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**Datasheet for the decision  
of 7 March 2019**

**Case Number:** T 0375/16 - 3.2.01

**Application Number:** 09175902.7

**Publication Number:** 2186658

**IPC:** B60C23/04

**Language of the proceedings:** EN

**Title of invention:**

Tire and electronic device assembly and method of embedding an electronic device in a tire

**Patent Proprietor:**

The Goodyear Tire & Rubber Company

**Opponents:**

MICHELIN Recherche et Technique S.A.  
Bridgestone Americas Tire Operations, LLC

**Headword:**

**Relevant legal provisions:**

EPC Art. 56, 84  
RPBA Art. 13(1)

**Keyword:**

Inventive step - main request, auxiliary requests 1 to 3 (no)  
Claims - clarity - auxiliary request 4 (no)  
Admissibility - late-filed auxiliary request 5 (no)

**Decisions cited:**

G 0003/14

**Catchword:**



**Beschwerdekammern**

**Boards of Appeal**

**Chambres de recours**

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Case Number: T 0375/16 - 3.2.01

**D E C I S I O N**  
**of Technical Board of Appeal 3.2.01**  
**of 7 March 2019**

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**Decision under appeal:** **Interlocutory decision of the Opposition**  
**Division of the European Patent Office posted on**

14 December 2015 concerning maintenance of the  
European Patent No. 2186658 in amended form.

**Composition of the Board:**

<b>Chairman</b>	G. Pricolo
<b>Members:</b>	J. J. de Acha González
	S. Fernández de Córdoba

## Summary of Facts and Submissions

I. The appeals of the proprietor and the opponents are directed against the interlocutory decision of the Opposition Division concerning the maintenance of the European Patent in amended form on the basis of the auxiliary request 3 as filed during the oral proceedings before the Opposition Division.

II. In the contested decision the following documents are inter alia cited:

E1: King, Patrick, "Exposé du Dr. Patrick King, le 27 octobre 2005",

E2: Magazine Le Pneumatique,

"Puce électronique dans les pneus

La 1<sup>ère</sup> manche à Goodyear", Vol. 92, 6/2007,

D4a: US 2008/0289736 A1, and

D14: US 2006/0038665 A1.

III. Oral proceedings were held before the Board on 7 March 2019.

The appellant (patent proprietor) requested that the decision under appeal be set aside and that the patent be maintained in amended form on the basis of the main request or, in the alternative, according to any of the auxiliary requests 1 or 2 (as filed with the statement of grounds of appeal), or that the appeals of the opponents be dismissed (i.e. maintenance of the patent according to auxiliary request 3), or that the patent be maintained in amended form according to any of the auxiliary requests 4 or 5 (as filed during the oral proceedings).

The appellants (opponents 1 and 2) requested that the decision under appeal be set aside and that the European patent be revoked.

IV. Claim 1 of the main request reads as follows:

"1. A tire and electronic device assembly; the tire (28) having a pair of beads (30), at least one ply layer (44) having a plurality of parallel cords (46) extending from one bead (30) to an opposite bead (30), the at least one ply layer (34, 44) further having a ply ending (48) wrapped around one bead (30), a sidewall (38), an apex component (32) positioned above the one bead (30) and extending upward to an apex component end (33), and a chafer component (50) wrapped around the one bead (30) and extending upward to a chafer component end (52); the assembly (10) comprising an electronic device (12) including a transponder tag, a dipole antenna formed by first and second elongate antenna segments (18, 20) electrically coupled at inward ends to the transponder tag and extending in opposite respective directions from the transponder tag, and a compound (24) having compatible permittivity and conductivity with operation of the dipole antenna, the transponder device (12) and at least a portion of the dipole antenna being at least partially embedded within the compound (24); wherein the transponder tag is operably mounted to the tire (28) in an orientation placing a longitudinal axis of the dipole antenna perpendicular or substantially perpendicular to the parallel cords (46), wherein the transponder tag is operably mounted to the tire (28) in a position

(i) between the apex component (32) and the sidewall (38) and radially between the chafer component end (52) and the apex component end (33) at a distance of at

least 5 mm from the chafer component end (52) and radially inward of the ply ending, or

- (ii) radially above the ply ending (48) and radially above the apex component end (33) at a distance in a range of from 10 mm to 40 mm from the apex component end (33)."

Claim 1 of the first auxiliary request differs from claim 1 of the main request in that the wording "at least one ply layer" is replaced by "one ply layer".

Claim 1 of the second auxiliary request is identical to claim 1 of the first auxiliary request.

Claim 1 of the third auxiliary request differs from claim 1 of the main request in that it is solely directed to the alternative (ii), the alternative (i) being deleted. This request corresponds to the version maintained by the Opposition Division in its decision.

Claim 1 of the fourth auxiliary request differs from claim 1 of the main request in that it is solely directed to the alternative (i), the alternative (ii) being deleted.

Claim 1 of the fifth auxiliary request differs from claim 1 of the fourth auxiliary request in that the wording "radially inward of the ply ending" is replaced by "radially inward of the edge of the ply ending".

- V. The appellant's (patent proprietor) submissions relevant to the decision can be summarised as follows:

The subject-matter of claim 1 of the version maintained by the Opposition Division, which corresponds to the

alternative (ii) of claim 1 of the main request and the first and second auxiliary requests, involves an inventive step when starting from E1 as the closest prior art and in view of common general knowledge of the skilled person. Specifically, E1 does not disclose the following features:

- (a) the transponder device and at least a portion of the dipole antenna being at least partially embedded within the compound having compatible permittivity and conductivity with operation of the dipole antenna; and
- (b) the transponder tag is operably mounted to the tire in a position at a distance in a range of from 10 mm to 40 mm from the apex component end.

These features provide a synergetic effect to solve the technical problem of providing a tire having an electronic tag integrated in a manner that does not degrade tire performance and durability, provides suitable reading capability of the tag and is capable of efficient incorporation into the tire manufacturing process.

Claim 1 of the fourth auxiliary request is prevented from a clarity examination in line with the decision of the Enlarged Board of Appeal G 3/14. The terms "ply ending" and "radially above the ply ending" are present in claim 1 as granted and, accordingly, the added wording "radially inward the ply ending" cannot introduce a non-compliance with Article 84 EPC. In this respect, the ply ending can only be seen as the ply end line.

Finally, the Board should admit the fifth auxiliary request because it specifically addresses the Article 84 EPC objection of claim 1 of the fourth auxiliary request and it does not raise any further issues. The



wording of the added feature to claim 1 - "the edge of the ply ending" - is found in paragraph [0031] of the patent and the claimed location, radially inward of that edge, is clearly shown in figures 7B and 9B of the patent.

VI. The appellants (opponents 1 and 2) counter argued essentially as follows:

The subject-matter of claim 1 as maintained by the Opposition Division in its decision does not involve an inventive step in view of E1 and common general knowledge. Opponent 1 defends that E1 implicitly discloses also features (a) and (b).

Further, these features do not provide a synergetic effect but only an aggregation of their individual effects. The technical problem posed by the differences can be formulated as how to put into practice the tire shown in E1. In this regard, embedding an RFID tag within a compound in order to integrate it into a rubber tire is known to the skilled person as acknowledged by D4a (see paragraphs [0030] to [0034]), E2 (see pages 42 and 45) and by the patent proprietor himself (see his reply dated 9 September 2016; paragraph 4 on page 12).

As for feature (b) the patent specification is silent on any technical effect associated to it. The specific distance to the apex component end cannot thus contribute to inventive step. Further, the claimed absolute value of the distance is meaningless without any relation to dimensions of the other elements of the tire. The skilled person when putting into practice the tire as shown in E1 in a specific tire with determined dimensions and in order to reach a reasonable compromise among tire performance and durability, reading capability of the tag and integration in the

manufacturing process of the tire would inevitably at some point fall in the claimed range.

Claim 1 of the fourth auxiliary request is not clear. The added feature "radially inward of the ply ending" generates a contradiction with the other features of claim 1 defining the position of the transponder tag within the tire and thus is open to a clarity examination. The tag cannot be located between the apex component and the sidewall, radially between the chafer component end and the apex component end, and simultaneously radially inward of the ply ending. In this regard, it is clear for the skilled person from the whole patent specification that the ply ending can only be the portion of the ply that wraps around the bead and not only its end line or edge. Opponent 2 further requests not to admit this request filed at such a late stage of the appeal proceedings pursuant to Article 13(1) and (3) of the Rules of Procedure of the Boards of Appeal (see OJ EPO 2007, 536; in the following referred to as RPBA). An adjournment is also conditionally requested in case the Board would admit the request into the appeal proceedings.

The Board should exercise its discretion not to admit the late filed fifth auxiliary request. The issue regarding the definition of the ply ending was discussed during the opposition proceedings and was the subject of the appeal proceedings since the beginning. The proprietor however never filed a request addressing the clarity objection deriving from the interpretation of the term and nothing has changed in this respect that would justify the admission of the request. The alleged reason of overcoming the clarity issue from claim 1 of the fourth auxiliary request is thus not

sufficient. Furthermore, the request raises new points of discussion, among them, an issue of intermediate generalisation (Article 123(2) EPC) since the basis for the amendment is figures 7B and 9B which relate to the disclosure of a specific embodiment of the invention.

### **Reasons for the Decision**

1. The subject-matter of claim 1 as maintained by the Opposition Division in the contested decision, i.e. in accordance with the third auxiliary request of the patent proprietor in appeal proceedings, does not involve an inventive step in view of E1 in combination with common general knowledge (Article 56 EPC).
- 1.1 This subject-matter corresponds to the alternative (ii) of the subject-matter of claim 1 of the main request and the first and second auxiliary requests. As a consequence, as accepted by the appellant (patent proprietor) during the oral proceedings before the Board, the finding of lack of inventive step in respect of the subject-matter of claim 1 according to third auxiliary request also applies to claim 1 of these higher ranking requests.
- 1.2 In line with the Opposition Division in its decision, the differences between the subject-matter of claim 1 as maintained and the tire and electronic device assembly of E1 (see slide 8, left figure) are:
  - (a) the transponder device and at least a portion of the dipole antenna being at least partially embedded within the compound having compatible

permittivity and conductivity with operation of the dipole antenna; and

- (b) the transponder tag is operably mounted to the tire in a position at a distance in a range of from 10 mm to 40 mm from the apex component end.

This was not disputed by the appellant (patent proprietor) nor by opponent 2.

- 1.3 The proprietor alleges that features (a) and (b) provide a synergetic effect for solving the problem of providing a tire having a transponder embedded in which the durability of the tire is not degraded, readability of the transponder is suitable, and incorporation into the manufacturing process is efficient. This problem amounts to finding a position for the transponder tag which provides a compromise among the aforementioned durability, readability and manufacturing (see paragraph [0028] of the contested patent). The prior art does teach the features of this solution in combination, but only in an isolated manner. For instance, D4a discloses feature (a) and D14 different locations for the transponder in the side wall of the tire. However, the question at hand is whether the skilled person would arrive to the solution and not if he could. No guidance is found in the state of the art which would prompt the skilled person to the claimed solution.

- 1.4 The Board however concurs with the opponents in that the combination of features (a) and (b) of claim 1 represents an aggregation of features which does not provide any synergetic technical effect. According to the patent specification the compound in which the transponder device is embedded is not disclosed in relation to its positioning within the tire (see

paragraph [0023] and [0024] of the patent) and no combined technical effect associated to the compound and the specific claimed position of the transponder is identified. The compound must simply be such as not to interfere with the antenna performance and to provide a suitable integration of the rigid electronic device to the tire rubber neighbouring components.

Further, the specification does not disclose any particular technical effect associated with the specific claimed location of the tag in a range of from 10 mm to 40 mm from the apex component end. The specification generally explains that the position of the transponder tag within the tire has to be chosen in order to meet a compromise between good readability of the tag and tire durability and stability together with tag protection (see paragraphs [0027] to [0031] of the patent specification). The only embodiment where the tag is above the apex component end is the one of figures 7A and 9A, and according to the description (see paragraph [0028]) this position is advantageous in achieving a good reading but disadvantageous to tire and tag durability.

- 1.4.1 The proprietor admits that embedding a transponder tag and an antenna in a rubber composition for tire integration (feature (a)) is as such known already for quite some time for the skilled person and evidenced by D4a (see also E2, pages 42 and 45, as pointed out by the opponents).

Therefore, embedding the transponder tag of E1 in such a compound for its integration in the rubber of a tire is obvious to the skilled person.

- 1.4.2 Regarding feature (b), E1 does not specify any measures and distances for the different components of the tire assembly. As mentioned above, according to the patent

specification the specific selection of a distance from a range between 10 mm to 40 mm from the apex component end is not explained as purposive (no additional technical effect related to it). This distance is expressed in absolute terms in claim 1 but the claim leaves open other dimensions of the tire and its components. The tire of claim 1 could be a passenger car tire, a tractor tire, aircraft tire or any other kind of tire with completely different dimensions. The claimed range for the position thus amounts merely to a location within the tire sidewall which the skilled person would consider when putting into practice the tire of E1 in a specific application and bearing in mind the above mentioned compromise. Feature (b) cannot thus justify an inventive step.

- 1.5 The contested decision is therefore to be set aside.
2. Claim 1 of auxiliary request 4 is not clear (Article 84 EPC).
  - 2.1 Claim 1 differs from claim 1 as granted in that it is only limited to the alternative (i), the alternatives (ii) and (iii) being deleted, and further including the following feature for the location of the tag within the tire:

"and radially inward of the ply ending".

In dispute is whether the added wording is open to a clarity analysis and whether it brings an unclarity into claim 1 or not.
  - 2.2 According to the decision of the Enlarge Board of Appeal G 3/14 (see Official Journal of the EPO 2015, 102) in considering whether, for the purposes of Article 101(3) EPC, a patent as amended meets the

requirements of the EPC, the claims of the patent may be examined for compliance with the requirements of Article 84 EPC only when, and then only to the extent that the amendment introduces non-compliance with Article 84 EPC.

- 2.2.1 The appellant (patent proprietor) alleges that the added feature does not introduce a non-compliance with Article 84 EPC and is therefore not open to a clarity examination. The wordings "ply ending" and "radially above the ply ending" were already present in claim 1 as granted, so that the added wording "radially inward of the ply ending" cannot introduce an unclarity which was not present already in claim 1 as granted. In his argument, the appellant (patent proprietor) construes the claimed ply ending as being the ply end line along the tire circumference. No other technical meaningful interpretation of the term is possible.

However and in line with the opponents, it is clear to the skilled person from the patent specification (see paragraphs [0007], [0026], [0029] and [0031], in combination with figures 7A to 9B and claim 1) that the ply ending is defined as the end portion of the ply that wraps around the bead 30 and not solely as the ply end line or edge, unlike the chafer ending/end 52 and the apex ending/end 33. The ply end line in the figures of the patent is not wrapped around the bead and consequently cannot correspond to the claimed ply ending. In contrast, the end portion of the ply 34 (see figure 9A) folds and curves around the bead 30. This meaning is further confirmed with the specific reference to the edge of the ply ending in paragraph [0031] of the patent.

Accordingly, the terms "ply ending" and "radially inward of the ply ending" of claim 1 are as such clear to the skilled person, the ply ending representing the end portion of the ply wrapped around the bead.

Yet the inclusion of the feature "radially inward of the ply ending" does bring along an unclarity within claim 1 which was not present in claim 1 as granted. Indeed, a contradiction has been introduced into the claim in the sense that all conditions for the location of the transponder tag within the tire defined in claim 1 cannot be fulfilled. On the one hand the tag is mounted in a position between the apex component and the sidewall and radially between the chafer component end and the apex component end and, on the other hand, radially inward of the ply ending. These two conditions are mutually exclusive (see figures 7A to 9B of the patent) and as a result the position of the tag is not clearly defined in the claim (Article 84 EPC).

- 2.3 As a consequence, claim 1 according to the fourth auxiliary request is open to an examination of clarity, which leads to the finding that it does not meet the requirements of Article 84 EPC.
- 2.4 The Board admitted the fourth auxiliary request in the proceedings essentially because claim 1 thereof is a limitation of claim 1 of the main request to alternative (i) and because it had to be expected that this alternative could form the subject of discussions during the oral proceedings. There is no need, however, to give further details here as this request anyway falls for lack of compliance with Article 84 EPC.
3. The fifth auxiliary request is not admitted in the appeal proceedings pursuant to Article 13(1) RPBA.



- 3.1 The patent proprietor argued that the amendment introduced in claim 1 of this request addressed the different interpretation of the ply ending which resulted in the lack of clarity of claim 1 of the fourth auxiliary request. Specifying that the location is radially inward of the edge of the ply ending overcomes the contradiction in the claim and reflects what the proprietor always meant.
- 3.2 According to Article 13(1) of the RPBA, any amendment to a party's case after it has filed its grounds of appeal or reply may be admitted and considered at the Board's discretion. The discretion shall be exercised in view of inter alia the complexity of the new subject-matter submitted, the current state of the proceedings and the need for procedural economy.
- 3.3 In the case at hand, the issue of interpretation of the term "ply ending" was part of the contested decision (see page 8, point 2.1.c), of the statement of grounds of appeal of the proprietor, of the reply of the opponent 2 from 12 September 2016 (see point 2), as well as of the communication of the Board pursuant to Article 15(1) RPBA (see point 2.1). However, the proprietor chose not to file any requests addressing the conflicting issue at any stage of the appeal proceedings up to the oral proceedings and after the discussion on Article 84 EPC for the fourth auxiliary request took place.
- Additionally, the amendment introduced is not clearly allowable since it gives rise to new issues that have to be the object of further discussions, in particular, regarding the issue of intermediate generalisation (Article 123(2) EPC) since the feature in question has been taken solely from figures 7B and 9B.

Consequently, considering that the fifth auxiliary request was filed at the latest stage of the appeal proceedings and considering the need for procedural economy, the Board exercised its discretion not to admit it into the appeal proceedings.

## Order

### For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The patent is revoked.

The Registrar:

The Chairman:



A. Vottner

G. Pricolo

Decision electronically authenticated