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**Datasheet for the decision
of 21 July 2006**

Case Number: T 0807/03 - 3.3.03

Application Number: 96918426.6

Publication Number: 0843698

IPC: C08L 23/16

Language of the proceedings: EN

Title of invention:

Thermoplastic elastomers having improved cure

Patentee:

EXXONMOBIL CHEMICAL PATENTS, INC., ET AL

Opponents:

- 01: Koninklijke DSM N.V.
02: LANXESS Deutschland GmbH
03: Mitsui Chemicals, Inc.

Headword:

-

Relevant legal provisions:

EPC Art. 123(2)

Keyword:

"Amendments - added subject-matter (yes)"

Decisions cited:

G 0009/91, T 0840/93

Catchword:

-



Case Number: T 0807/03 - 3.3.03

D E C I S I O N
of the Technical Board of Appeal 3.3.03
of 21 July 2006

Appellant: ExxonMobil Chemical Patents, Inc.
(Patent Proprietor) 5200 Bayway Drive
Baytown, TX 77520-5200 (US)

Representative: Weber, Thomas
Patentanwälte
von Kreisler-Selting-Werner
Postfach 10 22 41
D-50462 Köln (DE)

Respondent 01: Koninklijke DSM N.V.
(Opponent 01) P.O. Box 9
NL-6160 MA Geleen (NL)

Representative: -

Respondent 02: LANXESS Deutschland GmbH
(Opponent 02) Kaiser-Wilhelm-Allee
D-51369 Leverkusen (DE)

Representative: -

Respondent 03:
(Opponent 03)

Mitsui Chemicals, Inc.
2-5 kasumigaseki 3-Chome
Chiyoda-ku
Tokyo 100 (JP)

Representative:

Cresswell, Thomas Anthony
J.A. KEMP & CO.
14 South Square
Gray's Inn
London WC1 R 5JJ (GB)

Decision under appeal:

**Decision of the Opposition Division of the
European Patent Office dated 10 April 2003 and
posted 21 May 2003 revoking European patent
No. 0843698 pursuant to Article 102(1) EPC.**

Composition of the Board:

Chairman: R. Young
Members: W. Sieber
H. Preglau

Summary of Facts and Submissions

I. The mention of the grant of European patent No. 0 843 698, in respect of European patent application no. 96 918 426.6, based on International application PCT/US96/09903, in the name of Exxon Chemical Patents Inc., now ExxonMobil Chemical Patents Inc., filed on 11 June 1996 and claiming a US priority of 14 June 1995 (US 490505), was published on 11 August 1999 (Bulletin 1999/32). The granted patent contained 13 claims, whereby Claims 4 and 7 read as follows:

4. A thermoplastic elastomer comprising:

a) an ethylene, alphaolefin, vinyl norbornene elastomeric polymer, said elastomeric polymer including:

- i) in the range of 70 to 90 mole percent ethylene;
- ii) in the range of from 0.2 to 1.5 mole percent vinyl norbornene;
- iii) and the balance comprising said alpha-olefin;

said mole percents based on the total moles of the elastomeric copolymer; wherein said elastomeric polymer has a branching index below 0.6, preferably below 0.4, more preferably below 0.3;

b) a thermoplastic selected from the group consisting of homopolymers and copolymers of propylene, polybutylene, homopolymers and copolymers of ethylene, polyethylene terephthalate, polybutylene terephthalate, polyamides, and mixtures thereof;

c) a curative comprising an organic peroxide;

d) a coagent; and

wherein said curative and said coagent are present in said thermoplastic elastomer at an amount effective to yield at least 95 percent cured elastomeric, preferably at least 96 percent cured elastomeric polymer.

7. In a method for preparing a thermoplastic elastomer comprising:

a) masticating

i) an elastomeric polymer containing ethylene in the range of from 40 to 90 mole percent, vinyl norbornene in the range of from 0.2 to 5 mole percent and the balance comprising an alpha olefin different from ethylene,

ii) a thermoplastic present in said thermoplastic elastomer in the range of from 10 to 900 parts per hundred parts of said elastomeric polymer; and

iii) a curative comprising an organic peroxide, said curative being present at a level to cure said elastomeric polymer to above 95 percent, said masticating carried out for a sufficient time to obtain a substantially homogeneous mixture;

b) adding a cure activator; and

c) masticating a product of (a) and (b) at a temperature and for a time sufficient to yield 95 percent or greater cure of said elastomeric polymer, said elastomeric polymer having a branching index below 0.6, preferably below 0.4, more preferably below 0.3

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

II. Notices of opposition were filed by:

- DSM N.V., now Koninklijke DSM N.V. (opponent 01), on 13 April 2000,
- Bayer AG, now Lanxess Deutschland GmbH (opponent 02), on 10 May 2000, and
- Mitsui Chemicals Inc. (opponent 03) on 11 May 2000.

The opponents requested revocation of the patent in its entirety based on the grounds of Article 100(a) EPC, ie lack of novelty and lack of inventive step, and on the grounds of Article 100(b) and (c) EPC.

III. By a decision which was announced orally on 10 April 2003 and issued in writing on 21 May 2003, the opposition division revoked the patent. The decision was based on two sets of claims, namely a main request and an auxiliary request headed "First Auxiliary Request.

(a) Claim 1 of the main request read as follows:

"A thermoplastic elastomer comprising:

a) an elastomeric polymer consisting of ethylene, alpha-olefin, vinyl norbornene, said elastomeric polymer including:

- i) in the range of 70 to 90 mole percent ethylene;
- ii) in the range of from 0.2 to 1.5 mole percent vinyl norbornene;
- iii) and the balance comprising said alpha-olefin;

said mole percents based on the total moles of the elastomeric copolymer; wherein said elastomeric polymer has a M_w/M_n above 6, a branching index below 0.6, and a Mooney viscosity in the range of from ML(1+4), 125°C of 20 to a MST(5+4)@200°C of 60;

b) a thermoplastic selected from the group consisting of homopolymers and copolymers of propylene, polybutylene, homopolymers and copolymers of ethylene, polyethylene terephthalate, polybutylene terephthalate, polyamides, and mixtures thereof;

c) a curative comprising an organic peroxide;

d) a coagent; and

wherein said curative and said coagent are present in said thermoplastic elastomer at an amount effective to yield at least 95 percent cured elastomeric polymer".

- (b) Claim 1 of the first auxiliary request read as follows:

"Use of a thermoplastic elastomer comprising:

a) an elastomeric polymer consisting of ethylene, alpha-olefin, vinyl norbornene, said elastomeric polymer including:

- i) in the range of 70 to 90 mole percent ethylene;
- ii) in the range of from 0.2 to 1.5 mole percent vinyl norbornene;
- iii) and the balance comprising said alpha-olefin;

said mole percents based on the total moles of the elastomeric copolymer; wherein said elastomeric polymer has a M_w/M_n above 6 and a branching index below 0.6;

b) a thermoplastic selected from the group consisting of homopolymers and copolymers of propylene, polybutylene, homopolymers and copolymers of ethylene, polyethylene terephthalate, polybutylene terephthalate, polyamides, and mixtures thereof;

c) a curative comprising an organic peroxide;

d) a coagent; and

wherein said curative and said coagent are present in said thermoplastic elastomer at an amount

effective to yield at least 95 percent cured elastomeric polymer by dynamic vulcanization".

- IV. The opposition division held that the term "**comprising** an organic peroxide" (emphasis added) in Claim 1 of the main request did not meet the requirements of Article 123(2) EPC/Article 100(c) EPC. The application as originally filed only provided support for a curative **selected from** organic peroxides (page 14, line 10).

As regards Claim 1 of the first auxiliary request the opposition division held that the wording of the claimed use was unclear (Article 84 EPC) because no purpose of the use was indicated. Furthermore, Claim 1 of the first auxiliary request extended the scope of protection, contrary to Article 123(3) EPC, because it claimed the use of the thermoplastic elastomer for any purpose while Claim 5 as granted was directed to the use of the thermoplastic elastomer as a lens gasket.

- V. Notice of appeal against the above decision was filed by the appellant (proprietor) on 25 July 2003, the required fee being paid on the same day.

In order to overcome the objections raised in the decision under appeal with respect to Article 123(2) and Article 84 EPC, the appellant filed on 23 September 2003 together with the statement of grounds of appeal two new sets of claims, namely a main request and an auxiliary request whereby Claim 1 of the main request was directed to a thermoplastic elastomer per se and Claim 1 of the auxiliary request was directed to a method for preparing a thermoplastic elastomer.

VI. In a letter dated 18 November 2003, respondent 02 (opponent 02) objected to the claims of the main request and the auxiliary request in view of Articles 84 and 83 EPC.

VII. In a letter dated 13 April 2004, respondent 03 (opponent 03) argued that the claims of the main request and the auxiliary request were not allowable in accordance with the provisions of Articles 83, 54(3) and 56 EPC. In this context, the following documents were filed:

D42: Experimental reports regarding JP-B-59-14497;

D43: Experimental reports regarding EP-A-0 094 051; and

D44: Experimental reports regarding JP-A-63-8408.

With the letter of 15 April 2004, respondent 03 filed executed versions of D42-D44.

VIII. In a communication dated 2 May 2006, the board set out the points to be discussed at the oral proceedings scheduled for 21 July 2006, namely issues relating to the amendments in the claims (Articles 84 and 123(2) EPC).

IX. In a letter dated 16 June 2006, respondent 03 further elaborated on the argument that the claims put forward by the appellant were invalid on the ground of insufficiency. The following further document was filed:

D45: Standard Test Method ASTM D1646-81.

- X. In a letter dated 20 June 2006, the appellant filed new sets of claims, namely a main request and first to third auxiliary request which replaced the previously filed requests.
- XI. On 20 July 2006, respondent 01 (opponent 01) informed the board via fax that it would not participate in the oral proceedings scheduled for 21 July 2006.
- XII. On 21 July 2006, oral proceedings were held before the board at which respondent 01 (opponent 01), as announced, was not represented. In accordance with Rule 71(2) EPC, the oral proceedings were continued in its absence.
- (a) At the beginning of the oral proceedings, the appellant withdrew the main request and the first auxiliary request filed on 20 June 2006. The second and the third auxiliary requests also filed on 20 June 2006 became the new main request (two claims) and the sole auxiliary request (two claims), respectively.

According to the appellant, Claim 1 of each request was allowable under Article 123(2) EPC since it was based on a combination of granted Claims 7 and 4.

(b) Claim 1 of the main request read as follows:

"A method for preparing a thermoplastic elastomer comprising:

A. masticating

a) an elastomeric polymer consisting of ethylene, alpha-olefin, and vinyl norbornene, said elastomeric polymer including:

- i) in the range of 70 to 90 mole percent ethylene;
- ii) in the range of from 0.2 to 1.5 mole percent vinyl norbornene; and
- iii) the balance being represented by said alpha-olefin;

said mole percents based on the total moles of the elastomeric copolymer; wherein said elastomeric polymer has a M_w/M_n above 6 and a branching index below 0.6;

b) a thermoplastic selected from the group consisting of homopolymers and copolymers of propylene, polybutylene, homopolymers and copolymers of ethylene, polyethylene terephthalate, polybutylene terephthalate, polyamides, and mixtures thereof in an amount of 10 to 900 parts per hundred parts of said elastomeric polymer;

c) a curative selected from organic peroxides, said curative being present at a level to

cure said elastomeric polymer to above
95 percent,

said masticating carried out for a sufficient time
to obtain a substantially homogeneous mixture;

B. adding

d) a cure activator; and

C. masticating a product of steps A and B at a
temperature and for a time sufficient to yield
95 percent or greater cure of said elastomeric
polymer".

(c) Claim 1 of the auxiliary request corresponded to
Claim 1 of the main request, except that the
amounts of ethylene, alpha-olefin and vinyl
norbornene in the elastomeric polymer a) were
defined as follows:

"i) in the range of 70 to 89.9 mole percent
ethylene;

ii) in the range of from 0.2 to 1.5 mole percent
vinyl norbornene; and

iii) in the range of from 10 to 29.8 mole percent
of alpha-olefin".

Claim 2 of the main and the auxiliary request is
not of importance for this decision and will
therefore not be discussed in further detail.

(d) Respondent 02 argued that the term "the balance
being represented by said alpha-olefin" in the
definition of the elastomeric polymer a) in

Claim 1 was added subject-matter (Article 123(2)/ Article 100(c) EPC). Furthermore, Claim 1 of the main request was not an allowable combination of Claims 7 and 4 as granted because the level of curative was defined in different terms in granted Claim 7 and granted Claim 4.

- (e) Respondent 03 questioned the admissibility of the main and the auxiliary request. These requests had not been considered by the opposition division and represented a change of case. In the end, they rendered the entire proceedings before the opposition division meaningless.

Apart from that, the claims of the new requests contravened Rule 57a EPC (unnecessary tidying up) and Article 84 EPC (unclear wording).

Finally, Claim 1 of each request did not meet the requirements of Article 123(2) EPC because the combination of features now claimed was not clearly and unambiguously derivable from the application as originally filed. In fact, by picking isolated features, such as the narrow ranges for ethylene and vinyl norbornene for the elastomeric polymer, the appellant had created a new combination which was not originally disclosed.

XIII. The appellant requested that the decision under appeal be set aside and the case be remitted to the first instance for further prosecution

- on the basis of the set of claims (Claims 1 and 2) filed on 20 June 2006 as second auxiliary request (now main request), or, in the alternative,
- on the basis of the set of claims (Claims 1 and 2) filed on 20 June 2006 as third auxiliary request (now the sole auxiliary request).

XIV. Respondent 02 and respondent 03 requested that the appeal be dismissed.

In the event that the appeal should not be dismissed, respondent 03 further requested that the case be remitted to the first instance for consideration of sufficiency, novelty and inventive step.

XV. Respondent 01 did not file any request.

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 main and auxiliary request*

2.1 The appellant has filed during the appeal proceedings a new main and (sole) auxiliary request whereby Claim 1 of each request is directed to a method for preparing a thermoplastic elastomer. According to respondent 03,

these new requests should not be admitted into the proceedings because they represented a change of case from the claims underlying the decision under appeal to claims which had not been considered by the opposition division. In the end, this would render the entire proceedings before the opposition division meaningless.

- 2.2 As stated in G 9/91 (OJ EPO 1993, 408; paragraph 18 of the reasons), "The purpose of the appeal procedure *inter partes* is mainly (emphasis by the board) to give the losing party the possibility of challenging the decision of the Opposition Division on its merits". In other words, it is not exclusively the function of an appeal to give a judicial decision upon the correctness of a decision taken by a first instance department, in this case the opposition division.

Thus, in general, the admission of a new request put forward by a proprietor on appeal being not identical to the ones already before the opposition division is a matter of discretion of the appeal board. In the past, the practice of the boards of appeal in this respect has been generous, even if new requests with claims of considerably altered scope had been submitted, because such new requests are very often the last chance for the proprietor to obtain any patent for the particular subject-matter (eg T 840/93, OJ EPO, 1996, 335, point 3.2 of the reasons). This is entirely true in the present case where the patent has been revoked by the opposition division.

- 2.3 Furthermore, the appellant had already filed at the earliest possible stage, ie with the statement of grounds of appeal, an auxiliary request (point V, above)

containing a method claim similar to those now under consideration. Hence, the new requests could neither occasion surprise to the other parties nor any unreasonable difficulty of understanding. Consequently, Article 10b(1) of the Rules of Procedure of the Boards of Appeal does also not constitute a bar to the admissibility of these new requests.

2.4 In view of the above, the main request and the auxiliary request were admitted into the proceedings.

3. *Amendments (main request)*

3.1 Claim 1 of the main request (point XII(b), above) is directed in general terms to a method for preparing a thermoplastic elastomer where an elastomeric polymer a) is masticated in various steps with a thermoplastic component b), a curative c) and a cure activator d). The elastomeric polymer a) consists of 70-90 mole percent ethylene, 0.2-1.5 mole percent vinyl norbornene and the balance being represented by an alpha-olefin.

3.2 It has been admitted by the appellant that Claim 1 of the main request neither has a counterpart in the granted claims (or the claims as originally filed) nor in the patent specification (or in the application as originally filed). Nevertheless, Claim 1 of the main request is, according to the appellant, an allowable combination of Claim 7 as granted (based on Claim 8 as originally filed) and Claims 4 as granted (based on Claim 5 as originally filed).

3.3 Since, however, the elastomeric polymer referred to in Claim 7 as granted (point I, above) is defined in

broader terms with respect to its composition (40-90 mole percent ethylene, 0.2-5 mole percent vinyl norbornene) than the elastomeric polymer referred to in Claim 4 as granted (70-90 mole percent ethylene, 0.2-1.5 mole percent vinyl norbornene), the decisive question concerning Article 123(2) EPC is whether or not there is a clear and unambiguous disclosure in the patent specification and the application as originally filed, respectively, for such a combination of granted Claims 7 and 4.

- 3.3.1 Firstly, it is noted that Claim 7 as granted is an independent claim which does not refer back to the thermoplastic elastomer of Claim 4 as granted. Hence, the claim structure does not identify granted Claim 4 (or elements thereof) as a preferred embodiment of the more general method as defined in Claim 7 as granted.
- 3.3.2 Secondly, Claim 7 as granted requires the addition of a **cure activator**. On the other hand, the thermoplastic elastomer of Claim 4 as granted comprises a **coagent**. Thus, it is conspicuous to the board that the broader ranges of 40-90 mole percent ethylene and 0.2-5 mole percent vinyl norbornene for the elastomeric polymer in Claim 7 as granted are given in the context of a cure activator whereas the narrower ranges of 70-90 mole percent ethylene and 0.2-1.5 mole percent vinyl norbornene in Claim 4 as granted are given in the context of a coagent. It is, however, not clear from the patent specification and the application as originally filed, respectively, whether the terms "cure activator" and "coagent" are to be understood as equivalent terms. The only relevant passage in this context (page 7, line 43 of the patent specification

and page 14, lines 22-23 of the application as originally filed, respectively) cannot shed light upon this uncertainty. This passage merely states:

"In addition to peroxide, other cure adjuvants or coagents can be used."

If one assumes that the terms "cure activator" and "coagent" are not equivalent in the present case, Claims 7 and 4 are incompatible with each other, and the combination of granted Claims 7 and 4 is not allowable anyway. On the other hand, if one assumes, in favour of the appellant, that these terms are equivalent, the combination of granted Claims 7 and 4 is still not allowable for the following reason: According to granted Claim 7, the curative is present at a level to cure the elastomeric polymer to above 95 percent whereas according to granted Claim 4, curative and coagent are present in an amount to yield at least 95 percent cured elastomer. In other words, the effective amount of curative is defined differently in granted Claim 7 and 4, respectively.

Thus, on the face of it, Claims 4 and 7 as granted appear to be incompatible with each other because the actual claim wording seems to necessitate some qualification or modification in order to combine the two claims. However, such a qualification or modification is not clearly and unambiguously derivable from the application as originally filed.

3.3.3 Finally, also the patent specification itself and the application as originally filed, respectively, do not provide explicit or implicit support for the subject-

matter of Claim 1 of the main request. The only passage referring to an elastomeric polymer with 70-90 mole percent ethylene and 0.2-1.5 mole percent vinyl norbornene can be found in paragraph [0028] of the patent specification (page 8, lines 20-23 of the application as originally filed):

"For the fabrication of translucent TPEs, where lack of haze is of importance, the preferred ranges of the elastomeric polymer are in the range of from 70 to 90 mole percent ethylene, and in the range of from 0.2 to 1.5 mole percent vinyl norbornene, preferably 0.4 to 1.5 and a range of Mooney viscosities from 20 (ML) to 60 (MST)."

Thus, this passage associates the narrower ranges of 70-90 mole percent ethylene and 0.2-1.5 mole percent vinyl norbornene for the elastomeric polymer with specific Mooney viscosities. Consequently, this passage is not a proper basis for the definition of an elastomeric polymer without Mooney viscosities as in Claim 1 of the main request.

- 3.4 In summary, the combination of features presented in Claim 1 of the main request is neither clearly and unambiguously derivable from the claims as granted (or the claims as originally filed) nor from the patent specification (or the application as originally filed). Although the features "70-90 mole percent ethylene and 0.2-1.5 mole percent vinyl norbornene" for the elastomeric polymer are disclosed in various passages of the patent in suit (ie Claim 4 as granted, paragraph [0028]), these features are not presented in the context of the more general method of Claim 7 as granted. There is no level of generality apparent from

the patent specification and the application as originally filed, respectively, which would justify the combination of these narrow ranges with the more general method of Claim 7 as granted. A patent specification and a patent application, respectively, must not be considered as something in the nature of a reservoir from which it would be permissible to draw features pertaining to separate embodiments in order to create a new embodiment, if, as in the present case, such a combination is not suggested by the patent specification and the patent application, respectively. Consequently, Claim 1 of the main request does not meet the requirements of Article 123(2) EPC.

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

3.6 As Claim 1 of the main request does not meet the requirements of Article 123(2) EPC, any further consideration concerning the requirements of, for example, Articles 84 or 123(3) or Rule 57a EPC is superfluous.

4. *Auxiliary request*

4.1 Claim 1 of the auxiliary request (point XII(c), above) corresponds to Claim 1 of the main request, except that the amount of the alpha-olefin in the elastomeric polymer a) is given in terms of a defined range (with a consequential amendment of the upper limit for ethylene). However, the objection raised under Article 123(2) EPC against Claim 1 of the main request (point 3, above) in its essence also applies to Claim 1 of the auxiliary request: There is no clear and

unambiguous disclosure in the patent specification and the application as originally filed, respectively, which would support the combination of the narrower ranges of ethylene and vinyl norbornene for the elastomeric polymer (as disclosed in granted Claim 4 or in paragraph [0028] of the patent specification) with the more general method of Claim 7 as granted. Consequently, Claim 1 of the auxiliary request does not meet the requirements of Article 123(2) EPC.

4.2 Claim 1 of the auxiliary request being not allowable, the (sole) auxiliary request has to be refused.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

E. Görgmaier

R. Young