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(71) Applicant: **ALPINA RAGGI S.P.A.** [IT/IT]; Via Piave,  
10, 23871 LOMAGNA (LC) (IT).

(72) Inventor: **CAPPELLOTTO, Guido**; Via C. Battisti, 60,  
20043 ARCORE (MI) (IT).

(74) Agent: **CANTALUPPI, Stefano** et al.; Piazzetta Cappella-  
to Pedrocchi, 18, 35122 Padova (IT).

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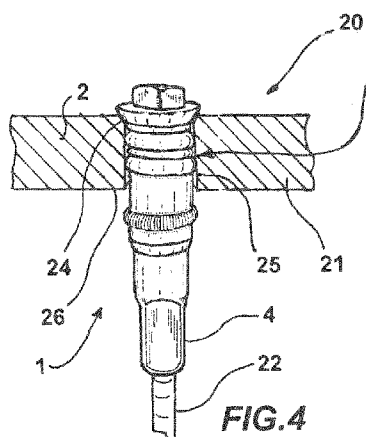
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— *of inventorship (Rule 4.17(iv))*

**Published:**

— *with international search report (Art. 21(3))*

(54) Title: NIPPLE FOR SPOKED WHEELS OF THE TUBELESS TYPE



(57) Abstract: A nipple for spoked wheels of the tubeless type comprises a first and a second shoulder which are formed on a rod with a blind axial hole which is internally threaded at an end of the rod which is distal from the opening of the axial hole and in a zone of the rod which is proximal with respect to the opening, respectively. A first recess for a sealing ring is formed on the rod behind the first shoulder and at least a second recess for a second sealing ring is formed on the rod between the first recess and the second shoulder.



**Nipple for spoked wheels of the tubeless type**

## DESCRIPTION

The invention relates to a nipple for spoked wheels of the type including the features set out in the preamble of the main claim.

5 A nipple provided with those features is known from current production of the same Applicant and from EP1926606.

This nipple produces an optimum coupling between the spokes and the rim in the spoked wheels which are mounted without an air chamber (tubeless), in particular in wheels for both on-road and off-road competition motorcycles. These  
10 wheels have a problem of continuous resilient deformations resulting from the high loads to which they are subjected. Similar deformations are transmitted with stress peaks in the rim-spoke/nipple assembly producing with a given frequency breakages of the spoke as a result of mechanical fatigue.

The solution set out by EP1926606 involves producing a mechanical  
15 connection which can slide between the rim and nipple so that the nipple can move in its seat of the rim with an alternating movement of the cylinder/piston type when the spoke is loaded in a point-like manner.

However, it has been found that this connection can cause disadvantages as a result of both the damage to the sealing O-ring and to the dragging of dust and  
20 dirt which in the end compromises the pneumatic fluid-tightness of the mounted wheel. Furthermore, when the means are washed after a competition or after normal use, perhaps using high-pressure washing lances, they can result in problems of ductility between the nipple and the relative highly undesirable fluid-tightness levels.

25 Other documents which represent the prior art are EP2094509 and EP2403721.

The problem addressed by the present invention is to provide a nipple for spoked wheels which is structurally and functionally configured to eliminate all the

technical disadvantages set out with reference to the cited prior art.

This problem is solved by the invention by means of a nipple which is constructed according to the appended claims.

The characteristics and advantages of the invention will be better appreciated from the following detailed description of a preferred but non-limiting embodiment thereof which is illustrated by way of non-limiting example with reference to the appended drawings, in which:

- Figure 1 is a perspective view of a nipple which is produced according to the present invention;
- Figure 2 is a perspective view of the rod of the nipple of Figure 1;
- Figure 3 is an axial section of the rod of Figure 2;
- Figure 4 is a partial cross-section of a spoked wheel with the nipple of this invention.

In the Figures, there is generally designated 1 a nipple which is produced according to the present invention.

The nipple 1 comprises a rod 2 which is substantially cylindrical, which has an axis X with an axial blind hole 3 which is internally threaded.

The hole 3 has an opening 4 which is open at an axial end of the rod 2 and which extends in the rod over an extent which is less than the total length thereof.

A first manoeuvring key 16 is formed on the rod 2 from the opening 4; this manoeuvring key has a polygonal, preferably square, cross-section.

A first cylindrical portion 5 extends between the manoeuvring key 4 and a second cylindrical portion 6 of the rod 2, the second cylindrical portion 6 having a greater diameter with respect to the diameter of the first portion 4.

The cylindrical portion 6 terminates in a head 7 of the nipple which has a first shoulder 8 which is rounded in the manner of a spherical ball sector which faces the cylindrical portion 6 and a second manoeuvring key 9 having a polygonal outline, which is used to grip and rotate the nipple from the outer side of the wheel rim.

Along the cylindrical portion 6 there are formed three recesses 10, 11, 12, the first two (11, 12) one behind the other and the shoulder 8, while the third (10) is formed in a substantially central position along the axis of the rod, in a distal relationship with respect to the first shoulder 8.

5       The first two recesses are provided with a U-shaped groove in order to receive respective sealing rings 14, 15 having O-rings. The third recess 12 is provided with a semi-rounded groove in order to receive a resilient ring 13 of the type with a helical spring which acts as a second shoulder of the nipple 1.

10       In order to construct a wheel 20 using a rim 21 and spokes 22, the nipples 1 are positioned in respective seats 23 of the rim 21 so as to converge towards the wheel centre with the first manoeuvring key 4.

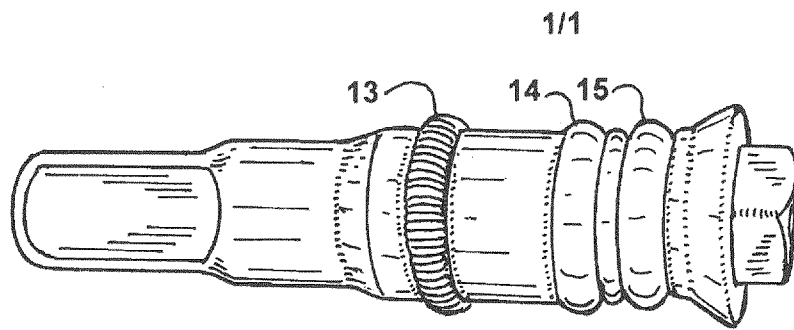
15       Each seat 23 has a cup-like end 24 with a circular sphere sector, which conforms to the shoulder 8, and a cylindrical portion 25 which terminates in a surface 26. The nipple is inserted in the seat 23 until the shoulder 8 is received in the cup-like end 24. Under those conditions, the third recess 12 projects beyond the surface 26 so as to allow axial play of the nipple 1 in the respective seat 23. This axial play is limited by the shoulder 8 with the cup-like end 24 and, at the opposite side, by the shoulder formed by the resilient ring 13 with the surface 26.

20       The axial movement of the nipple 1 in the seat 23 is such that those shoulders limit the extent thereof in such a manner that in any case both the sealing rings 14, 15 remain bonded with the cylindrical internal surface 25 of the seat 23.

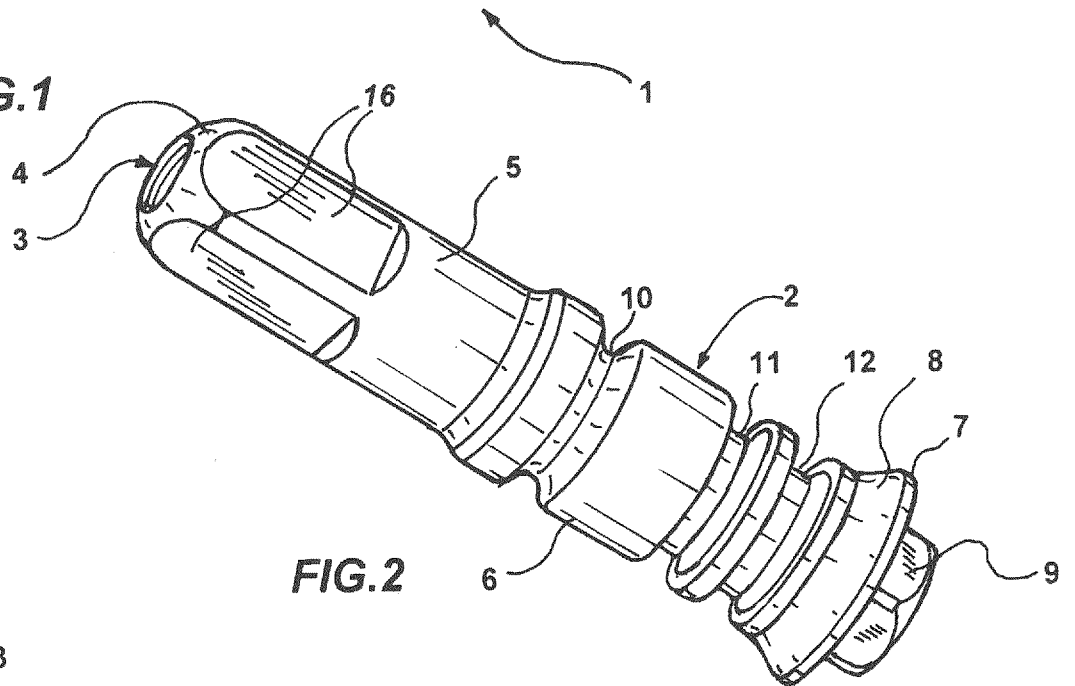
25       The invention thereby solves the problem set out and achieves a number of advantages, including the combination of a suitable structure for providing optimum resistance to fatigue combined with pneumatic strength which is improved in any circumstances.

**CLAIMS**

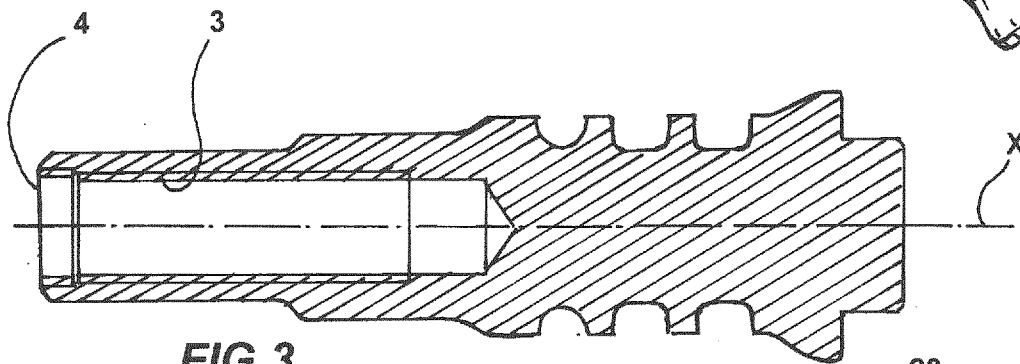
1. A nipple for spoked wheels of the tubeless type including a rod (2) with an axial  
blind hole (3) which is internally threaded, a first and a second shoulder (8, 13)  
5 which are formed on the rod at an end of the rod which is distal from the opening  
of the axial hole (3) and in a zone of the rod which is proximal with respect to the  
opening, respectively, and a recess (12) for a sealing ring (15) on the rod  
substantially behind the first shoulder (8), characterized in that it comprises at  
least a second recess (11) for a second sealing ring (14) on the rod between the  
10 first recess (12) and the second shoulder (13).
2. A nipple for spoked wheels according to claim 1, wherein the at least one second  
recess (11) is formed behind the first recess (12).
- 15 3. A nipple for spoked wheels according to claim 1 or claim 2, wherein the sealing  
rings (14, 15) are of the type having an O-ring.
4. A nipple for spoked wheels according to claim 1, 2 or 3, wherein the second  
shoulder comprises a third recess (10) in which a resilient ring (13) is received.  
20
5. A nipple for spoked wheels according to claim 4, wherein the resilient ring (13) is  
of the type with a helical spring.
6. A nipple for spoked wheels according to one or more of the preceding claims,  
25 wherein the third recess (10) is in a substantially central position along the axis of  
the rod (2).



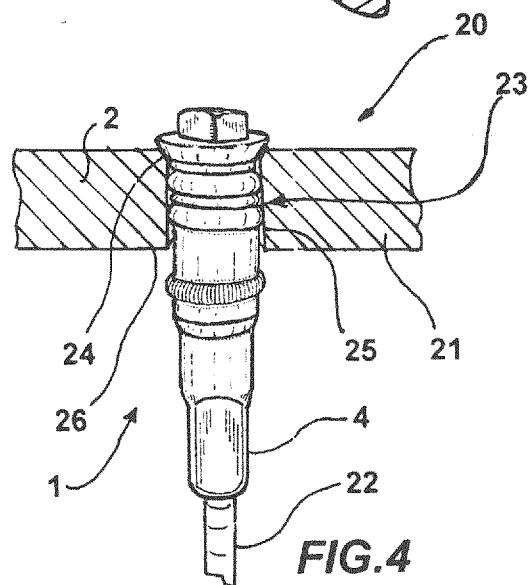
**FIG.1**



**FIG.2**



**FIG.3**



**FIG.4**

# INTERNATIONAL SEARCH REPORT

International application No  
PCT/EP2017/065299

A. CLASSIFICATION OF SUBJECT MATTER  
INV. B60B1/04 B60B21/06  
ADD.

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)  
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 practicable, search terms used)

EPO-Internal, WPI Data

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 1 926 606 A1 (ALPINA RAGGI SPA [IT]) 4 June 2008 (2008-06-04) cited in the application paragraphs [0002] - [0004], [0008] - [0016]; claims 4, 5; figures 1, 2 -----	1-6
A	EP 2 094 509 A1 (ALPINA RAGGI SPA [IT]) 2 September 2009 (2009-09-02) paragraphs [0011] - [0019]; figures 1-3 -----	1-6
A	EP 2 403 721 A1 (RUOTEMILANO S R L [IT]) 11 January 2012 (2012-01-11) paragraphs [0017] - [0021]; figure 7 -----	1-6



Further documents are listed in the continuation of Box C.



See patent family annex.

\* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

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Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040,  
Fax: (+31-70) 340-3016

Authorized officer

Schreck, Mathias

# INTERNATIONAL SEARCH REPORT

Information on patent family members

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