

Internal distribution code:

- (A) [-] Publication in OJ
(B) [-] To Chairmen and Members
(C) [-] To Chairmen
(D) [X] No distribution

**Datasheet for the decision
of 12 April 2013**

Case Number: T 0281/10 - 3.2.06

Application Number: 00122283.5

Publication Number: 1110764

IPC: B60C23/04

Language of the proceedings: EN

Title of invention:

Apparatus and method for sensing a condition of a vehicle tire

Patent Proprietor:

TRW Automotive U.S. LLC

Opponent:

Continental Automotive GmbH

Headword:

Relevant legal provisions:

EPC Art. 54, 56, 123(2)

RPBA Art. 13(1)

Keyword:

Main request - added subject-matter (yes)

Auxiliary request 1, 2, 5, 6 not prima facie allowable - not admitted

Auxiliary request 3 - reformatio in peius

Auxiliary request 4 - inventive step (no)

Decisions cited:

G 0004/93, G 0001/99

Catchword:



**Beschwerdekammern
Boards of Appeal
Chambres de recours**

European Patent Office
D-80298 MUNICH
GERMANY
Tel. +49 (0) 89 2399-0
Fax +49 (0) 89 2399-4465

Case Number: T 0281/10 - 3.2.06

D E C I S I O N
of Technical Board of Appeal 3.2.06
of 12 April 2013

Appellant: Continental Automotive GmbH
(Opponent) Postfach 22 16 39
80506 München (DE)

Respondent: TRW Automotive U.S. LLC
(Patent Proprietor) 12025 Tech Center Drive
Livonia, MI 48150 (US)

Representative: Wagner, Karl H.
Wagner & Geyer Partnerschaft
Patent- und Rechtsanwälte
Gewürzmühlstrasse 5
80538 München (DE)

Decision under appeal: Interlocutory decision of the Opposition
Division of the European Patent Office posted on
27 November 2009 concerning maintenance of the
European Patent No. 1110764 in amended form.

Composition of the Board:

Chairman: M. Harrison
Members: T. Rosenblatt
R. Menapace

Summary of Facts and Submissions

- I. By its interlocutory decision dated 27 November 2009 the opposition division found that the European patent No. 1 110 764 in an amended form according to an auxiliary request met the requirements of the EPC.
- II. The appellant (opponent) filed an appeal against this decision on 4 February 2010 and paid the appeal fee on the same day. The grounds of appeal were filed on 1 April 2010.
- III. In preparation for oral proceedings the Board of Appeal issued a communication informing the parties of its preliminary opinion. The Board stated *inter alia* that discussion appeared necessary with respect to Article 123(2) EPC.
- IV. In reply to the Board's communication the respondent (patent proprietor) submitted four auxiliary requests.
- V. Oral proceedings before the Board of Appeal were held on 12 April 2013, in the course of which the respondent submitted two additional auxiliary requests 5 and 6.
- VI. The appellant requested that the patent be revoked. The respondent requested that the appeal be dismissed or that the decision under appeal be set aside and the patent be maintained on the basis of the first, second, third or fourth auxiliary requests filed on 12 March 2013 or on the basis of the fifth or sixth auxiliary request filed during the oral proceedings on 12 April 2013.
- VII. The evidence submitted by the appellant and relevant to the present decision is the following:

D1: WO-A-96/06747,

D2: WO-A-00/34063,

F6: Copy of collated Figures 6(I) and 6(II) of D1 with lines and text added by the appellant, submitted during the oral proceedings before the Board.

VIII. The independent claims according to the respondent's main request, corresponding to the auxiliary request found allowable by the opposition division, have the following wording.

*"1. A tire condition sensor module (14) for a vehicle (10) comprising:
a tire condition sensor (78, 84) operative to sense a tire condition of an associated vehicle tire (20) and provide a tire condition signal having a characteristic indicative thereof;
a motion detector (32) operative to detect movement of the associated vehicle tire (20) and to provide a motion signal having a characteristic indicating movement of the associated vehicle tire (20);
a transmitter (44) operative to transmit a tire transmitter signal having a characteristic based on the tire condition signal; and
a controller (72) characterized in that said controller having one operating mode responsive to the motion signal in which said controller (72) controls said transmitter (44) to intermittently transmit the tire transmitter signal, said controller (72) having another operating mode responsive to the motion signal in which said controller (72) controls said transmitter (44) to transmit the tire transmitter signal only after said controller (72) determines that the tire condition signal indicates that the sensed tire condition is either above or below a first predetermined tire condition threshold, said controller (12) controlling*

said tire condition sensor to sense tire condition during each of said operating modes, and wherein said controller (72), when in said another operating mode, controls said tire condition sensor (78, 84) to periodically sense the tire condition at a rate that is less than the rate at which the tire condition is sensed when in said one operating mode."

"10. A method for monitoring a condition of a vehicle tire, said method comprising the steps of: detecting movement of the vehicle tire (20); providing a motion signal indicative of detected movement; determining whether the motion signal indicates movement of the vehicle tire; periodically activating a sensor (78, 84) to sense a condition of the vehicle tire; providing a tire condition signal having a characteristic indicative of the sensed condition of the vehicle tire; intermittently transmitting tire condition data based on the tire condition signal at a first rate when the motion signal indicates at least a first amount of detected movement of the vehicle tire; and transmitting tire condition data only after determining that the tire condition signal indicates that the sensed tire condition is either above or below a first predetermined threshold when the motion signal indicates less than the first amount of detected movement of the vehicle tire (20), wherein said step of activating the sensor includes activating the sensor at a first rate when the motion signal indicates at least the first amount of detected movement of the vehicle tire and activating the sensor at a second, rate, that is less than said first rate,

when the motion signal indicates less than the first amount of detected movement of the vehicle tire."

For simplicity, the feature *"deviation of a sensed tire condition from a predetermined tire condition threshold"*, as stated in claims 1 and 10, is referred to as a *"critical (tire) condition"* in the following.

IX. In auxiliary requests 1 to 3 the independent claim 1 is unchanged compared to the main request, whereas independent method claim 10 comprised the following amendments (underlining added by the Board):

a) According to auxiliary request 1 the preamble of claim 10 comprises the following insertion:

"A method for a tire condition sensor module (14) for monitoring a condition of a vehicle tire, said method comprising the steps of..."

b) In claim 10 of auxiliary request 2 the preamble is amended as follows:

"A method for the tire condition sensor module (14) of any of claims 1 to 9, the method for monitoring a condition of a vehicle tire, said method comprising the steps of..."

c) In claim 10 of auxiliary request 3 the final feature of claim 10 of the main request,

"wherein said controller (72), when in said another operating mode, controls said tire condition sensor (78, 84) to periodically sense the tire condition at a rate that is less than the rate at which the tire condition is sensed when in said one operating mode."

is replaced by the feature

"further including the step of periodically sensing the tire condition at a rate that varies in response to the motion signal."

- d) According to auxiliary request 4 all method claims are deleted, whereas the device claims 1 to 9 are unchanged.

- e) The single independent claim 1 of auxiliary request 5 comprises, compared to claim 1 of auxiliary request 4, the following features added at its end:

"and wherein said controller (72) enters said one operating mode in response to said motion signal indicating at least a predetermined amount of movement of the associated vehicle tire (20), said controller (72) entering said another operating mode in response to said motion signal indicating less than the predetermined amount of movement of the associated vehicle tire (20) and the sensed tire condition being greater than a second predetermined threshold."

- f) Compared to claim 1 of auxiliary request 5 the following feature is added at the end of claim 1 of auxiliary request 6:

"wherein the second predetermined threshold is a predetermined threshold pressure selected to provide a nominal pressure value which indicates that the tire sensor module has been exposed to a pressurized environment"

X. The appellant's arguments may be summarised as follows:

- a) *With respect to claim 10 of the main request in view of Article 123(2) EPC:* The feature added to claim 10 was originally disclosed only in combination with other circuit components of the module according to the description or to claim 2. Claim 10 combined the general method of granted claim 11 with features derived from a preferred embodiment of the tire condition sensor module having a specific controller operating in a particular way, such as disclosed in the description on pages 16/17 or as defined in claims 1 and 2, without however defining these specific structural features. It constituted an inadmissible extension under Article 123(2) EPC.
- b) *With respect to claim 10 of auxiliary requests 1 and 2 in view of Article 123(2) EPC:* The amendments to claim 10 were not suitable to overcome the outstanding objections because they did not introduce any limitation with respect to the specific controller of the tire condition sensor module as disclosed in original claims 1 and 2 or as described with respect to the preferred embodiment of this module.
- c) *With respect to claim 10 of auxiliary request 3 in view of G 1/99:* The deletion of the inadmissibly amended feature in method claim 10 should not be allowed because the respondent-proprietor had other options to overcome the outstanding objection. The respondent could have deleted the method claims or could have further limited these claims to the specific method disclosed in the description.

- d) *With respect to claim 1 of auxiliary request 4 in view of Article 54 EPC:* Claim 1 lacked novelty in view of the modules known from D1 or D2. For example, the controller of the module known from D1 operated in several modes. On page 18, lines 22 to 24 it was stated that the minimum time between transmissions was increased to sixty minutes. It was clear to the skilled person that this interval was not to be construed as an absolute minimum because the sixty minutes did not provide a new technical effect; rather it further increased the savings of energy. The skilled person would have recognised the possibility of further increasing the interval between successive transmissions. For very long periods there would have been no difference in the technical effect compared to the case where the intermittent transmissions would be completely suppressed. Moreover, the feature to be compared concerned ranges (a period lasting 60 minutes compared to a period of infinite length) so that the case law of the Boards of Appeal relating to ranges of parameter values applied. An interval of infinite length lacked novelty due to the lack of a new technical effect. A similar argument also applied in view of the module known from D2, which disclosed an interval of transmission lasting 30 minutes. The skilled person would thus have understood that it was also implicitly considered in these documents that the intermittent transmission should be extended to infinite periods, resulting in its suppression, so that the controller would transmit a signal only after a critical tire condition was sensed in case of a non-moving vehicle, as defined in claim 1.

On the other hand, the claim did not define what was meant by the expression "mode", in particular not when it ended nor how it was left. Therefore a broad interpretation of the claim allowed a mode to be considered as a set of steps which ended, for example, after thirty minutes had lapsed. Under this assumption one could identify (in the flow chart F6) the two modes defined in claim 1. In particular when the controller was in the "another mode", corresponding to the case of a tire standing still, the process would never pass the step 61 of intermittent transmission every 60 minutes, since the mode lasted only 30 minutes. For such a mode, tire condition data transmission occurred only for critical data as defined in claim 1.

- e) *With respect to claim 1 of auxiliary request 4 in view of Article 56 EPC:* Starting from D1 as the closest prior art, the only difference between the subject-matter of claim 1 and the known module consisted in the transmission of the tire condition data occurring only after a critical tire condition had been determined in case the vehicle was not moving. The periodic transmission every hour in D1 was not disclosed as essential, its purpose remained obscure, and it could only be imagined that it allowed the receiver station to determine whether the module continued to operate correctly, so that the driver could be informed correspondingly upon starting the vehicle. If on the other hand the periodic transmission was dispensed with, the driver still received (upon start of the vehicle) the security-relevant information related to a detected critical tire condition while the vehicle was parked. The

technical effect achieved by the omission of the periodic transmission was consequently only to save even more energy compared to the savings already realised by extending the interval between subsequent transmissions to once every hour for a parked vehicle compared to the short intervals when the vehicle was driven. The skilled person faced with the task of further reducing the power consumption of the tire sensor unit would therefore have considered every possibility to achieve this, including the suppression of the hourly transmission. This was already implicit from the passage of D1 on page 18, from which the one hour limit was disclosed to the skilled person as being an arbitrary choice which could have been selected to be much longer. The skilled person was able to balance the resulting gain in battery life against the risk involved in losing the supplementary information provided by the hourly transmissions. Also from page 22 of D1, lines 17 to 25, it was clear that the skilled person was able to make a choice between the information to be transmitted and further energy savings in case a low power condition occurred in the sensor module.

- f) *With respect to claim 1 of auxiliary requests 5 and 6 in view of Article 123(2) EPC:* Original claims 2 and 5 were each only dependent on claim 1, so that the claims provided no disclosure of the combination of all three claims 1, 2 and 5. The general part of the description only reproduced the wording of the claims. The description of the embodiment, starting from page 20, referred to Figure 3, which in step 118 was linked to the sleep mode shown in Figure 4.

According to this flow chart the sleep mode always comprised at least one broadcast step 132, contrary to the definition in claim 1 requiring a broadcast only after a detection of a critical condition, so that the description could not provide basis for the subject-matter of claim 1 of auxiliary request 5. Claim 1 of auxiliary request 6 only added further features from the description to claim 1 of auxiliary request 5 and was thus not suitable to overcome the objection to auxiliary request 5.

XI. The respondent's arguments may be summarised as follows:

- a) *With respect to claim 10 of the main request in view of Article 123(2) EPC:* The originally filed application provided a basis for the method of amended claim 10. In particular, original method claim 9 provided a basis for the more limited feature added to the claim. The title of the application, the introductory portion on page 1, first paragraph, the paragraph bridging pages 3 and 4, the paragraph following the heading "*Brief Description of the Drawings*", the text beginning on page 34, line 11, as well as originally filed pages 39 to 41 all related to a method. From these passages the skilled person would conclude also that modifications to the general method were intended and that these could be based on the description, in particular also on the passages on pages 16 and 17. On pages 10, 11, 16 and 17 the operation of the controller was disclosed from which the feature added to claim 10 could be derived. The definition of other features mentioned in this context was not required, since

these were not essential. The amendment was thus allowable under Article 123(2) EPC.

- b) *With respect to claim 1 of auxiliary requests 1 and 2 in view of Article 123(2) EPC:* The insertion in the preamble of claim 10 of auxiliary request 1 linked the general method to the sensor module. The skilled person would have concluded from the overall teaching of the application that the general method defined in the original method claims was to be performed by using appropriate sensor modules (see for example the summary of the invention, page 5, lines 9 to 18, or page 34). The skilled person also knew that to perform the general method a module had to have appropriate means. A restriction to the particular controller was nevertheless not required, as was apparent, for example, from page 7, lines 22 ff. and page 11, line 12. Auxiliary request 2 was even more limited to the operation on the specific module disclosed in the application, so that the method of this request now only defined what was originally disclosed as functional features of the controller in claims 1 and 2.
- c) *With respect to claim 1 of auxiliary request 3 in view of G 1/99:* The deletion of the feature objected to in the preceding request was intended to overcome these objections. Amending the claim by introducing additional features from the description appeared not to solve the problem since such a claim would still remain a general method and would have given rise to further problems under Article 84 EPC.

- d) *With respect to claim 1 of auxiliary request 4 in view of Article 54 EPC:* Neither D1 nor D2 anticipated the subject-matter of claim 1, since the modules disclosed therein always made intermittent transmissions, for example at least every 60 minutes according to D1. The appellant's interpretation of the two modes in the flow chart of Figures 6(I) and (II) of D1 constituted a selection of a sequence of steps which was not disclosed in the document in this way.
- e) *With respect to claim 1 of auxiliary request 4 in view of Article 56 EPC:* The subject-matter of claim 1 was not obvious because D1 specifically disclosed that the tire condition data should be transmitted every hour in order to maintain the communication of the sensor module and the receiver. The skilled person had no motivation to go against this explicit statement in D1, in particular since the extension of the transmission interval was motivated by the intended reduction in power consumption, but under the premise not to lose the communication between the two devices. Moreover, other ways to reduce the power consumption were also disclosed, still under the assumption of maintaining the communication. The solution to the problem of further reducing the energy consumption according to claim 1 could therefore only be arrived at by hindsight.
- f) *With respect to claim 1 of auxiliary requests 5 and 6 in view of Article 123(2) EPC:* Claim 1 according to auxiliary request 5 was based on the combination of claims 1, 2 and 5 as originally filed and the disclosure relating to the operation of the module according to the process illustrated

in Figure 3 and described on page 21, line 15 to page 22, line 8, in combination with the statements on page 34 made with respect to the possible modifications of the invention. The flow chart of Figure 4 in its entirety did not represent the sleep mode; rather the sleep mode ended after the decision step 130 and hence before the broadcast step 132. In step 130 it was decided whether motion had been detected. This was the condition which had to be tested to switch between the two modes defined in the claim. In Figure 4 this lead to the entry into the normal mode, similar to decision step 116 in Figure 3. The further features added in claim 1 of auxiliary request 6 were based on page 21, line 15 to 22 of the description.

Reasons for the Decision

1. The appeal is admissible.
2. Main request - Article 123(2) EPC
 - 2.1 The amended independent method claim 10 is based on granted claim 11, which in turn corresponds to original independent method claim 7, to which (at the end) the following feature is added:

"wherein said step of activating the sensor includes activating the sensor at a first rate when the motion signal indicates at least the first amount of detected movement of the vehicle tire and activating the sensor at a second, rate, that is less than said first rate, when the motion signal indicates less than the first amount of detected movement of the vehicle tire."

As acknowledged by the respondent, this feature has no explicit or literal basis in the originally filed application documents. From the further passages of the application as filed cited by the respondent as support for the amendment, the resulting subject-matter of amended claim 10 cannot be directly and unambiguously derived either.

Among the parts of the original application referred to by the respondent, original dependent method claim 9 defines *inter alia* the further method "*step of periodically sensing the tire condition at a rate that varies in response to the motion signal*". This is however not a disclosure for the added more specific feature. The other method steps in original claim 9, drafted by use of the conjunctions "and/or" as alternative or additional features to the above cited step, concern details of the connection of the sensor to an electrical power source. They therefore do not support the above more specific amendment either. Moreover, the original apparatus claims considered on their own or in combination with the original method claims can also not serve as a basis for the amendment of the general method claim. Claim 1 defines an apparatus comprising essentially a tire condition sensor, a motion detector, a transmitter and a controller having two operating modes, responsive to a motion signal from the motion detector, to control the transmitter to transmit tire condition data either intermittently or only after a critical condition has been detected. According to claim 2, said controller, when in one of the two modes, "*controls said tire condition sensor to periodically sense the tire condition at a rate that is less than the rate at which the tire condition is sensed when in*" the other of the two modes. Similarly to claim 9, claim 2 also defines

alternative or additional functions (preceded by the conjunctions "and/or") which again are not linked to the aforementioned feature. Neither claim 2 nor any of the remaining apparatus claims therefore discloses the added feature of present claim 10 independently of any of the structural features of the module defined in combination by original claims 1 and 2, in particular without the use of a module which comprises *inter alia* a controller operating, and hence being specifically adapted to operate, in the way defined in them. The subject-matter of amended method claim 10 is not limited to the use of such a module or to the implementation of the relevant method steps by way of a corresponding specific controller.

The description on pages 10 to 12 and 16 to 18 discloses a preferred embodiment of a tire condition sensor module. However, similarly to claim 2, the description of this preferred module discloses the added feature only in combination with a controller having two operating modes, and there is no indication in the cited passages that the periodic activation of the sensors is intended to be realised independently of any of the structural and functional features of this specific controller. These cited pages do not contain any reference to a general method for monitoring a vehicle tire condition as defined in original claim 7 either. Also the fact that the controller may be realised in a number of alternative ways, for example by discrete components instead of a microprocessor, microcontroller or ASIC, as stated on page 11, lines 10 to 15, would not be understood by the skilled person such that a module without such a controller was originally disclosed by the inventor. Furthermore, a process of operating the preferred embodiment of the sensor module is described and illustrated by reference

to three detailed flow diagrams representing a sequence of process steps in Figures 3 to 6 (see also page 5, line 19 to page 6, line 4 or page 19, line 17 ff.), again without any reference to a general method of monitoring. The introductory parts of the description, comprising the sections "Technical field", "Background of the Invention" and "Summary of the invention", generally state that the invention relates to an apparatus and method for sensing a condition of a vehicle tire and further reproduce almost literally the wording of original independent claims 1 and 7, without mentioning any detail in view of the activation of the tire condition sensor at all. At the end of the description on page 34, line 4 to 19, general statements are made with respect to possible changes regarding the process of operation, followed by a general statement relating to possible improvements, changes and modification of the invention which would be recognisable by the skilled person and intended to be covered by the appended claims. These statements as well as the following final section, on pages 35 to 41, again entitled "Summary of the invention", which is in the form of a number of clauses that essentially repeat the wording of the original claims, is far too general and does not enable the skilled person to directly and unambiguously derive the added feature as such, let alone in combination with the method steps of a general method of monitoring as defined in original claim 7.

The subject-matter of amended method claim 10 hence extends beyond the content of the application as filed, contrary to the requirement of Article 123(2) EPC, so that the respondent's main request is not allowable.

3. Auxiliary requests 1 and 2 - Article 13(1) RPBA

- 3.1 According to Article 13(1) of the Rules of Procedure of the Boards of Appeal (RPBA) any amendment to a party's case, here the respondent's case, after it has filed its reply to the grounds of appeal may be admitted and considered at the Board's discretion. The discretion shall be exercised in view of inter alia the need for procedural economy. In this respect the Boards frequently consider whether the proposed amendment is *prima facie* allowable in the sense that it at least overcomes the outstanding objections, otherwise its admittance would be contrary to the requirement of procedural economy.
- 3.2 Compared to the main request, claim 10 of auxiliary requests 1 and 2 has been further amended by inserting after the designation of the claimed subject-matter, i.e. "A method", the features "*for a tire condition sensor module (14)*" and "*for the tire condition sensor module (14) of any of claims 1 to 9, the method*", respectively. These amendments do not overcome the objections raised with respect to the main request. In neither of the two requests is the previously added feature, concerning the sensor activation at two rates in response to a motion signal, limited by further amendments to being performed by the specific controller of the specific tire condition sensor module as disclosed in the application as filed, in particular as disclosed in claims 1 and 2 or as described in regard of the preferred embodiment. That the controller is not restricted to a particular type of controller, as stated on pages 5 and 11, does not mean that it may be entirely dispensed with and that the functions attributed to it could be carried out independently of such a controller having two modes of operation and controlling data transmission and data sampling based on a motion signal received from a motion detector.

Even the specific reference introduced into claim 10 of auxiliary request 2 to the sensor module "*of any of claims 1 to 9*", which establishes a link between the general method and the claimed sensor module, does not result in a combination of features which is originally disclosed. The claim still does not define that, for example, the added method steps in the main request (which were found to constitute subject-matter contrary to Article 123(2) EPC), are necessarily carried out by the controller. The claim covers the technically meaningful possibility that the method is performed by operating a sensor module according to claim 1 whereby, for example, a controller having two operating modes is used to control the transmitter in response to the motion signal, and where the sensor sampling rates (as a function of the motion signal) are controlled by other means, such as a second separate controller. This combination of features is however not directly and unambiguously derivable from the application.

Claim 10 of auxiliary request 1 is broader than that of auxiliary request 2 because only a general tire condition sensor module is defined, so that the previous finding with regard to auxiliary request 2 also applies to auxiliary request 1.

3.3 Consequently, the amendments in auxiliary requests 1 and 2 are *prima facie* not suitable to overcome the objection under Article 123(2) EPC to the main request. In view of the need for procedural economy the Board thus exercised its discretion under Article 13(1) RPBA not to admit these requests into the proceedings.

4. Auxiliary request 3 - G 1/99

4.1 In auxiliary request 3, claim 10 has been amended by deleting the inadmissible amendment introduced in the proceedings before the opposition division and by adding the features of granted claim 13.

4.2 Although the proprietor of the patent was adversely affected by the interlocutory decision in that its main request before the opposition division was not allowed, the proprietor did not file an appeal. The respondent-proprietor is thus primarily limited to defend its patent in the form of the auxiliary request considered allowable by the opposition division. Amendments proposed by respondent may be rejected as inadmissible by the Board if they are neither appropriate nor necessary (G 4/93 and G 9/92, Headnote II, OJ EPO 1994, 875). An exception to this principle of prohibition of *reformatio in peius* may be made in order to meet an objection put forward by the opponent-appellant or the Board during the appeal proceedings, in circumstances where the patent as maintained in amended form would otherwise have to be revoked as a direct consequence of an inadmissible amendment held allowable by the opposition division in its interlocutory decision. However, in such circumstances, as in in the present case, the proprietor-respondent is not entirely free to amend the claims. Rather, it may be allowed, in the first place, to file an amendment introducing one or more originally disclosed features which limit the scope of the patent as maintained. Only as a third option, if other amendments are not possible, it may delete the inadmissible amendment (see Headnote of G 1/99, OJ EPO 2001, 381).

4.3 In the present case the respondent immediately chose to delete the inadmissible amendment without having proven that other amendments, for example the addition of further features from the preferred embodiment, mentioned as the first option in the headnote of G 1/99, are not possible. The respondent argued that an amendment by the addition of further limiting features appeared almost impossible, because it probably would have required the insertion of the entire description into the claims and may have given rise to a lack of clarity. This argument is found unconvincing because it merely amounts to an unproven allegation. Directly choosing the third option without having made any *bona fide* attempt to overcome the objection by the higher-ranking options does not constitute an appropriate amendment. As pointed out by the appellant, the deletion of the method claims would also have been possible, without losing the patent. Consequently, the amendment is clearly not allowable, so that auxiliary request 3 was not admitted into the proceedings (Article 13(1) RPBA).

5. Auxiliary request 4 - Article 13(1) RPBA

In this auxiliary request there are no method claims, whereas claims 1 to 9 are those of the main request which the opposition division considered to meet the requirements of the EPC. Independent claim 1 is based on a pure combination of granted claims 1 and 2, corresponding to original claim 1 and the first of the alternatives defined in original claim 2. The Board is thus satisfied that the requirements of Articles 84 and 123 EPC are met.

The Board considers this amendment to constitute an appropriate reaction to the objection standing against

the maintenance of the patent according to the main request. The Board and the appellant would have been required to consider the allowability of these same amended claims in view of the requirements of the EPC also in case the amendments to the method claims of the main request would have been found to comply with the requirement of Article 123(2) EPC, so that this request did not not raise any new issues. The appellant did not raise any objection against the admission of this request. The request was thus admitted into the proceedings and considered (Article 13(1) RPBA).

6. Auxiliary request 4 - Article 54 EPC

6.1 Claim 1 of auxiliary request 4 is novel over the prior art submitted by the appellant (Article 54(1), (2) and (3) EPC). Neither of documents D1 or D2 - D2 being published in the priority interval of the patent in suit and constitutes thus prior art according to Article 54(3) EPC - discloses the feature according to which the controller in its "another operating mode" *"controls said transmitter to transmit the tire transmitter signal only after said controller determines that the tire condition signal indicates that the sensed tire condition is either above or below a first predetermined tire condition threshold"* (emphasis added by the Board; in the following called the "only after" feature).

6.2 The appellant contested the novelty of claim 1 essentially along two lines of argument which are both found unconvincing.

6.2.1 The first line of argument, based on the implicit disclosure of an infinite time period between two successive transmissions and thereby on the effective

suppression of these data transmissions, fails because neither D1 nor D2 discloses entirely suppressing the intermittent transmission of the tire condition data in case of a standing tire (the "another mode" in claim 1) so as to transmit the data only after a critical tire condition is determined. Nor do D1 or D2 disclose, also not implicitly, an infinite time period. In D1 on page 18, lines 20 to 26, it is indeed stated that, when the vehicle is not in use, the minimum time between the transmissions of the tire condition data is increased to sixty minutes in order to reduce power consumption of the wheel transmitter unit/module. From these statements it is not directly and unambiguously derivable that the intermittent transmission should be suppressed entirely. To the contrary, it is explicitly stated on page 20 lines 1 to 14, that in order to maintain the communication between the sensor module/wheel units and the receiver, data shall be transmitted once every hour. Similarly for the module known from D2, it is stated that for a standing vehicle tire the transmission of data is between 5 to 30 minutes, preferably between 10 to 15 minutes, and further that the period between transmissions is preferably substantially extended compared to the situation of a moving vehicle tire (page 5, lines 3 to 22). But again it is not disclosed to suppress this intermittent transmissions entirely. When required to determine the content of a prior art document in regard to the examination of novelty, the skilled person is not assumed to interpolate the specific teaching of the document to alternative or other embodiments which would achieve similar purposes, at least as long as there is no specific incitation to do so. Interpolating from the extension of the transmission periods to even longer periods and then deducing that the transmission could even be suppressed involves additional

reflections directed to the search for alternative solutions or embodiments achieving the same or a similar purpose and exceeds the limits for assessing the implicit disclosure of a document. Finally the Board disagrees with the appellant's position that the case law developed by the Boards of Appeal for the assessment of novelty of claims defined by parameter ranges would apply. By the "only after" feature, the claim does not define a time range, rather it defines a conditional method step which is entirely independent of any time measurement.

6.2.2 Also the respondent's second line of argument, based on the missing definition of the term "*operating mode*" in claim 1, its allowably broad interpretation applied to the process depicted in F6, fails. It is merely based on a comparison of the claimed subject-matter and the prior art module of D1 restricted to an arbitrary isolation of particular method steps in F6, rather than comparing the actual structural features limited by the described functional or process features. The controller or microprocessor of the wheel module of D1 is programmed or designed to operate according to the flow chart Figures 6(I) and (II), see page 14, lines 12 to 17 and page 18 ff. The teaching of D1 is consequently to provide a tire condition sensor module with a controller specifically programmed or adapted to operate according to the flow chart of Figure 6, so that in case of a standing tire (steps 53, 55-60) a data transmission is carried out periodically every sixty minutes (steps <60=yes> and 61) or, if the time since the last transmission is less than sixty minutes (step <60=no>), to transmit whenever a critical condition was determined (steps 63-69). It cannot be directly and unambiguously derived from D1 that the controller be programmed without the conditional

sequence of process steps 60 and 61. Hence the controller of the module of D1 is different from the controller operating the module according to claim 1 in that it is programmed so as to, in case of a standing wheel ("*another mode*" in claim 1), transmit not "*only after*" a critical condition was determined but rather also periodically every 60 minutes.

7. Auxiliary request 4 - Article 56 EPC

7.1 The only distinguishing feature between the subject-matter of claim 1 and the module known from D1, which is considered to represent the closest prior art, is the above identified "*only after*" feature (cf. 6.1).

7.2 The technical effect achieved by this feature according to the patent in suit is that in the so called "*sleep mode*" (the "*another mode*" in claim 1), i.e. when the vehicle is parked, energy of the internal power supply of the module is conserved when the data is transmitted only after a critical tire condition had been determined compared to the normal operation mode when the vehicle is in use (in said "*one operation mode*" according to claim 1) and where data is intermittently transmitted at comparatively shorter intervals (paragraphs [0035, 36] or, in the application as filed, page 18, line 10 to page 19, line 3).

7.3 According to D1 the time period between the intermittent transmissions of the tire condition data in case of a standing tire is extended to once every hour, compared to the time period of at least every 10 minutes for a vehicle in use, which reduces the power consumption of the wheel transmitter unit to about one fifth of the consumption when the vehicle is in use (page 18, lines 15 to 26). The purpose of the extended

transmission periods is the same as envisaged in the patent in suit (patent specification, first sentence in [0036]). According to D1 it is nevertheless considered necessary to maintain this intermittent transmission in order to maintain the communication between the tire module and the receiver. D1 is silent as to the purpose of the maintenance of this communication. This intermittently maintained communication does in any case not appear to be relevant to the safety since important or critical changes in tire condition of the standing vehicle, such as a tire pressure change by more than ± 2 psi or a tire temperature change of more than $\pm 4^{\circ}\text{C}$ are transmitted in any case (page 20, line 11 to page 21, line 11; Fig. 6(I+II), steps 63-69). A person intending to drive the vehicle would thus receive this information upon starting. Suppressing the periodic transmission of tire condition data and transmitting it only after a critical condition occurs consequently would only have the technical effect of further reducing the power consumption of the module.

7.4 Reducing power consumption is a general concern for a skilled person in the field of tire condition sensor modules carried on the wheel operated by an internal power source. Also D1 deals with this issue and considers, besides the feature already mentioned before (extending the transmission period in case the vehicle is not in use), several additional measures for this purpose (page 12, lines 1 to 7: use of ASICs; page 24, lines 10 to 13: data coding; page 37, lines 3 to 13: use of ceramic resonators).

7.5 Starting from the module known from D1 the objective technical problem to be solved may therefore be considered to further reduce the power consumption of the known tire condition sensor module.

7.6 The solution proposed in claim 1 is obvious to the skilled person from common general knowledge. It belongs to this knowledge in the field of tire condition monitoring systems that the power consumption of tire sensor modules may be considerably reduced when the time period between the subsequent transmissions of data is extended, as is also mentioned in the statement in D1 with respect to the extended time period between subsequent transmissions of the data when the vehicle is not in use (page 18, lines 20 to 26). The skilled person is also conscious that energy would be further saved when the intermittent transmission would be entirely avoided; it may even be considered to belong to the general knowledge that switching off as long as possible certain "uncritical" components of a system powered by a single power source of limited capacity saves energy and increases the lifetime of the system. Faced with the objective technical problem of further reducing the module's power consumption, the skilled person would have considered every possibility at hand of reducing the module's power consumption and therefore also the possibility to avoid the tire data transmission for as long as possible, on the condition that the information relevant to safety is still transmitted to the receiver. In the absence of any apparent safety-relevant purpose of the selected transmission period of once every hour according to D1, the skilled person would conclude that the maintenance of the communication between tire modules and receiver with an extended intermittent transmission period is not necessary having regard to the fact that any critical and hence safety-relevant tire condition would be transmitted anyway to the on-board receiver of the vehicle (Fig. 6(II), steps <63=yes> or <64=yes> and <65-69>). The skilled person would conclude that the

intermittent transmission can be entirely dispensed with without affecting the security of the monitoring system's operation, thereby arriving without inventive skill at a tire condition sensor module according to claim 1.

- 7.7 The Board does not accept that the above conclusion relies on hindsight or that it would go against the explicit teaching of D1, as alleged by the respondent.

An objective technical problem has been formulated and its solution is exclusively based on the common general knowledge of a skilled person as well as considerations which do not exceed the normal competence of the skilled person. The respondent did not argue that these considerations exceeded the common general knowledge of the skilled person. Consequently the argument based on alleged hindsight is not persuasive.

The fact that D1 states that the communication between the tire modules and the receiver in cases of a vehicle not in use should be maintained, and therefore seemingly teaches away from the suppression of the intermittent transmissions, is not a pointer to an inventive step in the present case. As has been noted above, the purpose of the maintained communication by the intermittent transmissions remains obscure. It is apparently not safety-related and only affects the amount of additional information transmitted to the receiver unit. The respondent could not point to any other passage in D1 from which it would have appeared that the maintenance of the communication between tire modules and central receiver unit in case of a standing vehicle, would be essential to the invention disclosed therein. The skilled person, faced with the above objective problem, is able to weigh up the advantage of

a decision to suppress the intermittent transmissions (reduce power consumption) against its disadvantage (loss of additional, but not safety relevant information) and to make the appropriate choice without inventive skill.

In view of the objective technical problem it is also irrelevant that D1 already teaches different ways of reducing the power consumption of the tire sensor module. The skilled person faced with the objective problem would not for this reason abandon a quest for further reduction of power consumption.

7.8 Hence, the subject-matter of claim 1 of auxiliary request 4 does not involve an inventive step and the requirement of Article 56 EPC is thus not met. The request to maintain the patent based on these amended claims cannot therefore be allowed.

8. Auxiliary requests 5 and 6 - Article 13(1) RPBA

8.1 Compared to auxiliary request 4, claim 1 of auxiliary request 5 comprises the additional feature of claim 5 as original filed (cf. item IX (e)) above.

The originally filed claims 2 and 5 each only depend on original claim 1 respectively. A combination of the features of claims 1, 2 and 5 is thus not directly and unambiguously derivable from the originally filed claims alone. Also the originally filed description does not disclose this combination of features. The passage bridging pages 21 and 22 referred to by the appellant relates to the process of operation of the preferred embodiment of a tire condition sensor module, the process being illustrated by the flow diagrams of Figures 3 to 6. The features taken from claim 5,

relating in particular to the second condition defined therein for the controller to enter "*said another operating mode*" in response to the sensed tire condition being greater than a second predetermined threshold, at first sight appear to correspond to a portion of the flow charts in Figures 3 and 4. According to the flow chart of Figure 3 in decision step 118, illustrated by a diamond box, a sensed pressure is compared to a threshold pressure P1. If the sensed pressure is greater than P1, the process illustrated in Figure 3 enters in step 120 a "sleep mode", illustrated by an oval box and labelled "ENTER SLEEP MODE (Fig. 4)". Thus, the testing of the condition recited from original claim 5 above corresponds to step 118 and the claimed "*another operating mode*" is embodied by the "sleep mode" illustrated in Figure 4. The flow chart of Figure 4 contains a sequence of steps beginning at step 120 depicted by an oval box, labelled "SLEEP MODE". The flow chart terminates also with an oval box 136 labelled "ENTER NORMAL MODE (Fig. 5)". The "sleep mode" may only be left to enter the "normal mode" in process step 136 by passing through a preceding and unconditional process step 132, labelled "BROADCAST TIRE CONDITION DATA". On page 16, lines 21 ff. and on page 17, lines 18 to 23, a "first operating mode", referred to as the "normal operating mode", and a "second operating mode", referred to as the "sleep mode", are disclosed as operating modes of the controller (apart from additional calibration and storage modes which are however not relevant in the present context). The "sleep mode" is described on pages 22, line 15 to page 25, line 6 with reference to the flow chart of Figure 4 as explained before and there is no indication that the "sleep mode" should be understood as comprising less or only a selection of

the steps illustrated therein. The description thus does not comprise any indication that the sleep mode is actually already ended before the broadcast or transmission step 132 or that this step 132 belongs to some other mode of operation, not being the sleep mode, as argued by the appellant.

According to claim 1 as originally filed and granted the only instance of transmitting the tire condition data when the controller is in said "another operating mode" shall be only after a critical tire condition was determined, in contrast to what is disclosed for the "sleep mode" of the preferred embodiment of the tire condition sensor module. The description and the claimed combination of features of original claims 1, 2 and 5 are thus at least inconsistent and may not serve as a basis for a clear and unambiguous disclosure of the claimed combination of features. Even the passages on page 34 referred to by the respondent as a basis that the process described beforehand may be subject to variation does not resolve this defect.

It follows that the subject-matter of amended claim 1 according to auxiliary request 5 is not directly and unambiguously derivable from the claims alone and/or in combination with the description as originally filed, contrary to the requirement of Article 123(2) EPC.

- 8.2 Compared to auxiliary request 5, in auxiliary request 6 a further feature has been added based on the passage of the originally filed description on page 21, lines 15 to 22, to clarify the meaning of the terms cited in granted dependent claim 9. Since the further feature added in claim 1 of auxiliary request 6 only introduces a more precise definition of the "second predetermined threshold" referred to in original claim 5, it has no

effect on the lack of disclosure of the combination of features according to claim 1 of auxiliary request 5 and thus cannot change the Board's finding that the requirement of Article 123(2) EPC is not met.

8.3 The amendments according to claim 1 of auxiliary requests 5 and 6 are therefore clearly not allowable, so that the Board did not admit these requests into the proceedings (Article 13(1) RPBA).

9. In summary, the respondent's main request cannot be allowed because it contravenes the requirement of Article 123(2) EPC, whereas auxiliary request 4 cannot be allowed because the claimed subject-matter does not meet the requirement for inventive step (Article 56 EPC). The auxiliary requests 1 to 3, 5 and 6 were not admitted into the proceedings (Article 13(1) RPBA). There is thus no request on file with which the patent can be maintained, so that the request of the appellant to set aside the decision and to revoke the patent is allowed.

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:



M. H. A. Patin

M. Harrison

Decision electronically authenticated