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D E C I S I O N
of 31 March 1999

Case Number: T 0960/95 - 3.3.3

Application Number: 86113770.1

Publication Number: 0232463

IPC: C08L 21/00

Language of the proceedings: EN

Title of invention:

EPDM Elastomeric compositions

Patentee:

POLYSAR LIMITED

Opponent:

Exxon Chemical Patents Inc.

Headword:

-

Relevant legal provisions:

EPC Art. 99(1), 54, 56, 83
R. 36, 61a, 55, 56

Keyword:

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Decisions cited:

T 0219/83, T 0154/87, T 0289/91, T 0164/94

Catchword:

"Opposition admissible (yes) - missing signature filed within time limit set by EPO"

"Disclosure - sufficiency (yes)- sufficient information for skilled person - further improvement not necessarily related to essential feature of invention"

"Novelty (yes) - prior disclosure - no implicit features"

"Inventive step (yes) - no incentive"



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Boards of Appeal

Chambres de recours

Case Number: T 0960/95 - 3.3.3

D E C I S I O N
of the Technical Board of Appeal 3.3.3
of 31 March 1999

Appellant: Exxon Chemical Patents Inc.
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Respondent: POLYSAR LIMITED
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Decision under appeal: Interlocutory decision of the Opposition Division
of the European Patent Office posted
4 october 1995 concerning maintenance of European
patent No. 0 232 463 in amended form.

Composition of the Board:

Chairman: C. Gérardin
Members: B. ter Laan
A. Lindqvist

Summary of Facts and Submissions

- I. Mention of the grant of European patent No. 0 232 463 in respect of European patent application No. 86 113 770.1, filed on 4 October 1986 and claiming priority from an earlier application in the USA (810 770 of 19 December 1985), was published on 30 December 1992, on the basis of eleven claims, Claim 1 reading:

"An elastomeric polymer composition comprising, as the sole polymeric elastomer components, at least one highly unsaturated rubbery polymer and 25 to 50 parts by weight per 100 parts by weight of total elastomers of a high molecular weight EPDM polymer having a bound non-conjugated diene content of from 6 to 15 weight percent of the EPDM, a Mooney viscosity (ML 1+8 at 100°C) of greater than 150 and an ethylene:propylene weight ratio of from 50:50 to 75:25."

Claims 2 to 8 were directed to preferred embodiments of Claim 1. Claim 9 referred to a vulcanizate of the composition of Claim 5 and Claims 10 and 11 to pneumatic tyres containing vulcanizates of the compositions of Claim 9 and Claim 7, respectively.

- II. On 30 September 1993 a Notice of Opposition was filed and revocation of the granted patent in its entirety was requested under Article 100(a) EPC. The objection was initially based upon four documents (D1 to D4), to which a Declaration by Prof. E. Andrews and six further documents (D5 to D10) were added later. During the oral proceedings before the first instance the Opponent additionally raised an objection pursuant to

Article 100(b) EPC.

III. In response to the opposition, the Proprietor, apart from the substantive issues, argued that the opposition was inadmissible pursuant to Rule 99(1) EPC, since neither the original Notice of Opposition nor the confirmation copy bore the Opponent's signature.

IV. By an interlocutory decision delivered orally on 6 July 1995 and issued in writing on 4 October 1995, the Opposition Division held that the opposition was admissible, but that there were no grounds of opposition prejudicing the maintenance of the patent in amended form, i.e. on the basis of a set of nine claims filed as auxiliary request on 6 July 1995, the amendments in Claim 1 being:

- (i) the amount of highly unsaturated rubbery polymer was now 30 to 45 parts by weight per 100 parts by weight of total elastomers,
- (ii) the EPDM rubber was now defined as an oil extended EPDM polymer containing 50 to 150 parts by weight per 100 parts by weight of EPDM polymer of naphthenic or paraffinic oil.
- (iii) The Mooney viscosity of the EPDM was now indicated to be measured prior to oil extension.

Claims 2 and 3 as granted were deleted and the other claims were renumbered and their appendancies adjusted.

The Opposition Division held that

- (a) The opposition complied with Articles 99 and 100 in conjunction with Rules 1(1) and 55 EPC; the late filing of the signature was acceptable pursuant to Rule 36(3) EPC. Hence the opposition was admissible.
- (b) The requirements of Article 123(2) and (3) EPC were fulfilled.
- (c) The invention was disclosed sufficiently clearly and completely for the skilled person to carry it out.
- (d) None of the cited documents disclosed an elastomeric composition according to Claim 1, so that novelty was accepted. In particular D6 (Shulman, C.B. "unique features of high unsaturation EPDM polymers" ACS 128th Rubber Division Meeting, October 1-4, 1985) did not mention the EPDM/rubber ratio of 30 to 45 parts by weight per 100 parts by weight of total elastomers.
- (e) Regarding inventive step, the problem to be solved was to provide elastomer compositions having good resilience, ozone resistance and fatigue life after vulcanization, as well as good cured adhesion to adjacent rubber compounds, as stated in the patent specification. As could be seen from the examples, it was effectively solved. D6 did not refer to that problem and hence could not be considered as an appropriate starting document for the problem-solution approach. Even if one started from D6, it was not obvious to arrive at the

present elastomeric composition in view of the differences between D6 and the opposed patent. None of the other cited documents, either alone or in combination, would lead to the claimed subject-matter in an obvious way. Therefore, the presence of an inventive step was acknowledged.

- V. On 1 December 1995 the Appellant (Opponent) lodged an appeal against the above decision and paid the prescribed fee. The Statement of Grounds of Appeal was filed on 5 February 1996.

In that statement and in a later submission the Appellant, argued essentially as follows:

- (a) The opposition was admissible since the procedure followed for filing the initially omitted signature was in accordance with Rule 36(3)(5) EPC.
- (b) The issue of sufficiency of disclosure was now raised from a different viewpoint based on the experimental data presented by the Respondent; it could be seen that intensive mixing was an essential part of the invention, which was not derivable from the patent in suit.
- (c) The disclosure of D6 was not limited to the EPDM/total elastomer ratio explicitly mentioned. According to D6 the described properties were better at a blend ratio of less than 50:50, which also implied the range now claimed, so that this range was not novel.

(d) Regarding inventive step, the Proprietor's allegation that the EPDM/total elastomer range now claimed resulted in unexpected adhesive properties of the blend was not in accordance with the evidence on file, which showed that the adhesive properties were exactly what the skilled person would expect in view of the prior art. Also, D6, although being the closest prior art document, was by no means the only publication in the extensively studied filed of EPDM/rubber and it was well-known that EPDM had the properties of good ozone and weathering resistance. Therefore, the combination of properties of the claimed composition indicated by the Respondent could not impart an inventive step to the claimed subject-matter.

(e) In support of its arguments the Appellant referred to a number of documents not mentioned before in the proceedings and also filed a further Declaration by Prof. E. Andrews.

VI. Oral proceedings before the Board were held on 31 March 1999. The Appellant had been duly summoned to the hearing but informed the EPO by letter of 22 February 1999 that it would not attend the oral proceedings and awaited a decision on the merits of the case.

VII. The Respondent (Patentee)'s written and oral arguments can be summarized as follows:

(a) The opposition was not admissible since

- (i) Rule 36 EPC, to which the Opposition Division referred, was not applicable to opposition proceedings.
 - (ii) Due to the signature missing from the original document, the latter could not be regarded as a proper Notice of Opposition and, consequently, no valid opposition was filed. The valid filing was a prerequisite for remedying omitted acts. Since the admissibility of an opposition also required the authorization of a representative according to Article 133(2) EPC within the opposition term, the absence of the signature also meant that the Opponent was not properly represented.
 - (iii) In view of the importance of the admissibility issue as a point of law, the Respondent proposed to refer that question to the Enlarged Board of Appeal.
- b) None of the cited documents disclosed the compositions now being claimed. To extend the disclosure of D6 to the claimed range was contrary to the standing jurisprudence of the EPO. Therefore, the claimed subject-matter was novel.
- c) The problem solved by the patent in suit was to provide a composition with good adhesion, ozone resistance and cut growth. Since no linear relationship between adhesion and natural rubber content existed, contrary to the Appellant's allegations, and the combination of properties of

the claimed compositions was not apparent from the prior art compositions, the claimed subject-matter was inventive.

VIII. The Appellant requested that the decision under appeal be set aside and the patent be revoked.

The Respondent requested that the opposition be declared inadmissible and the above-mentioned question of law be referred to the Enlarged Board of Appeal, or, alternatively, that the appeal be dismissed and that the patent be maintained as amended.

Reasons for the decision

Admissibility of the appeal

1. The appeal is admissible.

Admissibility of the opposition

2. The issue of admissibility of the opposition had been raised by the Respondent during the proceedings before the first instance, which considered the opposition admissible. Since the Respondent had requested the maintenance of the patent in suit in an amended form and that request was granted, it was not adversely affected by the decision under appeal; consequently, it could not and in fact did not file an appeal against it (Article 107 EPC), but raised the objection again in response to the appeal lodged by the Appellant.

The admissibility of the opposition being an indispensable procedural requirement for considering the opposition, the issue can be dealt with at any stage of the proceedings (see also decision T 289/91, OJ EPO 1994, 649), independent of whether the party invoking the point was entitled to file an appeal or not. Accordingly, the admissibility of the opposition was duly assessed by the Board.

3. The Notice of Opposition was filed without having been signed.
 - 3.1 Pursuant to Rule 61a EPC, Part III, Chapter II, of the Implementing Regulations shall apply mutatis mutandis to documents filed in opposition proceedings. Part III, Chapter II, of the Implementing Regulations includes Rules 26 to 36 EPC, so that the Board concurs with the Respondent that a Notice of Opposition should be duly signed (Rule 36(3) first sentence, in conjunction with Rule 61a EPC). For the same reason, the Board finds that the reference to and application of Rule 36(3) EPC by the Opposition Division was correct, even if no explicit reference to Rule 61a EPC was made.
 - 3.2 The Board can see no reason why Rule 36(3) first sentence, requiring a signature, would apply, but the second sentence, offering a remedy for an omitted signature, would not, as the Respondent's argumentation would suggest.

Article 99(1) EPC requires the filing of a written reasoned statement. According to the Respondent, in the light of the "jurisdiction" this should be interpreted as containing a signature. However, the Respondent did

not specify what was meant by "jurisdiction" as no decisions taken by a board of appeal regarding that point were cited. In fact, Article 99(1) EPC and Rule 55 EPC, of which the latter contains a precise specification of the requirements for a valid Notice of Opposition, are silent about the presence of a signature. Rule 56(1) EPC, which deals with the rejection of the Notice of opposition as inadmissible, refers to those requirements, whereas Rule 56(2) refers to provisions other than those mentioned in Rule 56(1) EPC, and hence, in the light of Rule 61a EPC, to Rule 36 EPC. According to Rule 56(2) EPC, the Opposition Division shall invite the opponent to remedy the deficiencies noted by it within a period as it may specify.

In the present case, the omission of the lacking signature was remedied within the time limit set by the European Patent Office. Therefore, the Notice of Opposition retains its original date of receipt (Rule 36(3) EPC, third sentence).

- 3.3 Since the Notice of Opposition retains the original date of receipt, the Respondent's arguments regarding a lack of proper representation under Article 133(2) EPC do not hold water.
4. In the light of the above, the Board finds that the opposition is admissible.
5. For the same reasons, a question of law in that sense cannot be referred to the Enlarged Board.

Late filed documents

6. Originally, the Appellant based its opposition on four documents filed within the opposition period of nine months pursuant to Article 99(1) EPC. Later, six more documents were cited within the frame of a Statement by Professor Andrews. Since the Opposition Division made no statement as to the contrary and D6 was specifically considered, those additional documents were apparently admitted into the proceedings. With its Statement of Grounds of Appeal the Appellant filed a further Declaration by Professor Andrews and also referred to yet another document. In its reply to the Statement of Grounds of Appeal, the Respondent also made reference to three further documents.

The Board duly studied the late filed documents and came to the conclusion that part of them have been published after the priority date of the patent in suit and for that reason cannot be considered as prior art. The other late filed documents, which do belong to the prior art, would not influence the outcome of the decision and hence are not more relevant than the documents already in the proceedings. Moreover, with the exception of D6, no specific arguments would appear to be based on any of those late filed documents, since they were only mentioned in general terms. However, in the Opposition Division's decision, D6 was considered to represent the closest state of the art and the Appellant based most of its argumentation in appeal upon it; thus, the Respondent had and in fact used the opportunity to react to the arguments based on it.

Therefore, of the late filed documents, only D6 is admitted to the proceedings (Article 114(2) EPC).

Sufficiency of disclosure

7. The objection of insufficient disclosure was raised for the first time during the proceedings before the first instance, albeit outside the nine months time limit, and it was dealt with in the decision under appeal. That objection referred to the presence of a cross-linking agent and was not further pursued by the Appellant. The present objection, which refers to the mixing procedure, was made in reaction to a document cited by the Respondent for the first time in its reply to the Statement of Grounds of Appeal. According to the Appellant, that document showed that simple mixing, as described in the patent in suit, was not sufficient to obtain the desired results. Instead a number of repeated mixing cycles was necessary.

7.1 Since the present objection under Article 83 EPC has no relation with the objection raised initially, it is considered to be late filed, even if it was raised in response to a document filed late by the Respondent. As the claimed subject-matter concerns a composition of components in a specific ratio and there can be no doubt that the skilled person, also in the light of the disclosure in the patent specification (page 3, lines 29 to 30: "The composition according to the invention can be prepared by the well known methods for mixing of rubbery polymers including mixing on a rubber mill or in internal mixers such as a Banbury mixer."), would know how to prepare such mixture, the objection is not founded and cannot, therefore, be accepted. Moreover, even if intensive mixing of the composition components would improve the result, that is not to say that the mixing procedure is an essential feature and

the Appellant has not supported its assertion by any evidence.

- 7.2 Furthermore, the Appellant, which as the Opponent has the onus of proof (cf. T 219/83, OJ EPO, 211, corr. 328), has not provided any evidence that the examples in the patent specification could not be reproduced. As set out in Decision T 219/83, it is not sufficient in opposition proceedings for an opponent to impugn a granted patent with an unsubstantiated assertion (Reasons for the decision, point 12, fourth paragraph).

For these reasons, the Board concludes that the requirements of Article 83 EPC are met.

Novelty

8. The novelty objection was solely based upon D6, which describes the use of EPDM polymers and blends thereof with other types of EPDM as well as with highly unsaturated elastomers (Page 1, Abstract). In particular, EPDM/styrene butadiene (SBR) polymer blends are described to offer economic advantages of ozone resistance, heat aging as well as weather resistance and improved adhesion characteristics (paragraph bridging pages 6 and 7). Four different EPDM grades were evaluated based on a 50:50 EPDM:SBR ratio and compared to a 100% SBR control compound. In a description of the prior art (part 7, complete paragraph), it is said that in the past only limited success had been obtained with such blends because of the significantly different cure characteristics of SBR and EPDM, "especially as the 50:50 blend ratio was

approached". Improvement was obtained by increasing the unsaturation level, narrowing the molecular weight distribution and increasing the molecular weight of the EPDM component. Apart from the 50:50 ratio, no mention is made of specific ratios of the mixture components; in the board's view, that sole disclosure cannot be interpreted as extending to the specific amount of 30 to 45 parts by weight per 100 parts by weight of total elastomers as now required for the EPDM. Therefore, D6 does not disclose the subject-matter of Claim 1 as amended during the proceedings before the first instance.

Since the Appellant did not base its novelty objection on any other document than D6 and the Opposition Division considered the claimed subject-matter novel, it is clear that the other documents on file were not deemed to be detrimental to novelty either. The Board concurs with that view.

Closest document.

9. The patent in suit concerns EPDM elastomeric compositions.
 - 9.1 Such compositions have been disclosed in D6, which the Appellant, like the Opposition Division, regards as the closest state of the art. The Respondent however maintained that D6 did not address the same problem as the patent in suit.
 - 9.2 From D6 it can be seen that EPDM/SBR polymer blends offer the desirable combination of (i) ozone resistance, without the use of expensive antiozonants

which can stain and bloom, (ii) excellent heat aging and weather resistance as well as (iii) improved adhesion characteristics, which properties are important in many automotive mechanical goods applications (paragraph bridging pages 6 and 7).

The general teaching of D6 (paragraph bridging pages 7 and 8) focuses on the optimal EPDM properties that are needed for effective blending with highly unsaturated polymers like SBR. In the past, only limited success could be achieved with such polymer blends because the significantly different cure characteristics of SBR and EPDM resulted in physical polymer characteristics which were worse than the independent polymer properties, especially as the 50:50 ratio was approached. By choosing an EPDM with certain specific properties - i.e. a combination of increased unsaturation level, narrower molecular weight distribution and increased molecular weight - these results could, however, greatly be improved. All examples demonstrate the improved properties of 50:50 EPDM/SBR blends (Tables IV and V in conjunction with Figures 4 to 6). D6 concludes that "Overall, we have shown that high molecular weight, high unsaturation, narrow molecular weight distribution EPDM polymers make it possible to compound EPDM/SBR blends to improve the ozone resistance of SBR, without sacrificing properties due to benefits achieved in the actual blend morphology."

Therefore, D6 concerns the improvement of the physical properties of EPDM/SBR blends in general and, in particular, the improvement of the ozone resistance of SBR with a view to automotive applications.

9.3 According to the patent in suit, the claimed compositions should be useful in pneumatic tire side walls and to that end should have a good resilience, ozone resistance and fatigue life after vulcanization, which properties are inherently possessed by EPDM, as well as a good cured adhesion to adjacent rubber compounds, which property is lacking in EPDM (page 2, lines 3 to 22 of the patent in suit). Therefore, the patent in suit concerns the overall balance of properties of the rubber compositions and in particular the improved cured adhesion of such blends.

9.4 From the above it can be seen that, although D6 does not directly emphasize the adhesion properties of the rubber compositions, it does refer to the same technical field (automotive applications) as well as to the balance of properties of EPDM/rubber compositions. Hence, D6 can be regarded as an appropriate starting point for assessing the inventive step issue.

Inventive step

10. Although the compositions of D6 are said to have good ozone resistance, heat aging, weather resistance and adhesion characteristics, the balance of these properties was still capable of improvement.

10.1 Therefore, in accordance with the patent specification (page 2, lines 7 to 25 and 46 to 47), the technical problem underlying the patent in suit is to be seen in providing elastomeric EPDM/rubber compositions having an advantageous combination of resilience, ozone resistance and fatigue life after vulcanization as well as good cured adhesion to adjacent rubber compounds.

10.2 According to the patent in suit this problem is to be solved by a rubber composition characterized by 30 to 45 parts by weight per 100 parts by weight of total elastomers of a high molecular weight oil extended EPDM polymer having a bound non-conjugated diene content of from 6 to 15 weight percent of the EPDM, a Mooney viscosity of greater than 150 and an ethylene: propylene weight ratio of from 50:50 to 75:25, as defined in Claim 1.

10.3 The examples and comparisons with the prior art in the patent (Tables 1 to 6) show that the various aspects of the above-defined problem are effectively solved. In particular, it has been shown that the claimed elastomeric compositions have a favourable combination of resilience, ozone and weather resistance, aged fatigue life and adhesion properties.

11. The issue to be decided, therefore, is whether the claimed subject-matter is obvious having regard to the documents on file.

11.1 The general teaching of D6 is that the properties of EPDM/SBR mixtures are improved when the EPDM has a high unsaturation level and molecular weight as well as a narrow molecular weight distribution. As pointed out above (point 8), D6 is however completely silent regarding the effects of other ratios than the 50:50 exemplified in that document, so that a skilled person would have no information whatsoever about the features to be modified in order to solve the above-defined technical problem. Therefore, the claimed subject-matter could not be derived from D6.

The Appellant referred to two further documents regarding inventive step. One was not published before the priority date of the patent in suit, hence does not belong to the prior art; the other one, being late filed and not more relevant than the documents on file, has, accordingly, not been admitted to the proceedings. Consequently, those documents are not taken into account. No other documents were relied upon for the arguments against inventive step and none of the documents on file could, in the Board's opinion, render the claimed subject-matter obvious alone or in combination with D6.

- 11.2 The experimental results of the examples given in the patent in suit as well as later experiments have been discussed at length in order to prove or disprove the presence of an unexpected effect that could or could not be attributed to the use of the specific ratio of 30 to 45 parts by weight per 100 parts by weight of total elastomers of the high molecular weight EPDM polymer. For the presence of an inventive step, the EPC however does not require an unexpected effect, nor does the jurisprudence as developed by the boards of appeal. Though in certain circumstances the presence of a surprising effect may be indicative of an inventive step (see e.g. Decision T 154/87, of 29 June 1989, not published in OJ EPO, Reasons for the Decision, point 4.7) or the lack of it of its absence (See Decision T 164/94 of 11 November 1996, not published in OJ EPO, Reasons for the Decision, point 4.7), the question is rather to establish whether the claimed subject-matter was obvious to a skilled person having regard to the state of the art. In the present case the

point of discussion was, whether there was a steady change of adhesion over the claimed range so that an improvement of adhesive properties was to be expected. However, in the Board's opinion, this is not important for, even if a steady change in adhesion over the claimed range were present, that effect could not be derived from the prior art and, as a consequence, the skilled person had no incentive to consider that range. In view of this, the question as to whether any evidence of a surprising effect has been provided is not relevant.

Therefore, the Board comes to the conclusion that the combination of features required in Claim 1 in order to provide an improved balance of resilience, ozone resistance and fatigue life after vulcanization as well as good cured adhesion to adjacent rubber compounds in the EPDM/rubber mixture in accordance with the object underlying the present invention, was not obvious in the light of the available prior art, and, therefore, involves an inventive step.

12. As Claim 1 is allowable, the same applies to Claims 2 to 6, which are directed to preferred embodiments of Claim 1, as well as to Claims 7 to 9 which relate to articles made of compositions according to specific embodiments, all claims deriving their patentability from that of Claim 1.

Order

For these reasons it is decided that:

1. The opposition is admissible.
2. The request to have a question of law referred to the Enlarged Board of Appeal is rejected.
3. The appeal is dismissed.

The Registrar:

The Chairman:

E. Görgmaier

C. Gérardin