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**Datasheet for the decision
of 12 October 2005**

Case Number: T 0827/02 - 3.2.07

Application Number: 93120774.0

Publication Number: 0599356

IPC: C09K 3/10

Language of the proceedings: EN

Title of invention:

Containers and compositions for sealing them

Patentee:

W.R. GRACE & Co.-CONN

Opponent:

DS-Chemie GmbH

Headword:

-

Relevant legal provisions:

EPC Art. 54, 56, 83, 123(2)

Keyword:

"Added subject-matter - no"

"Insufficiency of disclosure of the patent with amended claims
- not examined by Opposition Division"

"Insufficiency - no"

"Inventive step - no"

Decisions cited:

-

Catchword:

-



Case Number: T 0827/02 - 3.2.07

DECISION
of the Technical Board of Appeal 3.2.07
of 12 October 2005

Appellant I/Respondent II: W.R. GRACE & Co.-CONN
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Decision under appeal: Interlocutory decision of the Opposition
Division of the European Patent Office posted
18 June 2002 concerning maintenance of the
European patent No. 0599356 in amended form.

Composition of the Board:

Chairman: H. Meinders
Members: P. O'Reilly
C. Holtz
H.-P. Felgenhauer
E. Lachacinski

Summary of Facts and Submissions

- I. Opposition was filed against European Patent No. 0 599 356 as a whole based on Article 100(a) EPC (lack of novelty and lack of inventive step). The opposition was based on D1: GB-A-1 112 025 and an alleged prior use.
- II. The Opposition Division decided to maintain the patent in amended form based on the first auxiliary request filed at the end of the oral proceedings before it. It found the subject-matter of claim 1 of the main request filed on 21 February 2001 to lack novelty.
- III. Appellant I/respondent II (hereinafter appellant/proprietor) and appellant II/respondent I (hereinafter appellant/opponent) each filed an appeal against the decision of the Opposition Division.
- IV. The appellant/proprietor requested that the decision under appeal be set aside and that the patent be maintained in accordance with the main request filed on 21 February 2001 with claims 7 and 9 deleted and the remaining claims renumbered accordingly. The appellant/proprietor further requested that the appeal of the appellant/opponent be dismissed.

The appellant/opponent requested that the decision under appeal be set aside and that the patent be revoked. The appellant/opponent further requested that the appeal of the appellant/proprietor be dismissed.

- V. Oral proceedings were held before the Board on 12 October 2005.

VI. Claim 1 of the patent as granted (main request) reads as follows:

"1. A beer bottle cap lined with a gasket formed of a thermoplastic polymer composition characterised by comprising a homogeneous blend of 20 to 60% by weight butyl rubber, which is a copolymer of isoprene and butylene, and 40 to 80% by weight other thermoplastic polymer, which comprises high density polyethylene."

Claim 1 of the first auxiliary request (patent as maintained by the Opposition Division) reads as follows (amendments when compared to claim 1 of the main request are depicted in bold or struck through):

"1. A beer bottle cap lined with a gasket formed of a thermoplastic polymer composition characterised by ~~comprising~~ **consisting only of** a homogeneous blend of 20 to 60% by weight butyl rubber, which is a copolymer of isoprene and butylene, and 40 to 80% by weight ~~other thermoplastic polymer, which comprises~~ high density polyethylene."

VII. The arguments of the appellant/proprietor may be summarised as follows:

(i) With respect to the main request the amendments made to claim 1 compared to the patent as granted comply with Article 123(2) EPC. On page 5, lines 15 to 18 of the patent specification it is indicated that high density polyethylene may be preferred so that the skilled person knows that high density polyethylene may be used as the

thermoplastic and when doing so throughout the whole claimed range.

- (ii) The objection under Article 83 EPC is late filed and was not admitted by the Opposition Division. The ground should not be admitted into the appeal proceedings since it is a new ground in the appeal proceedings.

Moreover, the patent as amended complies with Article 83 EPC. There are several examples in the description of the patent which disclose compositions comprising butyl rubber and high density polyethylene (see for example table 1). These examples cover most of the claimed range. There is no experimental proof that the compositions specified in claim 1 are not homogeneous. The appellant/opponent has cited a passage in US-A-5 731 053 (see column 7, line 37 to column 8, line 3) as proof that the compositions are heterogeneous over part of the range. However, there is nothing in that passage which indicates that a homogeneous mixture cannot be obtained. The passage merely mentions the existence of heterogeneous compositions.

- (iii) The subject-matter of claim 1 of the main request is novel. The generic disclosure of polyethylene in D1 does not disclose the specific feature of claim 1.

The prior use considered by the Opposition Division in the decision under appeal is not proven "up to the hilt".

- (iv) The subject-matter of claim 1 of the main request involves an inventive step. The selection of high density polyethylene provides advantages. This is stated in the patent on page 6, lines 56 to 57 and page 8, lines 2 to 3 where the superiority of high density polyethylene over low density polyethylene is mentioned. In conjunction with their European application No. 91 104 029.3 the appellant/opponent filed, with letter of 3 December 1996, an affidavit of Mr. J. Skilton dated 12 October 1995. In that affidavit it is stated that high density polyethylene gives surprising results when used in place of low density polyethylene in the examples disclosed in D1. This is evidence of an inventive step in the subject-matter of claim 1.
- (v) The subject-matter of claim 1 of the auxiliary request complies with Article 123(2) EPC. Since the examples given in the description of the patent in suit which mention high density polyethylene in each case disclose a composition consisting only of butyl rubber and high density polyethylene the arguments brought forward with respect to claim 1 of the main request also apply to claim 1 of the auxiliary request.
- (vi) The patent as amended according to claim 1 of the auxiliary request complies with Article 83 EPC. Since the examples given in the description of the patent in suit which mention high density polyethylene in each case disclose a composition consisting only of butyl rubber and high density

polyethylene the arguments brought forward with respect to the patent as amended according to the main request also apply to the patent as amended according to the auxiliary request.

(vii) The subject-matter of claim 1 of the auxiliary request is novel and involves an inventive step for the same reasons as explained with respect to the main request.

VIII. The arguments of the appellant/opponent may be summarised as follows:

(i) The amendments made to claim 1 of the main request do not comply with Article 123(2) EPC. There is no general disclosure over the whole claimed range of a composition including butyl rubber and high density polyethylene. Even the specific examples in the description do not cover the entire claimed range.

(ii) The patent as amended according to the main request does not comply with Article 83 EPC. There is experimental evidence as set out in US-A-5 731 053 (see column 7, line 37 to column 8, line 3) which shows that butyl rubber and high density polyethylene do not form a homogeneous mixture over the whole range specified in claim 1. In particular, when the high density polyethylene content is 50% or more a heterogeneous mixture is formed. The patent in suit, however, does not disclose how a homogeneous mixture can be formed in this case.

(iii) Claim 1 of the main request lacks novelty over D1. Claim 1 constitutes a numerical selection, i.e. the density of the polyethylene, over the generic disclosure of D1. The selection however is not purposive, as required to establish novelty, since tables 1 to 4 of the patent in suit show that high density polyethylene does not produce better results, and from table 4 it is shown that the selection mainly produces unacceptable results.

Claim 1 of the main request lacks novelty over the prior use considered by the Opposition Division in the decision under appeal.

(iv) Claim 1 of the main request lacks inventive step over D1 which explicitly discloses all the features of claim 1 except for the use of high density polyethylene with butyl rubber. D1 indicates that any polyethylene may be used with butyl rubber. High density polyethylene is just an alternative to the low density polyethylene specifically disclosed in D1. There is no indication that high density polyethylene is better than low density polyethylene. The only result in table 2 of the patent in suit for which it is better than low density polyethylene is because of the type of butyl rubber that is used. In table 4 the only result that is better is when the butyl rubber content is above 30% otherwise the venting is not acceptable. There are no good results throughout the entire claimed range.

(v) The amendments made to claim 1 of the auxiliary request do not comply with Article 123(2) EPC for

the same reasons as explained with respect to the main request.

(vi) The patent as amended according to the auxiliary request does not comply with Article 83 EPC for the same reasons as explained with respect to the main request.

(vii) The subject-matter of claim 1 of the auxiliary request does not involve an inventive step for the same reasons as explained with respect to the main request.

Reasons for the Decision

Main request

1. *Article 123(2) EPC*

1.1 The matter at issue is whether the amendment to claim 1 as granted which adds the words "which comprises high density polyethylene" has resulted in a claim which does not comply with Article 123(2) EPC.

1.2 Since the relevant parts of the patent specification have their counterparts in the application as filed the patent specification is referred to below for convenience.

1.3 On page 5, lines 9 to 14 of the patent specification it is explained that the thermoplastic material can be chosen from a number of preferred possibilities. In lines 15 to 18 of page 5 it is explained that

polyethylene is particularly preferred. It is stated there that in some instances low density polyethylene (hereinafter LDPE) is preferred but in general high density polyethylene (hereinafter HDPE) is more suitable. In tables 1 and 2 of the patent specification some examples of compositions are given as well as an indication of their impermeability to oxygen. Two of these compositions contain 50% HDPE and 50% butyl rubber. In table 3 the results of testing for trichloro anisole (hereinafter TCA) on twelve compositions is given. One of these compositions contains 50% HDPE and 50% butyl rubber. In table 4 the results of testing venting pressures on eight compositions is given. Three of these compositions contain HDPE in the amounts of 80%, 70% and 50% respectively, combined with respectively 20%, 30% and 50% butyl rubber. In the case of table 4 the examples of compositions containing HDPE cover most of the range for HDPE specified in claim 1, i.e. 50 to 80% compared with the claimed range of 40 to 80%. Given the examples of table 4 and the general statement on page 5, lines 15 to 18 that HDPE is generally more suitable the Board is satisfied that the skilled person would understand that the range of 40 to 80%, specified in the patent as granted for thermoplastic polymers in general, also applies to the particular case of HDPE.

1.4 The Board therefore concludes that claim 1 of this request complies with Article 123(2) EPC.

2. *Article 83 EPC*

2.1 It is not clear if the Opposition Division considered that the objection pursuant to Article 83 EPC

constituted a late filed ground of opposition and hence disregarded it. The minutes of the oral proceedings before the Opposition Division are not conclusive on this point. The minutes concern four parallel opposition cases discussed sequentially. For the first patent (EP-B-488491) that was discussed in the oral proceedings the Opposition Division refused to admit this objection, considering it a late filed ground. It is not clear whether that refusal concerning a preceding case also applied to the patent in suit. The appellant/proprietor disputed the admissibility of this objection in his submission dated 9 May 2003.

2.2 Irrespective of the actions of the Opposition Division, in the opinion of the Board the objection cannot be considered a late filed ground of opposition. Since the patent had been amended it was indeed the duty of the Opposition Division to examine the patent, in so far as it has been amended, for compliance with Article 83 EPC in view of Article 102(3) EPC which states that a patent as amended must meet the requirements of the Convention. Under the established Case Law of the Boards of Appeal, amendments must be examined against the whole of the EPC, see Case Law of the Boards of Appeal of the EPO, 4th edition, 2001, VII.C.10.2. The amendments made must therefore be examined for compliance with Article 83 EPC.

2.3 As explained above with respect to Article 123(2) EPC, the description contains general statements together with the specific examples, e.g. as set out in table 4, which cover most of the breadth of claim 1. There is no reason to believe that the invention cannot be carried out throughout the whole breadth of claim 1.

2.3.1 The appellant/opponent argued that there was experimental evidence that a homogenous mixture of HDPE and butyl rubber could not be formed throughout the claimed range. The experimental evidence is disclosed in US-A-5 731 053 in column 7, line 37 to column 8, line 3. US-A-5 731 053 is a US continuation-in-part application, filed by the appellant/opponent and published after the publication date of the application underlying the patent in suit. The fact that the publication date is after both the priority and the publication dates of the patent in suit is not relevant since a potential opponent can self-evidently only carry out tests based on the teaching of a patent application after the application has been published. This means that tests carried out to check the sufficiency of disclosure of a patent or patent application are by necessity carried out after the respective publication. The Board therefore considers the quoted passage in US-A-5 731 053 may be considered as evidence with respect to Article 83 EPC.

2.3.2 In column 7, line 37 to column 8, line 3 of US-A-5 731 053 it is explained that a heterogeneous mixture of butyl rubber and thermoplastic polymer is unexpectedly advantageous compared to the previously known homogeneous mixtures. The passage explains that a pseudolaminate structure is formed. It is suggested that the basis for this heterogeneous structure appears to be a mixing incompatibility of butyl rubber and thermoplastic polymer. It is considered that the desired, i.e. heterogeneous, structure can be obtained by selecting suitable types of polymer and weight ratios. From this passage the Board understands that

homogenous mixtures were known and considered desirable but the inventor of US-A-5 731 053 had found that if the conditions are changed such as to produce a heterogeneous structure then an unexpected advantage occurs. There is thus nothing in this passage to suggest that it was not possible to obtain homogeneous compositions throughout the entire claimed range. The passage indeed gives the contrary information that homogeneous compositions are normal and a special effort is required to obtain a heterogeneous structure.

2.4 The patent according to this request therefore satisfies the requirements of Article 83 EPC.

3. *Novelty and inventive step*

3.1 The appellant/opponent has argued lack of novelty based either on D1 or on the prior use considered in the decision under appeal, as well as lack of inventive step based on D1. The prior use is contested by the appellant/proprietor. The Board therefore considers it expedient to first consider D1 since there is no dispute between the parties that this document belongs to the state of the art in the sense of Article 54(1) EPC.

3.2 The argument of the appellant/opponent regarding lack of novelty is not based on an explicit disclosure of the subject-matter of claim 1 in D1, but rather on the basis that the claimed selection of HDPE constitutes a selected sub-range such that the criteria for novelty of the selection are not fulfilled, (cf. Case Law of the Boards of Appeal of the EPO 4th edition 2001, I.C.4.2.1). Since the Board considers, as explained

below, that the selection of HDPE is obvious for the skilled person it is not necessary to consider whether or not the selection in this instance forms a sub-range and, if so, whether the sub-range fulfils the criteria for novelty.

3.3 The closest undisputed prior art is represented by D1 which discloses (in example 7) a bottle cap lined with a gasket formed of a thermoplastic polymer composition characterised by comprising a homogeneous blend of 50 parts by weight butyl rubber and 50 parts by weight of the thermoplastic polymer LDPE. The bottle cap is stated in this example to be suitable for use with a bottle containing carbonated water. In the opinion of the Board such a bottle cap would also be suitable as a beer bottle cap since a cap for carbonated bottled water must fulfil the same requirements as a cap for bottled beer as regards liquid and gas impermeability as well as venting pressure. Also, the specification of the patent in suit gives no indication of any special requirements which would apply to beer bottle caps but not to carbonated water bottle caps.

3.4 The subject-matter of claim 1 may be considered to be distinguished over the disclosure of D1 by the thermoplastic polymer being HDPE.

3.5 D1 discloses on page 2, lines 86 to 112, a number of preferred mixtures of which some include poly α - monoolefine. The description then states on page 3, lines 1 and 2, that a mixture of polyethylene and butyl rubber is a specific example. Further, on page 3, lines 16 to 21, it is explained that the α - monoolefine is preferably polyethylene, especially LDPE. In claim 1 of

D1 there are set out three alternative mixtures of thermoplastic material defined by the general chemical designations of the components. The dependent claims then contain narrowing definitions of these components. In claim 3 it is specified that the poly α - mono-olefine is polyethylene and in claim 4, which depends from claim 3, the polyethylene is specified to be LDPE. In claim 12 it is specified that the thermoplastic material is a mixture of poly α - mono-olefine and a copolymer of butylene with isoprene. This mixture is further specified in claim 17, which is dependent on claim 12, to be a mixture of polyethylene and butyl rubber.

- 3.6 It may be summarised that both the description and claims of D1 specify polyethylene in general and then give LDPE either as a preference or as a dependent claim respectively. From this the Board concludes that the skilled person would understand the teaching of D1 to be that polyethylene in general may be used with, amongst other materials, butyl rubber and that there is a non-exclusive preference for LDPE.

Since the use of polyethylene is clearly not limited to LDPE the Board considers that the skilled person would inevitably consider using HDPE, as an alternative to LDPE, in example 7 of D1. There is no disclosure in D1 which would speak against this for the skilled person. In particular, there is no indication of the need to use any particular properties of LDPE which would not be present in HDPE. The fact that D1 makes it clear that the use of polyethylene is not limited to LDPE would incite the skilled person to consider HDPE.

3.7 Furthermore, there is no evidence for a surprising effect resulting from the use of HDPE. In table 1 of the patent in suit there are two compositions listed which each have 50% HDPE. The difference between these compositions lies in the type of butyl rubber employed. In table 2, which gives the results of oxygen permeation tests on these compositions, one of the HDPE compositions has a particularly good result whilst the other does not. From this it may be concluded that the good result comes from the differing butyl rubber component. In table 3, which gives the results of TCA permeation tests on a number of compositions, one of the compositions contains HDPE but the result for this composition is no different to the results for the compositions containing LDPE. In table 4, which gives the results of venting tests on a number of compositions, three of the compositions contain HDPE in the amounts of 80%, 70% and 50% with other compositions containing the same amounts of LDPE. Only in the case of 50% HDPE is the result better than for mixtures containing LDPE. Even the subsequent description on page 8, lines 1 to 2 concludes that HDPE is only better than LDPE when the butyl content is above 30%.

3.8 It therefore appears that HDPE for one property may be better than LDPE for part of the claimed range. There is, however, no indication of a surprising effect and no indication of an effect which is present over the whole of the claimed range.

The appellant/proprietor has referred in this respect to an affidavit of Mr. J. Skilton dated 12 October 1995 which was filed by the appellant/opponent in the grant proceedings for a European application of the

appellant/opponent. In that affidavit he reports the results of tests carried out on mixtures disclosed in D1. For these mixtures the tests using both LDPE and HDPE have been made. The tests were carried out on examples 2, 4, 7 and 9 of D1, whereby it may be noted that example 2 is a mixture of ethylene/vinyl acetate copolymer with LDPE and hence is not a relevant example. The other examples all contain 50% of LDPE. The results show improvements by the use of HDPE for some tests, i.e. oxygen and TCA transmission resistance. The Board notes however that the tests only concerned HDPE at the value of 50%. If it is desired to prove that a surprising effect has been achieved then this should be proven as occurring throughout the complete claimed range. Therefore, the Board does not consider that the affidavit of Mr. J. Skilton provides adequate proof of a surprising effect.

- 3.9 Therefore, the subject-matter of claim 1 of the main request does not involve an inventive step in the sense of Article 56 EPC.

In view of the above, the prior use as considered by the Opposition Division in the decision under appeal need not be considered by the Board.

Auxiliary request

4. *Article 123(2) EPC*

- 4.1 Compared to claim 1 of the main request the composition of the gasket of claim 1 of this request is limited to consisting of butyl rubber and HDPE. In the tables mentioned in the patent in suit already quoted above in

this respect for the main request the HDPE compositions were in each case compositions consisting only of butyl rubber and HDPE. Also on page 5, lines 25 to 27 of the patent specification it is indicated that the preferred composition is formed "substantially only of polyethylene and butyl rubber". The combination of this disclosure and the fact that each HDPE example only comprises HDPE and butyl rubber would lead the skilled person to conclude that the preference is for the composition containing HDPE to contain only HDPE and butyl rubber. Hence, since the relevant parts of the patent specification have their counterparts in the application as filed, this feature is considered disclosed in the latter.

4.2 The Board therefore concludes that claim 1 of this request complies with Article 123(2) EPC.

5. *Article 83 EPC*

5.1 The conclusion reached by the Board with respect to the main request also applies to this request since the parts of the description to which reference was made with respect to the main request disclose compositions consisting of only butyl rubber and HDPE.

Also, the Board's reasons for the Board not following the arguments of the appellant/opponent with respect to the experimental results disclosed in US-A-5 731 053 still apply to this request.

5.2 The Board therefore concludes that the patent as amended according to this request complies with Article 83 EPC.

6. *Inventive step*

6.1 As already indicated above, compared to the main request claim 1 of this request is limited to the composition consisting only of butyl rubber and HDPE. For the main request the starting point for the discussion of inventive step is example 7 of D1. The composition given in example 7 consists only of 50% butyl rubber and 50% LDPE so that the feature added to claim 1 does not distinguish the subject-matter of this claim further from D1. As a result the same conclusions regarding inventive step apply to claim 1 of the present request.

6.2 Therefore, the subject-matter of claim 1 of the auxiliary request does not involve an inventive step in the sense of Article 56 EPC.

Order

For these reasons it is decided that:

I. Regarding the appeal of the appellant (patentee):

The appeal is dismissed.

II. Regarding the appeal of the appellant (opponent):

1. The decision under appeal is set aside.

2. European patent No 0 599 356 is revoked.

The Registrar:

The Chairman:

G. Nachtigall

H. Meinders