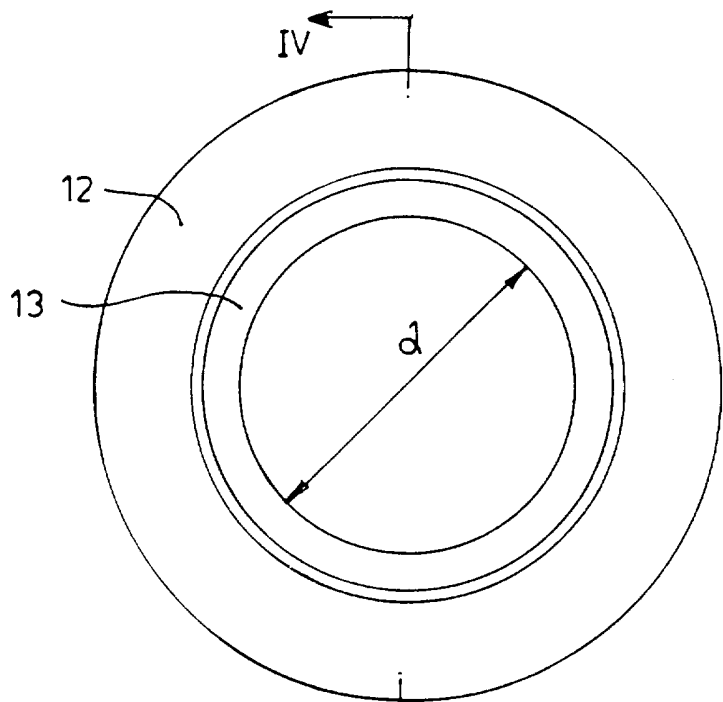


FIG. 3

INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 96/02737

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 B60B21/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 B60B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FR 2 610 872 A (PNEU ROYAL ENGLEBERT) 19 August 1988	1
A	see page 7, line 34 - page 13, line 13; figures	2
A	--- DE 556 582 C (MAX HERING) 12 August 1932 see the whole document	1
A	--- FR 2 154 790 A (DUNLOP) 11 May 1973 see page 3, line 24 - page 8, line 12; figures	1

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Date of the actual completion of the international search	Date of mailing of the international search report
17 February 1997	28.02.97
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+ 31-70) 340-2040, Tx. 31 651 epo nl, Fax (+ 31-70) 340-3016	Authorized officer Vanneste, M

INTERNATIONAL SEARCH REPORT

Information on patent family members

Int. Application No PCT/GB 96/02737

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
FR-A-2610872	19-08-88	DE-A- 3704798 GB-A,B 2202195	25-08-88 21-09-88

DE-C-556582		NONE	

FR-A-2154790	11-05-73	GB-A- 1410914 CA-A- 982630 DE-A- 2248227 AU-A- 4730772	22-10-75 27-01-76 26-04-73 26-04-74
