



US009409448B2

(12) **United States Patent**
Yoshikawa

(10) **Patent No.:** **US 9,409,448 B2**

(45) **Date of Patent:** **Aug. 9, 2016**

(54) **PNEUMATIC TIRE**

2007/0000585 A1 1/2007 Uchida et al.
2008/0308203 A1 12/2008 Kunisawa et al.
2013/0092300 A1 4/2013 Kunisawa et al.

(71) Applicant: **TOYO TIRE & RUBBER CO., LTD.**,
Osaka-shi, Osaka (JP)

FOREIGN PATENT DOCUMENTS

(72) Inventor: **Makoto Yoshikawa**, Osaka (JP)

EP 2487052 * 8/2012
JP 10-6414 * 1/1998
JP 10-006414 A 1/1998
JP 10-193926 * 7/1998
JP 3615872 * 2/2005
JP 3681246 * 8/2005

(73) Assignee: **TOYO TIRE & RUBBER CO., LTD.**,
Osaka (JP)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 330 days.

(Continued)

(21) Appl. No.: **14/061,997**

OTHER PUBLICATIONS

(22) Filed: **Oct. 24, 2013**

Office Action dated Apr. 23, 2015, issued in counterpart German Patent Application No. 10 2013 113 935.3 with English translation (9 pages).

(65) **Prior Publication Data**

US 2014/0174612 A1 Jun. 26, 2014

(30) **Foreign Application Priority Data**

Primary Examiner — Justin Fischer

Dec. 25, 2012 (JP) 2012-281309

(74) *Attorney, Agent, or Firm* — Westerman, Hattori, Daniels & Adrian, LLP

(51) **Int. Cl.**

B60C 1/00 (2006.01)
B60C 19/08 (2006.01)
B60C 9/00 (2006.01)

(57) **ABSTRACT**

(52) **U.S. Cl.**

CPC **B60C 19/084** (2013.04); **B60C 19/082** (2013.04); **B60C 1/00** (2013.01); **B60C 9/00** (2013.01)

A pneumatic tire has a carcass ply and a side wall rubber provided in outer sides of the carcass ply. The carcass ply has joint portions obtained by overlapping end portions of ply members so as to join. At least one of the joint portions is provided with a rubber tape. The rubber tape is interposed between the end portions of the ply members and is exposed to a surface of the carcass ply. A topping rubber of the carcass ply and the side wall rubber are formed by a nonconductive rubber. The rubber tape is formed by a conductive rubber. A conductive route getting to the rubber tape from a ground-contacting surface is formed in a tread portion. A conductive route getting to the rubber tape from an outer surface of a bead portion is formed in the bead portion.

(58) **Field of Classification Search**

CPC B60C 1/00; B60C 9/00; B60C 19/00; B60C 19/08; B60C 19/082; B60C 19/084
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,240,250 A * 3/1966 Frazier B29D 30/34
152/560

2006/0102264 A1 5/2006 Nicolas

6 Claims, 5 Drawing Sheets

