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**Datasheet for the decision
of 19 April 2016**

Case Number: T 1994/12 - 3.3.03

Application Number: 01274630.1

Publication Number: 1460103

IPC: C08L9/00, B60C1/00, C08L91/00,
C08L95/00

Language of the proceedings: EN

Title of invention:
RUBBER COMPOSITION

Patent Proprietor:
Bridgestone Corporation

Opponent:
MICHELIN Recherche et Technique S.A.

Headword:

Relevant legal provisions:
EPC Art. 123(2), 123(3), 69(1), 84, 83, 56
EPC R. 43(1)
RPBA Art. 12(4)

Keyword:

Amendments - extension beyond the content of the application
as filed (no) - broadening of claim (no)
Claims - lack of clarity no ground for opposition
Sufficiency of disclosure - (yes)
Inventive step - (yes)
Declaration submitted with the statement grounds of appeal -
taken into account

Decisions cited:

G 0001/93, G 0003/14, G 0002/98, T 0686/91

Catchword:



Beschwerdekammern
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Case Number: T 1994/12 - 3.3.03

D E C I S I O N
of Technical Board of Appeal 3.3.03
of 19 April 2016

Appellant: MICHELIN Recherche et Technique S.A.
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Decision under appeal: **Interlocutory decision of the Opposition**
Division of the European Patent Office posted on
4 July 2012 concerning maintenance of the
European Patent No. 1460103 in amended form.

Composition of the Board:

Chairman M. C. Gordon
Members: F. Rousseau
R. Cramer

Summary of Facts and Submissions

- I. The appeal by the opponent lies against the interlocutory decision of the opposition division posted on 4 July 2012 according to which European patent No. 1 460 103 as amended according to the documents of the fifth auxiliary request submitted during the oral proceedings on 14 June 2012 met the requirements of the EPC.
- II. Claim 1 of that fifth auxiliary request, consisting of eight claims, read as follows:

"1. A rubber composition comprising:

a softening agent including a hydrogenated naphthenic oil of which hydrogenated naphthenic oil an extract quantity of dimethylsulfoxide (DMSO) by IP 346 method is controlled to less than 3% by weight, and blending at least one selected from a group of (1) a styrene-butadiene copolymer rubber with a bond styrene quantity in molecular of from 10% by weight to 60% by weight and with a vinyl bond quantity of the butadiene part of from 10% to 80% and (2) a butadiene rubber with cis bond quantity of at least 30%, wherein said softening agent further contains asphalt with up to 5% by weight of an asphaltene component and said hydrogenated naphthenic oil has at least 30% C_N of naphthenic hydrocarbon content measured in accordance with ASTM D2140."

Dependent claims 2 to 6 were directed to preferred embodiments within the ambit of that claim, whilst claims 7 and 8 were directed to a tyre tread and a pneumatic tyre using the rubber composition according to any one of claims 1 to 6, respectively.

III. In the notice of opposition the opponent requested revocation of the patent in its entirety on the grounds of lack of novelty and inventive step (Article 100(a) EPC), as well as insufficient disclosure (Article 100(b) EPC). A further opposition was submitted and subsequently withdrawn.

IV. Inter alia the following documents were referred to in the course of the opposition proceedings, whereby the numbering is that of a consolidated list provided by the respondent with the response to the statement of grounds of appeal:

D9: EP-A-0 939 104

D19: US-A-4 250 067

D20: Safe process oils for tires with low environmental impact, V. Null, Kautschuck Gummi Kunststoffe, Nr. 12/99, pages 799-805 (1999)

D21: Rubber tests with safer extender oils, V. Null, Tire Technology International '99, pages 21-25 (1999)

D23: US-A-3 247 881

D23b: GB-A-1039053

D26: Texaco Rubber Process Oils,

D27: Handbook of Plasticizers (2004), pages 28-30

D28: Nynas Data Sheets Nytex 810 (04/21/97), 820 (04/21/97), 831 (10/01/98), 240 (02/15/2001), 431 (97/06/23) and 431 (1999-04-231),

D32: JPI Standard JPI-5S-22-83

D33: IP 346/92 (2004)

D34: JPI Standard and Manuals Testing Method for Petroleum Products (as of May 2, 2011)

D35: ASTM D 6560-00

D36: ASTM D 3279-97

D37: Full Automatic Asphaltene Analyzer Model APD-600A

D40: Bitumen and oil a good combination for printing ink and rubber, Nynas Naphthenics Magazine, Research 2- 1994,

D41: Asphalt (Wikipedia) (11/04/2012)

D42: Rheology and engineering parameters of bitumen modified with polyolefines, elastomers and reactive polymers, Navarro Gonzalez Manuel, Univerlagtuberlin, Excerpts of Table of content and Chapter 2, point 2.1 (2010)

D43: Replacement of highly aromatic oils in tyres: frequently asked questions (2005), European Association of the Rubber Industry.

- V. According to the reasons of the contested decision, the amendments were based on the application as filed, reference being made to granted (sic) claims 1, 5, 6 and paragraph [9], those being considered to restrict the scope of the claims. Accordingly the requirements of Article 123(2) and (3) EPC were met. The requirements of Article 83 EPC were fulfilled, because it resulted from the amendment introduced into claim 1 that the polycyclic aromatic (PCA) content of the hydrogenated naphthenic oil had to be measured in the absence of the asphalt. Although this measurement was not carried out in the patent, it was clear for a skilled person which measures had to be applied to work within the scope of the invention. Novelty was recognised in particular over D20, D9 and D23b. As regard inventive step D9 constituted the closest prior art and the problem to be solved over D9 was to replace high aromatic softening oils by a softening oil with low PCA content without impairing rupture strength and loss characteristics. On the basis of the test results submitted by the patent proprietor with letter of 16 April 2012, and filed in a corrected version with letter of 12 June 2012 (hereafter referred to as D51),

it was acknowledged that the softening agent defined in claim 1 of the patent in suit solved that problem. The tests showed that the rubber compositions using the specific naphthenic oil and the specific asphalt component defined in claim 1 had improved fracture properties at room temperature, loss properties at 60 °C and wear resistance in comparison with rubber compositions using only the high aromatic oil of the patent in suit and the asphalt of D9 or in comparison with rubber compositions using the high aromatic oil of D9 and an asphalt component of the patent in suit. Since the prior art did not suggest to use the claimed combination of naphthenic oil and the asphalt component, an inventive step was acknowledged.

- VI. With the statement setting out the grounds for the appeal submitted with letter of 13 November 2012, the opponent submitted the following documents:
- D48: JPI-5S-45-95
D49: translation in English of D48 and
D50: affidavit of Mr. Douarre.
- VII. The respondent/patent proprietor submitted with its rejoinder of 25 March 2013 and an additional letter submitted on 19 February 2016, first to third auxiliary requests, and fourth and fifth auxiliary requests respectively.
- VIII. Additional written submissions of the patent proprietor were made with letter of 21 March 2016.
- IX. A communication dated 1 April 2016 and sent in advance by telefax on 29 March 2016 was issued by the Board in preparation of the oral proceedings.

X. Oral proceedings took place on 19 April 2016 at the end of which the decision of the Board was announced.

XI. The appellant's submissions, as far as relevant for the decision, can be summarised as follows:

(a) The experimental part of the application disclosed in the second paragraph of page 12 that the quantity of dimethylsulphoxide (DMSO) extract is measured on the whole softening agent, including the hydrogenated naphthenic oil and asphalt, in line with the information provided on page 2, first full paragraph and the indication summarized in Tables 5-1 and 5-2. Considering the existing regulations to limit the amount of carcinogenic compounds, it would not make sense for the skilled person to define the amount of those compounds only on the basis of one of the components of the softening agent. However, other passages of the application as filed disclosed that the measure was made on the hydrogenated naphthenic oil. Consequently, the insertion of the wording "hydrogenated naphthenic oil" resulting in the extract quantity of DMSO by IP 346 method controlled to less than 3% by weight to be based on the amount of hydrogenated naphthenic oil had no unambiguous basis in the application as filed. Therefore, claim 1 did not meet the requirements of Article 123(2) EPC.

(b) Contrary to the claims as granted, the amended claims allowed the use of an oil having less than 3% PCA and of an asphalt containing more than 3% PCA. Accordingly, the amended claims were in violation of Article 123(3) EPC.

- (c) The claims did not meet the requirements of Article 84 EPC, as the amendment introduced in claim 1 resulting in the amount of substances soluble in DMSO to be calculated on the amount of hydrogenated naphthenic oil did not find an unambiguous support (sic) in the application as filed.

- (d) The patent in suit did not contain a clear definition for the term "asphalt", which term as shown by documents D40, D41 and D42 could have various meanings. The patent in suit also did not define a method for measuring the asphaltene component in the asphalt, the latter being an essential feature of the invention. There existed at least two different methods in the art that provided different results as shown by documents D34 to D37 and D48/D49. Hence, the specification did not allow the skilled person to reproduce the examples of the patent in suit and thus to perform the invention. The appellant further considered that lack of sufficiency also arose because the skilled person could not, in a commercially available oil containing asphalt (so-called "black oils"), distinguish the amount of asphaltene components originating from the asphalt from that originating from the oil.

- (e) Novelty was acknowledged.

- (f) Regarding inventive step, the claimed subject-matter was obvious starting from any of D23b, D19 or D9.

- (g) Regarding D9, oil 4 used in that document was as shown by of D26 and D27 a hydrogenated naphthenic

oil corresponding to oil D used in the examples of the patent in suit. The amount of asphaltene defined in D9 was based on the total amount of softening agent, i.e. asphalt and processing oil. The amount of asphaltene of 1% disclosed in example 6 of D9 that was based on the total amount of asphalt and processing oil had to be read in combination with the information provided in paragraph [18] of D9, according to which the amount of the asphalt to be added to the processing oil was preferably 8 to 40% by weight based on the amount of the processing oil. Said range of asphalt added corresponded to a content of asphaltene in the asphalt from 14 to 3.4 wt %. Hence, the amount of asphaltene component in the asphalt defined in operative claim 1 of up to 5 wt% did not represent a distinguishing feature over the disclosure of D9.

- (h) Concerning the comparative tests D51, Runs (i) and (v) could not represent rubber compositions according to D9, as it could not be concluded that the oil used in these runs corresponded to that used in D9. In addition, a comparison of (i) and (ii) or a comparison of (v) and (vi) did not show the benefit alleged by the respondent. Whereas a comparison between (i) and (ii) showed that only the wear resistance was improved by the choice of the asphalt according to operative claim 1, a comparison of runs (v) and (vi) showed that it was in fact only the wet skid property that was improved by that feature. Moreover, runs (iii) and (iv) could not be compared to run (i) for the purpose of demonstrating the existence of an effect arising from the distinguishing features as (iii) and (iv) differed from run (i) in more than one feature.

- (i) Furthermore, the obviousness of using the asphalt and the oil of operative claim 1 had to be assessed separately, as no synergism between those features had been demonstrated. In particular, the partial problem solved over D9 was the provision of an alternative to the oil used in D9. The skilled person searching for an alternative would consider prior art documents D26 and D28 which taught the use of hydrogenated naphthenic oils. If the use of the asphalt of operative claim 1 were considered to represent a distinguishing feature, the partial problem solved thereby was the provision of an alternative to the asphalt of D9, whereby the use of those asphalts was suggested by D23 and D23b.

- (j) Even if one considered the comparisons between run (ii) and runs (iii) and (iv) or that between run (vi) and runs (vii) and (viii), the problem solved would be the mere achievement of a compromise between wear resistance, fuel consumption, fracturing property and wet skid properties. The use of the oil according to operative claim 1 would be suggested by D20, in particular its figure 2.

- (k) Furthermore, as indicated in declaration D50, the amount of asphalt or oil per 100 parts by weight of elastomer in the claimed composition could be as high as 190 parts by weight, which could not solve the problem allegedly solved over D9, as those compositions could not be fabricated and therefore not be used for manufacturing a tread. Accordingly, the problem allegedly solved over D9 could not be successfully solved over the whole breadth of claim 1.

(1) Accordingly, an inventive step had to be denied.

XII. The respondent's submissions, as far as relevant for the decision, can be summarised as follows:

(a) The subject-matter of amended claim 1 was based on a combination of original claims 1, 5 and 6 with the additional clarification that the quantity of DMSO extract was on the basis of the hydrogenated naphthenic oil. This clarification was in line with the consistent teaching provided in the application as filed and the knowledge of the skilled person concerning this method as shown by D33.

Accordingly, the appellant's objections under Article 84 and 83 EPC that were based on the same argument, according to which the skilled person understood that the quantity of DMSO extract was measured on the whole softening agent, i.e. not only on the hydrogenated naphthenic oil, but also including the asphalt, could not convince either. Moreover, the term asphalt was well known in the art as shown by D32. According to paragraph [28] of the patent in suit, the asphaltene content of the asphalt was measured in accordance with the JPI method, meaning that the skilled person would understand that the asphaltene content was determined according to the method described in D32 specifically directed to asphalts, and not according to the method described in D49 which was directed towards crude oils and petroleum products. In any case, the appellant had not proven that these two methods yielded different results. The invention was therefore sufficiently disclosed.

(b) As regard inventive step, the closest prior art was D9. The ring analysis of hydrogenated naphthenic

oils disclosed in D20 and D21 showed that aromatic oils 1 to 5 exemplified in D9 were not hydrogenated naphthenic oils. As regards the content of asphaltene, there was no disclosure in D9 for applying the content of 1% of asphaltene in the softening agent of example 6 to the general teaching of the ratio of oil to asphalt disclosed in paragraph [18] of that prior art. More importantly, all examples of D9 used an asphalt component comprising 10% of asphaltene. Thus, the rubber compositions of operative claim 1 differed from those of the prior art by the use of a different asphalt and a different oil component. Having regard to the disclosure of D9, the technical problem solved by the subject-matter of claim 1 was the provision of rubber compositions which when used for pneumatic tyres lead to higher wear resistance and lower fuel consumption, without adversely affecting fracturing property and wet skid properties. Evidence that this problem was effectively solved had been provided with experimental report D51 which provided a fair comparison with D9, whereby the comparative examples representing D9 did not use an oil identical to oil 4 of D9, but an oil within the scope of that described in D9. None of the cited documents taught to use the asphaltene content required by operative claim 1, let alone in combination with a hydrogenated naphthenic oil as defined in said claim 1, in order to solve said problem. Accordingly, an inventive step was to be acknowledged.

XIII. The appellant (opponent) requested that the decision under appeal be set aside and that the patent be revoked.

XIV. The respondent (patent proprietor) requested that the appeal be dismissed, or alternatively that the decision under appeal be set aside and that the patent be maintained in amended form on the basis of the claims of one of the first to third auxiliary requests, filed with the letter of 25 March 2013, or on the basis of the fourth or fifth auxiliary request filed with the letter of 19 February 2016. It also requested that document D50 not be admitted into the proceedings.

Reasons for the Decision

Main Request

Amendments

1. Article 123(2) EPC

1.1 The subject-matter of claim 1 results from the combination of original claims 1, 5 and 6 and the insertion of the wording "hydrogenated naphthenic oil" resulting in the clarification that it is the hydrogenated naphthenic oil of which the extract quantity of dimethylsulphoxide (hereafter DMSO) by IP 346 method is controlled to less than 3% by weight. The objection raised by the appellant with respect to Article 123(2) EPC concerns only the latter modification. The appellant is of the opinion that such clarification cannot be deduced in an unambiguous way from the application documents as filed, in particular when taking into consideration the existing regulatory limitations on the amount of carcinogenic compounds, in view of which it would not make sense to define the

amount of these compounds on the basis of only one of the compounds of the softening agent.

- 1.2 It is not disputed by the parties that it is conventional knowledge in the art that IP 346 is a standardized test method applicable to the range of process oils used in the tyre industry. Those oils are subject to regulatory requirements to contain less than 3 % by weight of substances soluble in dimethylsulphoxide (DMSO), which substances include polycyclic aromatic (PCA) compounds, known to be carcinogenic (see D43 - page 1, last line , D28 - last page, point 16, D21 - page 22, right-hand column and page 23, right-hand column - as well as D20 - page 800, middle- and right-hand columns and page 802, left-hand column).
- 1.3 The requirement to use process oils which contain less than 3 % by weight of PCA, i.e. substances soluble in DMSO is reflected on page 1, second paragraph of the application as filed (all passages of the application as filed indicated in the decision refer to the translation of the international application submitted on 7 April 2003). According to the information provided in the second complete paragraph of page 2, the second paragraph of page 4 and at page 6, lines 3-7 of the application as filed, there is no ambiguity that the upper limit of 3 % by weight of substances soluble in DMSO applies to the hydrogenated naphthenic oil and not to the softening agent in its entirety. This is also confirmed at page 10 under point (2) and in Table 1 on page 13 of the application as filed concerning the experimental part of the application, wherein the amount of polycyclic aromatic compounds is indicated to represent a property of the hydrogenated naphthenic

oil, as are the kinetic viscosity, aniline point, and C_A , C_N and C_P contents.

1.4 It is recognised that Tables 5-1 and 5-2 indicate the amount of PCA component in the softening agent. This, however, does not necessarily mean that the amount indicated in those tables is the result of a measurement carried out on the softening agent comprising the mixture of hydrogenated naphthenic oil and asphalt, as no explicit statement in this respect can be found in the application as filed and the amount of PCA component might have been merely computed based on the amount of PCA component in the oil component measured and indicated in Table 1 and the quantities of oil and asphalt used for preparing the softening agent. Therefore, the skilled reader of the application as filed cannot infer from the disclosure of the examples indicated in Tables 5-1 and 5-2 that the amount of 3 % by weight indicated in claim 1 as filed is based on the amount of softening agent. Moreover, the skilled person is aware, as shown in the documentation concerning IP 346 (D33), that this test method is to be employed for unused lubricating base oils and to other asphaltene-free petroleum fractions (see page 1, first and second paragraphs of the left-hand column). Therefore, the description of the test method IP 346 itself does not lead the skilled person to conclude that said test method is meant - in the application as filed - to be applied to the whole softening agent, which can contain non-negligible amounts of asphaltene.

1.5 Consequently, the skilled reader, contrary to the appellant's opinion has no reason to consider that the data summarized in Tables 5-1 and 5-2 are in contradiction with the unambiguous indication in the application as filed referred to above in paragraph 1.3

that the limitation of the extract quantity of DMSO by IP 346 method to less than 3% by weight refers to the amount of extract contained in the "hydrogenated naphthenic oil". Hence, the clarification made in claim 1 in that respect does not extend beyond the content of the application as filed with the consequence that the appellant's objection with respect to Article 123(2) EPC fails.

2. Article 123(3) EPC

2.1 Article 123(3) EPC precludes amending the claims during opposition proceedings in such a way as to extend the protection conferred by the patent as granted. The protection conferred by the patent as granted is, according to the established case law of the Boards of Appeal (see in particular G 1/93, point 11 of the reasons), assessed taking into account the provisions of Article 69(1) EPC and the protocol on its interpretation.

2.2 The passages of the specification of the patent in suit that correspond to the passages of the application as filed mentioned above, i.e. paragraphs 5, 9 and 14 and passages at page 4, lines 36-54 and at page 5, table 1 of the specification, establish that the protection conferred by claim 1 of the patent in suit included the compositions as defined in claim 1 of the main request in which the feature that the extract quantity of DMSO by IP 346 method was controlled to less than 3% by weight referred to the amount of extract contained in the hydrogenated naphthenic oil. Thus, in these circumstances, the objection of the appellant that the limit of 3% was now defined to be based on the amount of hydrogenated naphthenic oil and not on the overall

amount of softening agent would be in breach of Article 123(3) EPC must also fail.

3. Clarity

The appellant objects that the claims do not meet the requirements of Article 84 EPC because the amendment introduced in claim 1 that defines that the amount of substances soluble in DMSO refers to the amount contained in the hydrogenated naphthenic oil does not find an unambiguous support (sic) in the application as filed. That argument refers to the question whether the application as filed provides an unambiguous disclosure for the clarification introduced into claim 1, but not whether claim 1 is supported by the description within the meaning of Article 84 EPC. Concerning the use of the terminology "support" reference is made to point 2 of the decision G 1/03 of the Enlarged Board of Appeal. Hence, the appellant's objection is in fact an objection under Article 123(2) EPC, the assessment of which is given in above point 1. The Board has therefore no reason to consider that the subject-matter of the operative claim 1 does not meet the requirement of Article 84 EPC.

4. Sufficiency of disclosure

4.1 It is the appellant's argument that, owing to the absence of any clear definition of the term "asphalt" and the absence of any indication of a method for measuring content of the asphaltene component in the asphalt that is an essential feature of the invention, the skilled person would not be able to reproduce the examples of the patent in suit and perform the invention. The appellant further considers that lack of sufficiency also arises because the skilled person

could not distinguish the amount of asphaltene components originating from the asphalt from the amount originating from the oil.

4.2 As for novelty and inventive step, assessment of sufficiency of disclosure of the invention is made for the invention for which protection is sought, i.e. as defined by the claims in terms of the technical features of the invention (see Rule 43(1) EPC). Thus, the question to be answered is whether the patent in suit provides sufficient information which enables the skilled person to perform the invention as defined in the claims in terms of the technical features of the invention, throughout the whole area claimed, taking into account common general knowledge. This means in the present case examining whether the patent in suit makes available to a person skilled in the art the combination of features defining the rubber composition of claim 1.

4.3 It is not disputed that asphalts are conventional ingredients used in the preparation of rubber compositions. It is also not contested that at the date of filing of the application conventional methods existed to measure the content of asphaltene components in asphalt and that those methods by gravimetry (D32) or spectrophotometry (D49) might provide different results. Nor is it disputed that the skilled person would be able, by applying any of the methods described in D32 or D49, to find an asphalt comprising up to 5% by weight of an asphaltene component. Finally, it is not disputed that methods for introducing those compounds into a rubber of the type defined in claim 1 were also known to the skilled practitioner.

4.4 The point made by the appellant with regard to its central argument for demonstrating a lack of sufficiency of disclosure that the skilled person would not be able to reproduce the examples of the patent in suit, because the definition of the asphalt to be used, including its content of asphaltene, is ambiguous does not relate to the ability to prepare rubber compositions in accordance with the terms of the claims. It rather boils down to the argument that the boundaries of the claims of which asphalt with up to 5% by weight of an asphaltene component is a feature are not clearly defined. Such an alleged ambiguity regarding the limits of a claim is however a matter of Article 84 EPC, not sufficiency of disclosure. Such an objection under Article 84 EPC cannot be successful as it would not arise out of any amendment made in opposition or appeal proceedings (G 3/14).

4.5 As to the argument that the requirement for sufficiency of disclosure is not met because the skilled person in view of the ambiguity in respect of the nature of the asphalt would not be able to reproduce the examples of the patent in suit, the following is to be said. Sufficiency of disclosure is not concerned with the invention the applicant might have had in mind when drafting the application, but rather with the invention which is defined by the claims in terms of the technical features of the invention (see Rule 43(1) EPC), as is done for assessing other criteria for patentability such as novelty and inventive step (cf section 4.2, above). In other words, the issue of sufficiency of disclosure does not solely (emphasis added by the Board) depend on whether or not it can be established exactly which asphalt component the applicant had in mind when drafting the application, in particular when providing a description

of the examples. To do this would require clarifying which asphalt component had been meant or intended, which in turn would possibly require the specification of the method to determine the amount of asphaltene and a more specific definition of the term "asphalt". What is required by Article 83 EPC, however, is that the invention as defined by the claims (see section 4.2 above), i.e. in the present case with the definition of the asphalt component as it stands is sufficiently disclosed on the basis of the information provided in the patent as a whole, taking into account common general knowledge. Such a - less restrictive - reading of the feature "asphalt" (compared to what kind of asphalt the applicant might have meant but did not describe) resulting in a larger number of rubber compositions possibly meeting the definition of claim 1 would appear on the one hand to result in less difficulty for a skilled person to obtain the rubber compositions as defined by the claims, i.e. less stringent requirements when it comes to assessing sufficiency of disclosure of the claimed combination of features. On the other hand, it requires stronger arguments in favour of novelty and inventive step, if these - now more broadly defined - asphalt components are to be held to distinguish the claimed subject-matter from the prior art and should then be considered essential for providing a technical effect vis-à-vis the prior art.

- 4.6 As to the additional argument of the appellant in support of the objection of lack of sufficiency of disclosure, it is noted that claim 1 does not require that the skilled person starting from a given rubber composition be able to distinguish the amount of asphaltene components originating from the asphalt from that originating from the oil. This might be at most a

question relating to infringement, but as far as patentability and sufficiency of disclosure is concerned, it is only required that the skilled person is able to prepare the compositions defined in the present claims.

4.7 Consequently, it is concluded from the above that the requirements for sufficiency of disclosure are met.

5. Novelty

Novelty was not contested and the Board has no reason to take a different view.

6. Inventive step

Closest state of the art

6.1 The closest prior art for the purpose of objectively assessing inventive step is generally that which corresponds to a purpose or effect similar to that of the invention and requiring the minimum of structural and functional modifications (Case Law of the Boards of Appeal of the European Patent Office, 8th edition, 2016, I.D.3.1). It is normally a document that mentions the purpose or objective indicated in the patent in suit as a goal worth achieving (*supra*, I.D.3.2).

6.2 Having regard to the section "Background art" of the patent in suit (paragraphs [2] and [3]), as well to the section "Summary of the invention" (paragraph [4]), the starting point for the claimed invention concerned rubber compositions for pneumatic tyres comprising a substitute for known aromatic process oils, which substitute process oils comprised less than 3 % by weight of PCA compounds, such as Treated Distilled

Aromatic Extracts (T-DAE) or Mild Extracted Solvates (MES). According to the same passages rubber compositions comprising these substitute oils exhibited (implicitly in comparison to the compositions comprising an aromatic process oil) a decreased wet skid performance expressed as $\tan \delta$ at 0°C. The reason for searching for a substitute process oil in the "late years" as indicated in paragraph [2] was known to the skilled person as indicated in above point 1.2, i.e. process oils becoming subject to regulatory requirements to contain less than 3 % by weight of substances soluble in DMSO. Accordingly, the aim of the present invention was, as indicated in paragraph [4] of the specification, to provide a rubber composition particularly for preparing pneumatic tyres comprising a specific softening agent that contained less than 3 % by weight of PCA components and in addition with equivalent or superior rupture strength (fracture property) and good characteristics (dynamic loss property) as compared to aromatic oils.

- 6.3 The appellant submitted D23b, D19 or D9 as starting point for assessing inventive step. D23b concerns the use of highly aromatic oils and therefore implicitly concerns the use of process oils containing more than 3 % by weight of substances soluble in DMSO as substitute process oils. In view of the paramount requirement of using process oils that contain less than 3 % by weight of substances soluble in DMSO, the skilled person could not realistically start from the disclosure of D23b when seeking to solve the problem mentioned above, namely to find a substitute for aromatic process oils for the preparation of rubber compositions for tyres, while avoiding a decrease of the wet skid performance. He would also not start from D19 because this document does not relate to rubber

compositions for tyres. Starting from one of these documents as the closest prior art, purely in view of structural similarities, can only be done on the basis of *ex post facto* considerations. A document not mentioning a technical problem that is at least related to that derivable from the patent specification, does not normally qualify as a description of the closest state of the art on the basis of which the inventive step is to be assessed, regardless of the number of technical features it may have in common with the subject-matter of the patent concerned (*supra*, I.D.3.3, in particular T 686/91).

6.4 D9, however, relates as does the patent in suit to rubber compositions for tyres (paragraph [27]) containing a process oil which comprises an amount of PCA compounds of less than 3 % by weight (see paragraph [13] and Table 1 in paragraph [41]). Furthermore, D9 also discloses, in particular in its examples, that the rubber compositions provide excellent high-loss properties at room and low temperature, as well as good fracture properties. Accordingly, D9 is to be taken as the closest prior art and therefore starting point for assessing inventive step.

6.5 Analysis of the closest prior art with regard to the type of processing oils disclosed:

6.5.1 The appellant considers based on references D26 and D27 that Oil 4 used in D9 and disclosed in Table 1 is a hydrogenated naphthenic oil, more specifically an oil corresponding to oil D used in the examples of the patent in suit, contrary to the definition of that oil in the same table where it is described as aromatic oil.

- 6.5.2 The nature of the oils disclosed in Table 1 of D9 is first to be analysed in the context of that document, i.e. having regard to its whole disclosure. The processing oil to be used in D9 is according to paragraph [15] a high aromatic oil, a naphthenic oil, a paraffinic oil, used alone or in combination, high aromatic oils being preferred in view of their high percentage of aromatic carbon content and their ability to provide rubber compositions with a "high high-loss property" (sic).
- 6.5.3 According to paragraphs [10] and [11] "the softening agent preferably has a %C_A of 18 or more, more preferably 23 or more and most preferably 25 or more when measured by the ring analysis" and "When %C_A is less than 18, the high-loss property is occasionally not sufficiently exhibited". The results summarized in Tables 3A and 3B concern the use of Oils 1 to 5 labelled "High Aromatic Oils" in Table 1, for which the high-loss properties are judged "excellent" when the aromatic content is 24 or 26% (oils 1, 4 and 5) or "fair" when the content is 18 or 22% (oils 2 and 3), confirming in view of the above results that the oils 1 to 5 of Table 1 are meant according to D9 to be "high aromatic oils" within the meaning of D9 and not naphthenic or paraffinic oils as also listed in paragraph [15].
- 6.5.4 Furthermore, as shown by D20 the treatment of distillate aromatic extracts results in an increase of the aniline point, reduction of the PCA content and decrease of the proportion of the aromatic carbons (page 800, Table 1 and middle-column), which properties agree well with the data provided in Table 1 of D9. Accordingly, it cannot be concluded as advanced by the appellant on the basis of the sole documents D26 and

D27 that the oil 4 of D9 in view of its aniline point and carbon atom distribution (aromatic, naphthenic and paraffinic) indicated in Table 1 is necessarily a hydrogenated naphthenic oil. Accordingly, the hydrogenated naphthenic oil defined in operative claim 1 constitutes a distinguishing feature over the disclosure of D9.

6.6 Analysis of D9 with regard to the type of asphalt disclosed:

6.6.1 According to claim 1 and paragraph [9] of D9, the softening agent contains 0.1 to 4% by weight of asphaltene. According to paragraphs [7], [14] and [41] of D9, the asphalt and processing oils are mixed together to form a softening agent. The amount of asphaltene defined in D9 is based on the total amount of softening agent, i.e. asphalt and processing oil, as argued by the appellant. Based on the amount of asphaltene of 1% by weight disclosed in example 6 of D9 that is based on the total amount of asphalt and processing oil, the appellant argues that this amount can be read in combination with the information provided in paragraph [18] of D9 that the amount of the asphalt to be added to the processing oil is preferably 8 to 40% by weight based on the amount of the processing oil. This leads according to the appellant to the conclusion that for an amount of asphaltene of 1% by weight, as disclosed in certain examples of D9, the amount of asphalt added from 8 to 40% by weight, corresponds to a content of asphaltene in the asphalt from 14% by weight (when the amount of asphalt added is 8% by weight) to 3.4% by weight (when the amount of asphalt added is 40% by weight). Based on this value of 3.4% by weight the appellant concludes that the amount of asphaltene component in the asphalt defined in

operative claim 1 of up to 5% by weight does not represent a distinguishing feature.

6.6.2 An explicit disclosure in D9 for an amount of asphaltene component in the asphalt lying in the range of operative claim 1, i.e. up to 5% by weight was not indicated. In fact, the only value explicitly defined in D9 is 10% by weight in the context of the examples of D9, i.e. for a specific asphalt and therefore a specific rubber composition. In addition, there is no disclosure in D9 that the examples should be modified in such a manner that the amount of asphaltene based on the amount of softening agent remains constant (i.e. at a value of 1%), while varying the amount of asphalt added, specifically in the range of 8 to 40% by weight indicated in paragraph [18]. It is conspicuous to the Board that the amount of asphaltene based on the total weight of the softening agent is disclosed in paragraph [9] to be comprised between 0.1 and 4% by weight and therefore is not disclosed to the skilled reader to have a fixed value. Accordingly, combining the highest value of asphalt added disclosed in D9, while keeping the amount of asphaltene of the examples constant is the result of an artificial reading of D9, for which the document provides no basis. Indeed such a construction of the disclosure of D9 can only be the result of reading D9 in the light of operative claim 1 and attempting, *ex post facto* to mould the disclosure of D9 to arrive at something corresponding to the subject-matter of said claim. Such an *ex post facto* reading of D9 does not constitute an objective assessment of the disclosure of D9 and consequently is not allowable.

6.6.3 Accordingly, an asphalt with up to 5% by weight of an asphaltene component also constitutes a distinguishing feature over the disclosure of D9.

Problem successfully solved

6.7 Having regard to the disclosure of D9, the respondent submitted that the technical problem solved by the subject-matter of claim 1 was the provision of rubber compositions which when used for pneumatic tyres result in higher wear resistance and lower fuel consumption, without adversely affecting fracturing property and wet skid properties.

6.8 As to whether evidence has been provided that the claimed subject-matter provides a successful solution to the above problem, the respondent referred to D51. D51 provides a comparison of a rubber composition (i) indicated to represent the closest prior art with two rubber compositions (iii) and (iv) representing embodiments of operative claim 1. Runs (iii) and (iv) differ from run (i) only in that the oil and the asphalt used in run (i) have been replaced by an oil and an asphalt both in accordance with operative claim 1. A similar comparison is also provided in D51 between a rubber composition (v) intended to correspond to the closest prior art and two rubber compositions (vi) and (vii) representing embodiments of operative claim 1. The runs (v), (vii) and (viii) are identical to those of (i), (iii) and (iv) respectively, but use a different rubber.

6.9 It was disputed by the appellant that runs (i) or (v) of D51 represent the closest prior art, as it was not known whether the oil or asphalt employed in those runs correspond to those used in D9. Having regard to the

aniline point (74.4 °C), the distribution of aromatic, naphthenic and paraffinic carbon atom (%C_A: 25.6%, %C_N: 28.6% and %C_P: 45.3%) and the amount of PCA component below 3% of the oil used in runs (i) and (v), which properties are very close to those of oil 1 employed in D9 (aniline point: 76 °C, %C_A: 26.0%, %C_N: 28.0% %C_P: 46.0% and amount of PCA component 2.5%), the Board considers it credible, in line with the declaration by the patent proprietor in D51, that the oil used in runs (i) and (v) is an oil according to the teaching of D9. In addition, the Board is satisfied that the 60-80 straight asphalt as used in said runs (i) and (v) is the preferred asphalt according to the teaching of D9, as can be seen in paragraphs [16] and [17] of that document, wherein the asphalt is stated to be preferably a straight asphalt and has a penetration most preferably in the range of 60 to 80. The Board therefore concludes that runs (i) and (v) of D51 can be considered as comparative examples which reflect the closest prior art.

- 6.10 In the case where comparative tests are chosen to demonstrate an inventive step with an improved effect over a claimed area, the nature of the comparison with the closest state of the art must be such that the effect is convincingly shown to have its origin in the characterizing features of the invention (following T 197/86, reasons 6.1.3.)
- 6.10.1 As demonstrated by a comparison between run (v) of D51, representing the teaching of D9 and runs (vii) and (viii) the replacement of the softening agent of D9, i.e. the combination of oil and asphalt, by the oil and asphalt according to operative claim 1, brings about a significant improvement in wear resistance and a small decrease of fuel consumption, without adversely

affecting fracturing property and wet skid properties. The same trend is observed when comparing run (i) representing the teaching of D9 and runs (iii) and (iv), whereas in that case fracturing properties are even improved. Under these conditions, the comparative tests D51 show the existence of a causal link between the problem alleged to have been solved over the closest prior art D9 and the modification of softening agent from the one used in D9 to that defined in operative claim 1.

6.10.2 It was argued by the appellant that the comparisons provided in D51 within each of the sets of data (i), (iii) and (iv) and (v), (vii) and (viii) were not suitable to demonstrate an improved effect over D9, as these data did not demonstrate that the replacement of the asphalt of D9 by the asphalt of operative claim 1 brought about any technical effect when an oil according to operative claim 1 was used. The Board does not share the appellant's view. The purpose of the comparative tests D51 is to demonstrate a causal link between the modification of the closest prior art and the technical effect alleged to have been brought about by said modification. In the present case it is not necessary to demonstrate an improved effect over a rubber composition comprising an oil of the invention and an asphalt of D9, as such combination does reflect the closest prior art, let alone another prior art teaching pursuant to Article 54(2) EPC cited in these proceedings.

6.11 The Board is therefore satisfied in the absence of evidence to the contrary that the problem as formulated by the respondent is successfully solved by the subject-matter of claim 1.

Obviousness

- 6.12 It remains to be decided whether the proposed solution to the objective problem underlying the patent in suit is obvious in view of the state of the art.
- 6.12.1 D9 does not concern naphthenic oils having %C_N of at least 30 and as shown above has not been shown to disclose hydrogenated naphthenic oils. It also does not concern asphalt having an asphaltene content of up to 5 wt%. Therefore it cannot lead to the claimed solution.
- 6.12.2 D20 is an article concerning the replacement of aromatic oils (distillate aromatic extracts - DAE) known to comprise high levels of polycyclic aromatic compounds (page 799, middle column) by process oils containing less than 3% by weight of polycyclic aromatic compounds such as treated distillate aromatic extracts (TDAE), MES and naphthenic process oils (NAP) made from corresponding paraffinic or naphthenic distillates, either via solvent extraction or hydrotreating (D20 page 800 middle and righthand columns). An example of a hydrogenated naphthenic oil having at least 30% C_N of naphthenic hydrocarbon content, namely 43, is indicated in the third entry Table 1 of D20 ("NAP"). The influence of different process oil types on the performance of tyre treads was studied and reported in D20, in particular in Figure 2 presenting results for tear resistance and DIN abrasion, $\tan \delta$ (60°C), $\tan \delta$ (0°C) and mechanical properties such as tensile strength. Figure 2 and the comments of the results concerning $\tan \delta$ (60°C), i.e. rolling resistance which property is indicated to be directly correlated with fuel consumption, (page 803, middle column) teach the skilled person that all substitute oils tested exhibit a comparable level of

tan δ (60°C) (page 804, left-hand column, lines 7-9). In addition, the values reported in Figure 2 for tear resistance and DIN abrasion do not suggest that the use of hydrogenated naphthenic oils would provide any advantages in respect of wear resistance. A similar teaching is provided by D21 (page 24, Figure 1 and paragraph bridging middle and right-hand column for tan δ (60°C) and page 24, middle column, first full paragraph). Moreover, neither D20 nor D21 suggests the use of an asphalt having an asphaltene content of up to 5 wt%.

6.12.3 The other documents concerning substitutes for aromatic oils, in particular hydrogenated naphthenic oils, cited by the appellants, i.e. D26 to D28, do not indicate the influence of these oils when used in the fabrication of tyre treads.

6.12.4 D19 concerns rubber compositions comprising a hydrogenated naphthenic oil and an asphalt useful in the preparation of products such as rubberized asphaltic concrete, mastics, sealants, pipeline coatings, roofings, insulation materials and speciality rubber. This document does not concern the manufacture of tyre treads, let alone the influence of substitutes for aromatic oils on wear resistance and fuel consumption.

6.12.5 Documents D23 and D23b which disclose the use of asphalt having an asphaltene content preferably less than 7% for making a tyre tread are not concerned with substitutes for aromatic oils, the latter being used. Those documents are silent on wear resistance and fuel consumption.

- 6.12.6 Accordingly, the skilled person would have not found in the cited documents any indication that the use of either a hydrogenated naphthenic oil or an asphalt component as defined in operative claim 1 would contribute to achieve the sought improvement of wear resistance and fuel consumption, without adversely affecting fracturing property and wet skid properties.
- 6.13 Consequently, the use of a hydrogenated naphthenic oil according to operative claim 1 in order to solve the problem mentioned in above point 6.7 was not obvious to the skilled person, let alone in combination with the specific asphalt defined in operative claim 1.
- 6.14 The appellant submitted further arguments against the existence of an inventive step, which arguments are dealt with in this part of the decision in order to facilitate its reading:
- 6.14.1 The appellant argued that the data of D51 did not show the existence of a synergism resulting from the combined use of the oil and the asphalt defined in claim 1, with the consequences that the problem solved over D9 could only be formulated as the provision of an alternative. The question as to whether a synergism exists is of relevance when two compounds known to have the same technical effect are used in combination and it is argued for inventive step that they achieve in combination a technical success over and above the sum of their respective known individual contributions. It means that the question of the existence of a synergism might become decisive for deciding the issue of inventive step when the use of each of the compounds separately for providing that effect over the closest prior art was obvious to the skilled person. In the present case, the technical effect meant to be solved

over D9 is an improvement in wear resistance and fuel consumption, without adversely affecting fracturing property and wet skid properties (see point 6.7 above). That effect has been credibly demonstrated to have been attained by D51, as indicated above. Since none of the prior art documents cited suggest that the naphthenic oil and the asphalt according to claim 1 would bring about those effects either individually or in combination, the question of the existence of a synergism between the naphthenic oil and the asphalt according to claim 1 is of no relevance for the present decision.

6.14.2 Furthermore, the mere allegation by the appellant of the existence of partial problems within the meaning of the Case Law that are individually solved by the use of an asphalt and an oil according to operative claim 1 cannot justify as is alleged by the appellant a separate analysis of the problem solved by each of these features and the obviousness thereof in view of the prior art.

6.14.3 First of all, the invention in the European patent application is defined by the subject-matter of a claim, i.e. the specific combination of features present in the claim, as is recalled in Opinion G 2/98 of the Enlarged Board of Appeal (point 2 of the Reasons). Accordingly, the inventive character of an invention is to be judged for the claimed combination of features, including a definition of the problem solved by that combination of features. The analysis of the inventive merit of using each of the individual characteristics oil and asphalt of operative claim 1 individually as done by the appellant does not result in an objective analysis, as it prejudices the absence of interaction between those characteristics and

ignores the central issue as to whether or not the skilled person would have found the suggestion to use these features in combination. In the present case, it is conspicuous to the Board in the light of experimental report D51 that each of the properties addressed in the above formulation of the problem, i.e. wear resistance, fuel consumption, fracturing property and wet skid property, are influenced both by the type of oil (see comparison of (iii) or (iv) with (ii)) and by the type of asphalt (see comparison of (i) and (ii)). Accordingly, at least for that reason, a separate analysis of the obviousness of using the oil and the asphalt according to operative claim 1 based on the unfounded allegation of the existence merely of separate partial problems solved by each of those features individually is not appropriate and must be rejected.

6.14.4 Furthermore, based on the definition in claim 7 allowing a blending ratio of the hydrogenated naphthenic oil and the asphalt in the softening agent from 95/5 to 5/95 and on the passage in paragraph [16] of the specification indicating that the amount of softening agent would be preferably 1 to 200 parts by weight per 100 parts by weight of the rubber component, it was argued by the appellant that claim 1 allowed the use of 190 parts by weight of either hydrogenated naphthenic oil or asphalt per 100 parts of the rubber component, which compositions could not be fabricated and therefore could not be used for manufacturing a tread. Accordingly, the problem allegedly solved over D9 could not be successfully solved over the whole breadth of claim 1. That argumentation was provided with declaration D50 submitted with the statement setting out the grounds for the appeal. Independently of the relevance of that line of argumentation, it does

not constitute an illegitimate means of arguing against the finding of the opposition division with respect of the problem solved over the closest prior art. Accordingly, the Board has no reason to make use of its discretionary power under Article 12(4) RPBA and disregard that document. As to the pertinence of that line of argumentation, it is first noted that the amount of 190 parts by weight computed by the appellant results from a combination of upper numerical values of the two above ranges, which combination is neither defined in present claim 1, nor disclosed in the rest of the patent specification. Furthermore, the respondent showed that the replacement in the tread of D9 of the softening agent used therein by the softening agent according to claim 1, i.e. comprising the oil and asphalt defined therein, provided an unexpected technical benefit, which represents a technical contribution to the art justifying the granting of a patent. In that respect, a softening agent comprising the combination of asphalt and hydrogenated naphthenic oil defined in claim 1 would also be considered to be inventive for the same reasons as given above and no document of the prior art has been indicated that would disclose the combination of oil and asphalt of operative claim 1. Whether the patent proprietor decided to formulate a claim restricted to a rubber composition comprising that softening agent and not a claim directed to a softening agent is a matter of choice for the patent proprietor. Nevertheless, the patent proprietor should not be penalized for having deliberately defined a subject-matter restricted to a specific rubber composition comprising the softening agent as defined in operative claim 1. Hence, the line of argumentation submitted by the appellant based on D50 cannot lead to the conclusion that the subject-matter of claim 1 lacks an inventive step.

6.14.5 The appellant also argued that it was not the amount of asphaltene in the asphalt which was decisive, but the amount of asphaltene in the whole composition. However, as operative claim 1 did not exclude the use of more asphaltene added with other compounds as the asphalt, no effect could result from the maximum amount of asphaltene in the asphalt component defined in operative claim 1. That argument also fails to convince, because similar considerations would also apply to D9 that does not exclude that asphaltene can be added with other components than the asphalt component.

6.15 Accordingly, the subject-matter of claim 1 of the main request is considered to involve an inventive step within the meaning of Article 56 EPC. The same holds true for dependent claims 2 to 6 and claims 7 and 8 directed to a tyre tread or a pneumatic tyre with the use of the rubber composition according to claims 1 to 6.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



B. ter Heijden

M. C. Gordon

Decision electronically authenticated