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D E C I S I O N
of 27 October 2005

Case Number: T 0262/04 - 3.3.03

Application Number: 97923342.6

Publication Number: 0904320

IPC: C08L 07/02

Language of the proceedings: EN

Title of invention:

Elastomer copolyether ester composition for flexible grease seals

Patentee:

DSM IP Assets B.V.

Former opponent:

E.I. Du Pont de Nemours & Company, Inc.

Headword:

-

Relevant legal provisions:

EPC Art. 123(2), 84, 56

Keyword:

"Amendments (main request) - added subject-matter (yes)"

"Amendments (auxiliary request I) - clarity (no)"

"Inventive step (auxiliary request II) - (yes) after amendment"

Decisions cited:

T 0331/87

Catchword:

-



Case Number: T 0262/04 - 3.3.03

D E C I S I O N
of the Technical Board of Appeal 3.3.03
of 27 October 2005

Appellant: DSM IP Assets B.V.
(Proprietor of the patent) Het Overloon 1
NL-6411 TE Heerlen (NL)

Representative: -

Respondent: E.I. Du Pont de Nemours and Company, Inc.
(Former opponent) 1007 Market Street
Wilmington, Delaware 19898 (US)

Representative: Morf, Jan Stefan
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Decision under appeal: Decision of the Opposition Division of the
European Patent Office dated 8 December 2003
and posted 22 December 2003 revoking European
patent No. 0904320 pursuant to Article 102(1)
EPC.

Composition of the Board:

Chairman: R. Young
Members: W. Sieber
E. Dufrasne

Summary of Facts and Submissions

I. The mention of the grant of European patent No. 0 904 320, in respect of European patent application no. 97 923 342.6, based on International application PCT/NL97/00304, filed on 30 May 1997 and claiming a BE priority of 5 June 1996 (BE 9600499), was published on 16 August 2001 (Bulletin 2001/33). The granted patent contained 12 claims, whereby the independent claims which are relevant for this decision, ie Claims 1 and 12, read as follows:

"1. Copolyether ester composition comprising a mixture of at least 2 copolyether esters A and B, composed of hard segments derived from at least one alkylene diol and at least one aromatic dicarboxylic acid and soft segments derived from at least one polyalkylene oxide glycol and at least one aromatic dicarboxylic acid, in which the concentration of soft segments X in A and the concentration of soft segments Y in B lie between 30 and 65 wt.%, relative to the copolyether ester and the molecular weights of X and Y lie between 500 and 3000 and $|M_x - M_y| \geq 400$.

12. Automotive bellows comprising the composition according to any one of Claims 1 to 7."

The remaining claims are not of importance for this decision and consequently they will not be considered in further detail.

II. A notice of opposition was filed on 16 May 2002 by DuPont de Nemours and Company requesting revocation of the patent in its entirety on the grounds of

Article 100(a) EPC (lack of novelty and lack of inventive step) and Article 100(b) EPC (lack of sufficiency of disclosure). The opponent had *inter alia* cited the following documents:

D1: US-A-5 059 638;

D2: US-A-5 260 387; and

D9: Declaration regarding CVJ boot by J.M. McKenna.

III. By a decision which was announced orally on 8 December 2003 and issued in writing on 22 December 2003, the opposition division revoked the patent. The decision was based on three sets of claims, namely a main request, a first and a second auxiliary request.

(a) Claim 1 of the main request corresponded to Claim 1 as granted, except that it contained the following further restrictions (amendments shown in bold):

"Copolyether ester composition **consisting of** a mixture of at least 2 copolyether esters A and B, ... and the molecular weights of X and Y lie between 500 and 3000 and $|M_x - M_y| \geq 400$, **in which composition the weight ratio of A and B lies between 0.25 and 4, and which composition optionally contains fillers, oxidation stabilizers, additives with a flame retardant effect and/or mould release agents.**"

Claim 10 read as follows:

"Automotive bellows comprising a copolyether ester composition comprising a mixture of at least 2 copolyether esters A and B, composed of hard segments derived from at least one alkylene diol and at least one aromatic dicarboxylic acid and soft segments derived from at least one polyalkylene oxide glycol and at least one aromatic dicarboxylic acid, in which the concentration of soft segments X in A and the concentration of soft segments Y in B lie between 30 and 65 wt.%, relative to the copolyether ester and the molecular weights of X and Y lie between 500 and 3000 and $|M_x - M_y| \geq 400$."

The remaining claims are not of importance for this decision and consequently they will not be considered in further detail.

- (b) The first auxiliary request corresponded to the main request, except for the following further amendments in Claim 1 (amendments shown in bold):

"... and which composition **contains 0.05 - 2 wt%** oxidation stabiliser and optionally contains fillers, and additives with a flame retardant effect and/or mould release agents."

- (c) Claim 1 of the second auxiliary request corresponded to Claim 1 of the main request, except for the following amendments (amendments shown in bold):

"... and the molecular weights of X and Y lie between 500 and 3000 and $|M_x - M_y| \geq 400$, **less than 35 wt% fillers and 0.05 - 2 wt.% oxidation stabilizers, and in which composition the weight ratio of A and B lies between 0.25 and 4.**"

The remaining claims are not of importance for this decision and consequently they will not be considered in further detail.

- (d) The opposition division held that all the requests met the requirements of Articles 123(2), 84 and 83 EPC.
- (e) However, the subject-matter of Claim 1 of the main request was not novel over D2. Furthermore, the requirements of Article 56 EPC were not met for all requests.

With respect to inventive step, D9 was considered to represent the closest prior art, which disclosed automotive bellows made from a copolyether ester similar to the HYTREL[®] type copolyether ester used in D2, Example 1. The claimed subject-matter differed from the closest prior art in the use of a particular copolyether ester mixture. However, a technical effect due to this distinguishing feature could not be acknowledged. The examples according to the invention differed from those according to the state of the art in more than the distinguishing feature (ie they contained more stabilizers) and did not therefore represent a fair comparison therewith. Thus, the alleged superior long time

performance of automotive bellows made from the claimed copolyether ester composition under elevated temperatures in contact with different automobile greases could not be taken into account for the assessment of inventive step, and the objective technical problem had to be seen in the mere provision of alternative automotive bellows. An expert looking for a solution to this problem would try mixtures of known polyether esters, in particular as it was known that such mixtures had been used in similar applications such as cable jackets (D2) or exterior automotive parts (D1).

IV. On 19 February 2004, the proprietor (appellant) filed a notice of appeal against the above decision with simultaneous payment of the prescribed fee.

With the statement of grounds of appeal, filed on 22 April 2004, the proprietor (appellant) submitted a main request and a 1st auxiliary request which were, apart from a correction of a clerical error in the 1st auxiliary request, retyped versions of the main request and the 1st auxiliary request before the opposition division.

Furthermore, three new documents were submitted:

D15: *G. Holden*, "Thermoplastic Elastomers", Kirk-Othmer Encyclopedia of Chemical Technology; John Wiley & Sons, online posting date May 17, 2002;

D16: Kirk-Othmer Encyclopedia of Chemical Technology, vol. 9, 1994, 20-21; and

D17: DSM Research Notitie 2000-01957NC by H.A.J.
Linssen: Overzicht NMR resultaten van concurrent
materiaal voor Arnitel.

V. In the statement of grounds of appeal and its further
submission dated 14 June 2005, the appellant argued in
essence as follows:

(a) D2 did not disclose a weight ratio of A and B
between 0.25 and 4 as required in Claim 1 of the
main request, or the features of the concentration
and the molecular weights of the soft segments X
and Y in copolyether esters A and B, let alone the
combination of these features.

(b) The examples in the patent in suit constituted a
fair comparison with the prior art and
demonstrated an improvement, ie increased
resistance to hot oil. To further illustrate the
improvement of the compositions according to the
invention, three additional experiments were
submitted, two according to the invention
(Examples III and IV) and one comparative
experiment (Comparative Example F).

VI. With the letter dated 18 May 2005, the opponent
withdrew its opposition and was, therefore, not a party
to the proceedings any more as regards the substance of
the case.

VII. In a communication, issued on 28 June 2005 accompanying
a summons to oral proceedings, the board indicated that,
contrary to the opinion expressed in the decision under
appeal, some of the amendments in Claim 1 of the main

request and the 1st auxiliary request, respectively, did not meet the requirements of Article 123(2) or Article 84 EPC.

VIII. With the letter dated 26 September 2005, the proprietor (appellant) refiled the main request and submitted new auxiliary requests I and II.

Furthermore, two new documents were submitted:

D18: Encyclopedia of Polymer Science and Engineering, vol. 12, John Wiley & Sons, 1988, 217-218, 242-244 and 75-77; and

D19: Handbook of Fillers and Reinforcements for Plastics, ed. H.S. Katz et al., Van Nostrand Reinhold Company, 1978, 3-5.

IX. With the letter dated 25 October 2005, the proprietor (appellant) filed a revised main request and 8 new auxiliary requests. Nearly all the auxiliary requests were considered to constitute alternative solutions to the objections raised by the board, and depending on which of these objections could be rebutted satisfactorily with the main request and which not, a choice would be made with which of the auxiliary requests the proceedings would be continued.

X. On 27 October 2005, oral proceedings were held before the board which were attended by the proprietor (appellant).

(a) Having been asked to justify the late filing of the new requests of 25 October 2005, the

proprietor (appellant) stated that the case had been reviewed recently and that the requests were designed to overcome the board's objections in various ways.

- (b) Since these new requests and the submissions relating to them were not admitted into the proceedings for consideration, the proprietor (appellant) relied upon its main request and auxiliary requests I and II, all filed on 26 September 2005.
- (c) With respect to the substantive issues relating to these requests, ie Articles 123(2), 84, 54 and 56 EPC, the proprietor (appellant) basically relied upon its written submissions of 14 June 2005 and 26 September 2005.

XI. The proprietor (appellant) requested that the decision under appeal be set aside and that the patent be maintained on the basis of the following requests, all filed with the letter dated 26 September 2005:

- main request (Claims 1 to 11), or, in the alternative,
- auxiliary request I (Claims 1 to 11), or, in the alternative,
- auxiliary request II (Claims 1 to 6).

- (a) The claims of the main request were identical with the claims of the main request which had been before the opposition division (point III(a), above).
- (b) The claims of auxiliary request I corresponded to the claims of the main request, except that Claim 1 read as follows (amendments shown in bold):

"Copolyether ester composition consisting of a mixture of **copolyether esters comprising** at least 2 copolyether esters A and B ..., and which composition optionally contains **carbon black, talcum, clay, colorants, 0.05-2 wt.%** oxidation stabilizer, additives with a flame retardant effect and/or mould release agents."

- (c) Claim 1 of auxiliary request II corresponded to Claim 10 of the main request and Claim 10 of the main request before the opposition division, respectively (points XI(a) and III(a), above)

Claims 2 to 6 were directed to elaborations of the automotive bellows according to Claim 1.

Reasons for the Decision

1. The appeal complies with Articles 106 and 108 EPC and Rule 64 EPC and is therefore admissible.

2. *Admissibility of late-filed requests*

2.1 Two days before the scheduled oral proceedings, the proprietor (appellant) filed a revised main request and 8 new auxiliary requests. However, these new requests were neither filed within the time limit set by the board in the communication accompanying the summons to oral proceedings nor can they be considered to be a response to this communication, since the proprietor (appellant) had already reacted in a reasonable way with the letter dated 26 September 2005. Thus, the new requests could have been filed much earlier, namely with the letter dated 26 September 2005. The fact that the file had been reviewed only recently, as argued by the appellant (proprietor), is not a valid reason that could justify the late filing.

Furthermore, the new requests do not offer a more promising approach to meet the board's objections than the requests filed on 26 September 2005. They merely multiply the alleged solutions to the objections whereby the proprietor (appellant) left it deliberately open in its accompanying letter which of the auxiliary requests should be pursued at the oral proceedings (point IX, above). This undirected filing of numerous requests at a very late state would expand the procedure contrary to the need of procedural economy (see Rules of Procedure of the Boards of Appeal, Article 10b(1)).

2.2 Consequently, in exercising its discretion, the board decided that the new requests filed on 25 October 2005 and the submissions relating to them were not to be admitted for consideration.

3. *Main request*

3.1 Amendments

3.1.1 One of the amendments in Claim 1 (point III(a), above) specifies that the copolyether ester composition optionally contains fillers and oxidation stabilizers.

3.1.2 As regards the optional presence of fillers, it is stated on page 5, lines 13-16 of the application as originally filed that "[T]he composition according to the invention may also contain the usual fillers, ...". Although the term "usual" is vague and not further defined in the application as originally filed (nor is the board aware of such a definition generally accepted in the relevant literature), it is not devoid of any meaning. Whilst according to the application as originally filed only usual fillers can be used in the compositions according to the invention, Claim 1 contains no restriction as regards the filler. In other words, all fillers can be used in the compositions according to Claim 1, whether they are usual or not. Hence, the omission of the word "usual" leads to information in amended Claim 1 that is different from the information in the application as originally filed and therefore violates Article 123(2) EPC.

3.1.3 As regards the incorporation of the oxidation stabilisers, it is noted that page 5, lines 8-11 of the application as originally filed indicates that "[T]he composition according to the invention preferably also contains 0.05-2 wt.%, preferably 0.1-1.5 wt.% of an oxidation stabilizer, ...". Thus, the application as

originally filed discloses that, if a stabilizer is present in the composition, the amount of stabilizer is 0.05-2 wt.%. There is no teaching in the application as originally filed which discloses the presence of the optional stabilizer in a more general way, whether as an oxidation stabilizer in an amount **below** 0.05 wt.% or **above** 2 wt.% or without **any** associated requirement as to its amount. By omitting the amount of stabilizer in Claim 1, the amendment has created a level of generality that is not present in the application as originally filed. Consequently, also this amendment does not meet the requirements of Article 123(2) EPC.

3.1.4 The proprietor (appellant) argued that omitting the word "usual" in the context of fillers and omitting the amount of the oxidation stabilizers did not violate Article 123(2) EPC since the skilled person would directly and unambiguously recognize that

- (i) the features "usual" and "0.05-2 wt.%" were not explained as essential in the disclosure;
- (ii) these features were not, as such, indispensable for the function of the invention in the light of the technical problem the invention served to solve;
- (iii) the removal required no modification of other features as compensation.

However, the criteria referred to by the proprietor (appellant) are given in the Guidelines for Examination in the European Patent Office (C-VI, 5.3.10) for a situation where a feature is removed or replaced from

an originally filed claim (see T 331/87; OJ EPO 1991, 22). In the present case, the situation is quite different and concerns the incorporation of a feature from the description into the claim. In such a situation, the only relevant question to be answered is whether or not the amendment proposed is clearly and unambiguously derivable from the application as originally filed.

Furthermore, it appears that the proprietor's (appellant's) attempt to justify the amendments ignores the context of the features as originally disclosed. The application as originally filed does not allow the partitioning of, for example, "0.05-2 wt.% oxidation stabilizer" into two separate features, ie "0.05-2 wt.%" and "oxidation stabilizer" since it discloses "0.05-2 wt.% oxidation stabilizer" as a unity.

3.1.5 In summary, Claim 1 of the main request is not allowable in view of Article 123(2).

3.2 Claim 1 of the main request being not allowable, the main request has to be refused.

4. *Auxiliary request I*

4.1 Amendments

4.1.1 Claim 1 of auxiliary request I indicates that the composition optionally contains 0.05-2 wt.% oxidation stabilizer. Although this amendment overcomes the objection raised under Article 123(2) EPC (point 3.1.3, above), the amendment is not allowable in view of Article 84 EPC.

4.1.2 Whilst it is indicated on page 5, lines 13-17 of the application as originally filed that the weight percentages for the usual filler are based on the composition including the filler, it is conspicuous to the board that the relevant passage for the oxidation stabilizer (page 5, lines 8-12) does not indicate the basis for the weight percentages for the oxidation stabilizer. Thus, it might be, as argued by the proprietor (appellant) during the oral proceedings, that the weight percentages for the oxidation stabilizer have to be calculated in analogy to the filler on the basis of all components of the composition. On the other hand, the fact that the application as originally filed refers to the weight percentages for oxidation stabilizer and usual filler in different ways could also mean that they do not have to be calculated in the same way. Thus, the weight percentages for the oxidation stabilizer could be calculated on the mixture of the at least two copolyether esters, ie on the essential components of the claimed composition. However, neither the application as originally filed nor the examples in the application as originally filed can clarify this ambiguity. Hence, the amendment in Claim 1 raises doubts as to the actual scope of the claim, in particular with respect to the actual content of the oxidation stabilizer.

4.1.3 Therefore, Claim 1 does not meet the requirements of Article 84 EPC.

4.2 Claim 1 of auxiliary request I being not allowable, the main request has to be refused.

5. *Auxiliary request II*

5.1 Amendments

5.1.1 Claim 1 is identical with Claim 10 of the main request (point III(a), above) which is based on Claim 12 as granted (point I, above). Neither the former opponent nor the opposition division raised an objection under Article 123(2) EPC; nor does the board see any reason to raise an objection of its own.

5.1.2 Claims 2 to 6 are dependent claims directed to elaborations of the automotive bellows according to Claim 1. These claims are based on the features disclosed in Claims 2 to 6 as granted (corresponding to Claims 2 to 6 as originally filed). Hence, the requirements of Article 123(2) EPC are met.

5.1.3 Nor does any objection with respect to Articles 123(3) or 84 EPC arise.

5.2 Sufficiency of disclosure

The decision under appeal held that the application as originally filed disclosed the invention, namely a copolyether ester composition as claimed in Claim 1 as granted, in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art. This applies equally to the now claimed automotive bellows comprising the copolyether ester composition of Claim 1 as granted. Thus, the board is satisfied that the claims of auxiliary request II meet the requirements of Article 83 EPC.

5.3 The claimed subject-matter, the technical problem

5.3.1 Claim 1 is concerned in general terms with automotive bellows comprising a polyether ester composition comprising a mixture of at least two copolyether esters A and B. Automotive bellows are admittedly known from D9 which is considered by the board, in line with the decision under appeal and the proprietor (appellant), to represent the closest state of the art.

D9 is a declaration of the former opponent that it was in possession of a constant velocity transmission joint bellows (CVT boot) which was on the market before the priority date of the patent in suit. The analytical data relating to this CVT boot showed that it was made from a single copolyether ester similar to the Hytrel[®]-type copolyether esters described in D2. In contrast to D9, Claim 1 requires that the automotive bellows comprises a specific mixture of copolyether esters.

5.3.2 According to page 2, lines 18-20 of the patent in suit, the aim of the invention is to provide a thermoplastic elastomer composition which, under more severe conditions with the new lubricants, prevents premature leakage of lubricant from the products obtained therewith.

The data in Table 2 of the patent in suit indicate that a composition comprising the copolyether esters A and B (composition A/B) according to the definition in Claim 1 shows better long term fatigue behaviour after contact with various types of greases than the unmixed copolyether ester B or the copolyether ester C (Hytrel[®]

8105 from DuPont de Nemours & Company) or composition D (copolyether ester A mixed with polybutylene terephthalate). Furthermore, compositions A/B and D and copolyether ester C were used to produce bellows by means of blow moulding, which bellows were subjected to an accelerated endurance test under practical conditions. In this practical test, in which the bellows had to endure at least $30 \cdot 10^6$ cross-sectional deformations, the bellows obtained from the composition according to Claim 1, ie composition A/B, were found to be superior to those according to the state of the art (Table 3 in the patent in suit).

The opposition division had not taken these effects described in Tables 2 and 3 of the patent in suit into account for assessing inventive step since they did not represent a fair comparison with the closest prior art (point III(e), above). However, the further experiments submitted by the proprietor (appellant) with the letter dated 14 June 2005 unambiguously demonstrate that the alleged technical effect, ie improved resistance of automotive bellows to hot oil, is indeed due to the use of the specific mixture of copolyether esters as defined in Claim 1 and not to a higher content of stabilizer as argued by the opposition division.

- 5.3.3 It follows from the above that the examples in the patent in suit in suit represent a fair comparison with the state of the art, in particular that they demonstrate a technical effect directly linked to the distinguishing feature, namely the use of a mixture of copolyether esters as defined in Claim 1. Hence, the board finds it credible that the objective technical problem is to improve the resistance of automotive

bellows to hot oil and that the claimed measures provide an effective solution to this problem.

5.4 Novelty

As apparent from the above analysis, D9 describes automotive bellows made from a single copolyether ester. D1 and D2 describe mixtures of copolyether esters but, without going into details concerning the mixture, both documents do not disclose automotive bellows made from these mixtures. D1 discloses applications such as exterior automotive parts, for example side cladding and rocker panels (column 1, lines 12-14), and D2 discloses the use of the claimed composition in cable jackets (column 1, lines 52-55). Thus, the claimed subject-matter is novel over the cited prior art.

5.5 Inventive step

5.5.1 To assess the question of inventive step, it is necessary to consider whether the skilled person, starting from D9 and wishing to improve the hot oil resistance of the automotive bellows disclosed therein, would have expected that this could be achieved by choosing a polyether ester composition as set out in Claim 1.

5.5.2 D9 is merely a declaration of the former opponent that it was in possession of a commercially available CVT boot made from a single copolyether ester. Hence, there is no suggestion in D9 itself how the resistance of such a CVT boot to hot oil could be further improved.

Since the other documents, and in particular D1 and D2, are not concerned with automotive bellows, or at least with the improvement of a copolyether ester composition to hot oil resistance, they cannot provide a hint to the solution to the posed problem.

- 5.5.3 In summary, the solution to the stated problem does not arise in an obvious way from the state of the art. Consequently, the subject-matter of Claim 1 of auxiliary request II, and by the same token, the subject-matter of dependent Claim 2 to 6 involves an inventive step.

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 on the basis of Claims 1 to 6 filed with the letter dated 26 September 2005 as auxiliary request II and after any necessary consequential amendment of the description.

The Registrar:

The Chairman:

E. Görgmaier

R. Young