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# D E C I S I O N
## of 28 September 1999

**Case Number:** T 0600/97 - 3.2.1

**Application Number:** 91305938.2

**Publication Number:** 0465188

**IPC:** B60C 15/06

**Language of the proceedings:** EN

**Title of invention:**
Passenger radial tyre

**Patentee:**
Sumitomo Rubber Industries Limited

**Opponent:**
Continental AG

**Headword:**
-

**Relevant legal provisions:**
EPC Art. 123(2), (3), 56

**Keyword:**
"Amendments - added subject-matter (no)"
"Amendments - opposition proceedings"
"Inventive step (yes)"

**Decisions cited:**
-

**Catchword:**
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

**Case Number:** T 0600/97 - 3.2.1

**D E C I S I O N**
**of the Technical Board of Appeal 3.2.1**
**of 28 September 1999**

**Appellant:** (Proprietor of the patent)
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**Representative:**
-

**Decision under appeal:**
**Decision of the Opposition Division of the European Patent Office posted 25 March 1997 revoking European patent No. 0 465 188 pursuant to Article 102(1) EPC.**

**Composition of the Board:**

**Chairman:** F. A. Gumbel
**Members:** P. Alting van Geusau
J. H. van Moer

## Summary of Facts and Submissions

I. The mention of the grant of European patent No. 0 465 188 in respect of European patent application No. 91 305 938.2, filed on 1 July 1991, was published on 7 September 1994.

II. Notice of opposition was filed by the respondent (opponent) on 7 June 1995.

In respect of an alleged lack of novelty and inventive step the opposition was in particular supported by the documents

D1: US-A-4 779 659

D2: DE-A-2 325 530

D5: EP-A-0 339 511

D6: EP-A-0 251 980

III. By decision which was given at the end of oral proceedings held on 6 March 1997 and posted on 25 March 1997 the Opposition Division revoked the patent.

The Opposition Division was of the opinion that the subject-matter of the granted claim 1 (main request) lacked novelty when compared to the prior art disclosed in D1 and that the subject-matter of the independent claims 1 in accordance with the appellant's (proprietor's) first and second auxiliary requests lacked an inventive step when having regard to the prior art disclosed in D1 and D5 or D1 and D6.

IV. On 2 June 1997 a notice of appeal was lodged against that decision together with payment of the appeal fee. Together with the statement of grounds of appeal, which was filed on 1 August 1997, the appellant submitted new sets of claims.

V. In a communication issued in preparation for oral proceedings the Board expressed the provisional opinion that already for formal reasons the sets of claims filed by the appellant did not appear acceptable. Furthermore, considering the appellant's explanations in support of inventive step, the claims did not appear to define clearly the subject-matter for which protection was sought.

It was further noted that the respondent introduced with its response dated 23 February 1998 document

D8: US-A-3 232 331.

Since the Board did not see that this late filed prior art document was more relevant than the documents already in the proceedings it envisaged disregarding this document in accordance with the provisions of Article 114(2) EPC.

VI. Oral proceedings were held on 28 September 1999.

The chairman announced that because of lack of relevance the late cited D8 would not be considered in the further proceedings.

At the oral proceedings the appellant filed new claims 1 to 8, an adapted description, pages 1 to 7 and

drawings, Figures 1 to 7.

The appellant requested setting aside of the decision under appeal and maintenance of the patent in amended form on the basis of these new documents.

Claim 1 of the new set of claims reads as follows:

"1. A pneumatic tyre comprising a tread (2), sidewalls (3), a pair of spaced apart beads (4), each reinforced by a bead core (5), a radial carcass (6) having a main portion (6A) extending around the tyre and edges turned up around each bead core (5) from the axially inner side to the outer side to provide a turned up portion (6B) wherein, in each sidewall, a reinforcing ply layer (9) extends radially outwardly from the height of the bead core (5) into the sidewall such that the height (H9ad, H9bd), of the radially inner edge of the reinforcing ply layer is no higher than the height (Hf) of the rim flange of the wheel for which the tyre is designed and wherein the height (H9au, H9bu) of the radially outer edge of the reinforcing ply layer is at least 0.25 times the tyre section height (Ht); characterised in that the main portion (6A), turn up (6B) and reinforcing ply layer (9) are directly adjacent radially outwards of the bead core (5) and over the full length of the reinforcing ply layer (9); in that no bead apex and no bead filler is present at all and in that the turned up portion (6B) is wrapped closely around the bead core (5)."

The respondent requested that the appeal be dismissed.

VII. The appellant's submissions in support of its request

can be summarised as follows:

The present claims fulfilled the requirements of Article 123(2) EPC when taking into account the skilled person's interpretation of the disclosures in the originally filed application documents. Furthermore, the twofold condition concerning the position of the reinforcing ply layer as defined in the pre-characterising and characterising portions of claim 1 limited the extent of protection when compared to the granted claim so that the provision of Article 123(3) EPC was also met.

Considering prior art tyres in general, it should be remembered that each tyre construction was a compromise in itself aiming at satisfying a plurality of diverging requirements. Therefore the skilled person normally would not change such known composition by introducing or omitting parts disclosed in another combination in other tyres.

Considering the tyre known from D1, only different combinations of carcass and chafer layers with lower and upper bead fillers were disclosed. Therefore, no teaching whatsoever was derivable from D1 to omit the bead apex and the bead filler.

The tyre known from D5 relied on outer abrasion strips of substantial size and weight to compensate for the absence of a bead filler. The tyre disclosed in D6 lacked a bead apex but was concerned with securing a very short turn-up portion in a desired location without any consideration being given to additional cord layers in the side parts of the tyre. Because of

the different issues and problems involved in the tyres disclosed in D5 and D6, the skilled person would not find any exploitable information for improvement in respect of a reduction of weight of the tyre known from D1.

D2, further relied upon by the respondent was less relevant than D1 because of its shorter turn-up portions. I any case also D2 did not suggest to omit the bead apex and instead provide the characterising features as defined in present claim 1 of the patent in suit.

VIII. The respondent disputed the appellant's view. Its arguments may be summarised as follows:

The new claim 1 was not acceptable for reasons of Article 123(2) EPC because neither the feature "directly adjacent" nor the feature "that no bead apex is present at all" was immediately and unambiguously derivable from the application documents as originally filed. Also in respect of the provisions of Article 123(3) EPC the new claim 1 was not acceptable because it was no longer specified that the main portion, turn-up and reinforced layer were substantially radially outwards of the height of the rim flange.

When comparing the pneumatic tyre of claim 1 with the tyre of the closest prior art represented by D1, the sole difference resided in the omission of a bead apex. Both D5 and D6 disclosed tyres with or without bead apex pieces and D5 proposed to wrap the carcass portion closely around the bead core and to vary the thickness

of the abrasion strip to compensate for the absence of the bead apex. It was apparent that an omission of the bead apex reduced the weight of the tyre but also led to a reduction of stiffness and, consequently, of the driving stability. Since the tyre according to D1 had reinforcing layers for increasing the stiffness of the side wall the skilled person would immediately realise, in case a lighter tyre was wanted, that the bead apex could be omitted and that then the carcass turn-up portion should be closely wound around the bead core. No inventive activity was therefore necessary to arrive at the tyre with the combination of features as presently claimed.

Similar considerations applied when starting from the tyre disclosed in D2.

## Reasons for the Decision

1. The appeal is admissible.

2. *Amendments*

2.1 Claim 1 is based on granted claims 1 and 2 which are mere repetitions of the originally filed claims 1 and 2.

It is further specified in claim 1 that

- the reinforcing ply layer extends outwardly from the height of the bead core,

- the main portion, turn-up and reinforcing ply layer are directly adjacent radially outwards from the bead core and over the full length of the reinforcing ply layer,

- no bead apex and no bead filler is present.

These features are disclosed both in the granted patent and in the patent application as originally filed in relation to the embodiments described with respect to Figures 3, 5, 7 and 10.

2.2 The respondent submitted that in particular neither the indication "directly adjacent" nor that there was "no bead apex at all" could be unambiguously derived from the original application documents.

With reference to the fourth paragraph on page 22 of the originally filed description (see also lines 1 to 3 on page 6 of the granted patent) different alternatives were originally disclosed, some also including thin rubber layers between the adjacent plies. However, in accordance with the original text such layers "may" be disposed to mitigate shearing stress between the layers, which implies an alternative in which no such layers are present at all. This does not exclude that sufficient rubber material must be present between the layers to provide bonding of the layers to each other.

In respect of the omission of the bead apex and bead filler reference can be made to the embodiments shown in Figures 3, 5, 7 and 10 (both in the originally filed application documents and granted patent) and relevant text passages which explicitly mention that the bead

apex is completely eliminated. It is further shown in the Figures 3, 5, 7 and 10 that no bead filler is present either.

2.3 The respondent further submitted that the scope of the granted claim 1 was extended in that the reinforcing ply layer could now start from a bead core being positioned higher than the rim flange of the wheel and that therefore the requirements of Article 123(3) EPC were not fulfilled.

The Board cannot follow this opinion. It is clearly specified in claim 1 that the condition according to which the reinforcing ply layer extends radially outwardly from the height of the bead core is additional to the condition according to which the reinforced ply layer is no higher than the height of the rim flange of the wheel. This further condition therefore limits in this respect the scope of protection to that conferred by the patent as granted and clearly excludes an embodiment as mentioned by the respondent.

2.4 The subject-matter of the dependent claims 2 to 8 concerns essentially repetitions of that of granted claims 6 to 12, which are themselves repetitions of the originally filed claims 6 to 12.

Claim 2 was amended to bring it into line with the content of claim 1 and in the dependent claims 3 to 8 some reference numerals were corrected.

2.5 The description was amended to exclude the subject-matter no longer covered by the amended claims and for

the rest includes some clerical corrections.

2.6. In view of the above assessments no objections under Article 123(2) and (3) EPC arise against the present patent documents.

3. *Novelty*

Novelty of the subject-matter of claim 1 follows from the fact that the available prior art does not disclose a tyre having the combination of characterising features of claim 1.

Novelty was in fact not in dispute in the appeal proceedings.

4. *Inventive step*

4.1 The closest prior art is represented by the low aspect ratio tyre disclosed in D1. This prior art tyre undisputedly comprises the combination of precharacterising features of claim 1 (see page 1, line 15 of the amended patent description)

4.2 In such a low aspect ratio tyre a weight reduction is wanted to achieve a further improvement of car performance in respect of running performance, fuel consumption and the like.

The underlying problem to be solved by the patent is therefore to provide a pneumatic tyre in which the tyre weight is decreased but without decreasing the steering stability (see page 1, lines 7, 8 and 16, 17 of the amended patent description).

This problem is solved by the pneumatic tyre in accordance with claim 1. A reinforcing ply layer is provided in each bead and sidewall and no apex is present. This provides lower sidewall stiffness in combination with the carcass turn-up portions (see page 2, lines 16, 17) leading to a corresponding reduction of the lateral spring constant and thus increased running performance but, by maintaining the longitudinal spring constant, sufficient stability in the running direction of the tyre is ensured in order not to degrade the steering stability by any appreciable amount (see page 5, lines 10 to 24 and Table 1). Because of the omission of the bead apex, usually made of a hard, high weight rubber, a reduction in weight is achieved.

4.3 Considering the available prior art it is to be noted that none of cited documents discloses or suggests the idea of omitting a bead apex and bead filler and compensating the resulting loss of stability by providing a main portion, turn-up and reinforcing layer in the claimed position together with a turn-up portion that is closely wrapped around the bead core to further limit the size of the bead.

4.4 The respondent submitted during the oral proceedings that the skilled person was generally well aware of the fact that omission of the bead apex would result in a lighter tyre but that driving stability would be negatively influenced. With reference to the results shown in the tables in the description of the patent in suit it was clear that the claimed tyre had a reduced driving stability as compared with the tyre of D1. However, if such reduced driving stability was

acceptable the skilled person would gain sufficient teachings from D1 to arrive immediately at the tyre claimed.

Considering this line of argument the Board observes that, contrary to the opinion held by the respondent, the tyres in the table relating to the remaining examples do not vary significantly in steering stability. Anyhow, although D1 addresses the effect of the chafer layers for increasing the lateral stiffness (see column 3, lines 35 to 40) the invention disclosed in this document relies on the combined application of fillers and chafer layers and does not teach that the steering stability obtained by using such combination could be achieved in a similar manner by arranging cord layers in a particular manner starting from the bead core, as claimed in claim 1 of the patent in suit.

4.5 The respondent further submitted that the skilled person would be led to omit the bead apex and the bead fillers of the tyre disclosed in D1 when a reduction of weight was envisaged because this was also an issue in the documents D5 and D6, both showing tyres in which the bead apex was dispensed with.

However, in the Board's opinion, since the invention disclosed in D1 is concerned with different combinations of chafer layers and of bead fillers to enhance the driving stability, there is, from an objective point of view, no reason why the skilled person would decide to omit the fillers in such a combination.

The tyres disclosed in D5 and D6 concern specific

alternative tyre constructions. The appellant did not bring forward convincing arguments why single features of these constructions would be transferred by the skilled person in isolation to the tyre construction of D1.

In this respect it is to be noted that in the tyre disclosed in D5, which prior art is concerned with reduction of manufacturing costs and tyre weight, an abrasion strip of varying thickness is added to the bead portion to compensate for the absence of a bead filler and there is still a small bead apex present. Therefore even if the skilled person would consider combining the teachings of D1 and D5 he would not arrive at the combination of characterising features of claim 1 under consideration but rather at a construction having an increased bead filler or abrasion strip.

D6 is essentially concerned with locking of a very short turn-up portion and although no bead apex is present it is not seen what relevant teaching could be derived by the skilled person to introduce the combination of characterising features of claim 1 in the tyre in accordance with D1.

In an attempt to substantiate a link between the tyres of D1 and D6 the respondent pointed at the arrangement shown in Figure 4 of D6 and submitted that the toe guard 432 should be considered a reinforcing ply layer of the form disclosed in D1. The Board considers such opinion to be based on hindsight because neither the function of the toe guard 432 nor the size with respect to the tyre section height correspond to the

reinforcing ply layer disclosed in D1 or specified in claim 1 of the patent in suit.

4.6 The respondent also relied upon the combination of D2 and D5 or D6 for substantiation of the obviousness of the claimed subject-matter.

However, these combinations also fail to lead the skilled person to recompose the tyre bead portion in the manner as claimed, in particular because D2 does not even show a turn up portion of the required height. Since D2 is less relevant than D1, the prior art disclosed in D2 cannot suggest to the skilled person more than what is already covered by the combination of D1 with D5 or D6.

4.7 In the opposition proceedings the respondent relied upon a number of further prior art documents which did no longer play a role in the appeal proceedings. Since this further prior art is clearly less relevant than the material discussed above the Board sees no necessity to give a detailed commentary in respect of these documents.

4.8 The Board therefore comes to the conclusion that the subject-matter of claim 1 according to the appellant's request cannot be derived in an obvious manner from the cited prior art and accordingly involves an inventive step (Article 56 EPC). This claim, together with its dependent claims 2 to 8, the amended description and drawings as filed by the appellant during the oral proceedings therefore form a suitable basis for maintenance of the patent in amended form.

## Order

**For these reasons it is decided that:**

1. The decision under appeal is set aside.

2. The case is remitted to the first instance with the order to maintain the patent in amended form with the following documents:

   - claims 1 to 8

   - description, pages 1 to 7

   - Figures 1 to 7

   all presented during the oral proceedings of 28 September 1999.

The Registrar: The Chairman:

S. Fabiani F. Gumbel