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**D E C I S I O N
of 21 May 2003**

Case Number: T 0751/00 - 3.3.8

Application Number: 91916765.0

Publication Number: 0550526

IPC: C07H 13/06

Language of the proceedings: EN

Title of invention:
Polyol polyester synthesis

Patentee:
THE PROCTER & GAMBLE COMPANY

Opponent:
Unilever N.V.

Headword:
Polyol fatty acid esters/PROCTER & GAMBLE

Relevant legal provisions:
EPC Art. 123(2)(3), 83, 54, 56, 84
EPC R. 57a

Keyword:
"Added subject-matter; extension of the scope of protection -
no"
"Clarity - yes"
"Sufficiency of disclosure - yes"
"Novelty - yes"
"Inventive step - yes"

Decisions cited:
G 0004/92, G 0004/93, T 0016/87, T 0019/90

Catchword:
-



Case Number: T 0751/00 - 3.3.8

D E C I S I O N
of the Technical Board of Appeal 3.3.8
of 21 May 2003

Appellant: Unilever N.V.
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Decision under appeal: Interlocutory decision of the Opposition Division
of the European Patent Office posted 25 May 2000
concerning maintenance of European patent
No. 0 550 526 in amended form.

Composition of the Board:

Chairman: F. L. Davison-Brunel
Members: T. J. H. Mennessier
M. B. Günzel

Summary of Facts and Submissions

- I. European patent No. 0 550 526 with the title "Polyol polyester synthesis" was granted with 10 claims on the basis of the international patent application No. PCT/US91/06168 published under No. WO 92/04360.

Claim 1 as granted read as follows:

"1. A process for preparing highly esterified polyol fatty acid polyester by interesterfying polyol containing more than four esterifiable hydroxy groups and fatty acid ester of easily removable alcohol in heterogeneous reaction mixture, said process comprises an initial and a final stage, characterized in that said final stage of the reaction is carried out under conditions that at least approach plug-flow, including batch conditions, after the degree of esterification of said polyol is at least 50%, and said easily removable alcohol is removed."

Dependent claim 2 related to nine improvements of the method of claim 1, to be carried out alone or in combination with each other. Claims 3 to 8 related to specific combinations of improvements. Claims 9 and 10 related to further embodiments of the processes of claims 2 to 8.

- II. An opposition was filed under Article 100(a) EPC (lack of novelty, lack of inventive step) and Article 100(b) EPC (lack of sufficient disclosure). The Opposition Division maintained the patent in amended form on the basis of the amended main request then on file.

Claim 1 of said request read as follows:

"1. A process for preparing highly esterified polyol fatty acid polyester by interesterfying polyol containing more than four esterifiable hydroxy groups and fatty acid ester of easily removable alcohol in heterogeneous reaction mixture, said process comprises an initial and a final stage, characterized in that said initial stage of the reaction is carried out under backmixing conditions, to maintain a level of lower partial fatty acid esters of said polyol in an emulsifying amount and said final stage of the reaction is carried out under conditions that at least approach plug-flow after the degree of esterification of said polyol is at least 50%, and said easily removable alcohol is removed."

Claim 2 corresponded to granted claim 2 with a minor modification being introduced in improvement (9) to take into account that part of this improvement was now comprised in granted claim 1. Claims 3 to 10 remained as granted.

- III. The Appellants (Opponents) filed an appeal, submitted a statement of grounds of appeal and paid the appeal fee.
- IV. The Respondents (Patentees) answered to the Appellants' submissions and submitted two auxiliary requests in addition to the request accepted by the Opposition Division as main request.
- V. The Board sent a communication under Article 11(2) of the Rules of Procedure of the Boards of Appeal (RPBA), informing the parties of its preliminary, non-binding opinion.

VI. With their letter dated 17 April 2003, the Respondents submitted four new auxiliary requests together with additional arguments on the issues of novelty and inventive step.

Claim 1 of the fourth auxiliary request read as follows:

"1. A process for preparing highly esterified polyol fatty acid polyester by interesterifying polyol containing more than four esterifiable hydroxy groups and fatty acid ester of easily removable alcohol in heterogeneous reaction mixture, said process consists of an initial and final stage, characterized in that said initial stage of the reaction is carried out under backmixing conditions, to maintain a level of lower partial fatty acid esters of said polyol in an emulsifying amount and by using two backmix reactors in series with the product of the first reactor in the initial stage having a degree of esterification of from 30% to 50%, and the product of the second reactor in the initial stage having a degree of esterification of from 50% to 60%, and said final stage of the reaction is carried out under conditions that at least approach plug-flow after the degree of esterification of said polyol is at least 50%, and said easily removable alcohol is removed."

VII. With their letter dated 7 May 2003, the Appellants informed the Board that they would not take part in the oral proceedings.

VIII. At oral proceedings which took place on 21 May 2003, the Respondents replaced all requests on file by one main request. The claims of this request were the same as the claims of the fourth auxiliary request submitted with the letter dated 17 April 2003, with the introduction of the wording "in a continuous reactor" in claim 1:

"1. A process for preparing highly esterified polyol fatty acid polyester by interesterifying polyol containing more than four esterifiable hydroxy groups and fatty acid ester of easily removable alcohol in heterogeneous reaction mixture, said process consists of an initial and final stage, characterized in that said initial stage of the reaction is carried out under backmixing conditions, to maintain a level of lower partial fatty acid esters of said polyol in an emulsifying amount and by using two backmix reactors in series with the product of the first reactor in the initial stage having a degree of esterification of from 30% to 50%, and the product of the second reaction in the initial stage having a degree of esterification of from 50% to 60%, and said final stage of the reaction is carried out **in a continuous reactor** under conditions that at least approach plug-flow after the degree of esterification of said polyol is at least 50%, and said easily removable alcohol is removed." (emphasis added by the Board).

Claim 2 corresponded to granted claim 2 with the minor amendment that the improvement No. (9) was deleted as it was now found in claim 1 on which claim 2 depended. Claims 3 to 9 were as granted.

IX. The documents mentioned in the present decision are:

(1): EP-A-0 383 404,

(2): EP-A-0 322 971.

X. The Appellants' arguments in writing may be summarized as follows:

Article 83 EPC; sufficiency of disclosure

It remained completely unclear in the patent as granted or in the patent as maintained how the "conditions that at least approach plug-flow" (claim 1) could be achieved. The information in the specification was insufficient to perform the process as claimed. None of the examples illustrated the alleged invention.

Article 56 EPC; inventive step

The closest prior art was document (1) which disclosed a process for the interesterification of polyol wherein an initial stage was performed under backmix conditions and a final stage under plug-flow conditions. The initial stage was performed until a degree of esterification of, in general, 2 to 60% was reached. The claimed invention represented a selection invention concerning the conditions under which the claimed process was to be carried out, more particularly a selection of the degree of esterification to be reached in the initial stage. The yields of polyol fatty acid ester thus obtained were no different from the yields

obtained by the process illustrated in document (1). In the absence of specific technical advantages associated to the selection, inventive step had to be denied.

- XI. The Respondents' arguments in writing and during oral proceedings may be summarized as follows:

Article 83 EPC; sufficiency of disclosure

The Appellants' objection that the skilled person would not know how to reach "conditions which at least approach plug-flow" was unjustified as the patent specification, page 10, lines 1 to 9 gave clear indications as to the apparatus and to the relative concentrations of ester reactant to esterifiable polyol to be used to achieve said reaction conditions.

Article 56 EPC; inventive step

The closest prior art was document (1) which disclosed a process for the interesterification of polyols comprising an initial and a final stage. On page 4, line 53 onwards, the duration of the initial stage was considered to be a key factor to minimize the risk of non-participating polyol and, thus, to obtain good yields of a clean product.

Starting from said closest prior art, the problem to be solved could be defined as optimizing the process therein described.

The claimed solution comprised carrying out the initial stage in two steps, up to a degree of esterification of 60% and carrying out the final stage in a continuous reactor under conditions approaching plug-flow.

Although comprised within the general range mentioned in document (1), (2 to 60%), a degree of esterification of up to 60% in the first stage was clearly not preferred according to the teaching of said document. All to the contrary, lower degrees of esterification were consistently referred to as being most favourable and in all of the examples the initial stage was carried out to a degree of esterification of no more than 41%. In addition, the skilled person would not think of carrying out a plug-flow reaction in a continuous reactor. Accordingly, the teaching of document (1) was not detrimental to inventive step.

XII. The Appellants requested that the decision under appeal be set aside and that the patent be revoked.

The Respondents requested that the decision under appeal be set aside and that the patent be maintained with the claims and description, pages 2, 3, 9 and 10, filed during the oral proceedings, other pages of the description as in the "Druckexemplar" attached to the decision of the Opposition Division.

Reasons for the Decision

Admissibility of the main request

1. The main request filed at oral proceedings corresponds to the fourth auxiliary request filed by the Respondents in answer to the Board's communication under Article 11(2) RPBA concerning, in particular, claim 1 as accepted by the Opposition Division. Compared to this earlier claim (section II, above), claim 1 of the main request (section VIII, above) carries amendments which are meant to take into account the concerns which the Board expressed under novelty and inventive step. The main request is, thus, allowable under Rule 57a EPC.
2. By comparing the process of claim 1 now on file to that of claim 1 as maintained by the Opposition Division, it is readily apparent that the amendments introduced by the Respondents do not result in the claimed subject-matter extending beyond that allowed by the Opposition Division. Thus, the main request is in accordance with the principle laid down in the decision G 4/93 of the Enlarged Board of Appeal (OJ EPO 1994, 875) concerning the allowability of further requests made by a Patent Proprietor when the Opponent is the sole Appellant.
3. In accordance with the decision of Enlarged Board of Appeal G 4/92 (OJ EPO 1994, 149), "a decision against a party who has been duly summoned but who fails to appear at oral proceedings may not be based on facts put forward for the first time during those oral proceedings". Here, the filing of the main request at oral proceedings cannot be assimilated to a fact put forward for the first time at oral proceedings because,

as mentioned in point 1 above, the corresponding request (section VI, above) was already filed on 17 April 2002, ie more than one month before the oral proceedings. As for the added feature in claim 1 characterising the final stage in the process ("in a continuous reactor"), its introduction into the claim is in direct answer to the Appellants' objection that said final stage was not sufficiently characterized and, thus, it could not come as a surprise.

4. For these reasons, the main request is admitted into the proceedings.

Article 123(2)(3) EPC; added subject-matter; scope of the claims

5. The subject-matter of claim 1 finds a basis in the application as filed, in the process described on page 2, lines 29 to 36, page 4, lines 8 to 29 and page 21, lines 27 to 33. The claim fulfills the requirements of Article 123(2) EPC.
6. The protection conferred by claim 1 is not enlarged compared to that conferred by granted claim 1 as the steps of both the initial and the final stages are now defined in more specific terms than before. The requirements of Article 123(3) EPC are fulfilled.

Article 84 EPC; clarity

7. The amendments carried out in claim 1 serve to characterize the initial and final stages of the claimed process in such a way that the skilled person

could not be in doubt as to what the additional claimed features are. The requirements of Article 84 EPC are fulfilled.

Article 83 EPC; sufficiency of disclosure

8. The patent specification comprises a generic description of the interesterification reaction on page 11, lines 13 to 35, including the initial concentrations of polyol, fatty acid ester, emulsifier and catalyst, the relevant temperatures in both stages of the reaction as well as the way to remove the volatile alcohol. They are no less than 16 examples illustrating which conditions would be most favourable in either of the initial or of the final stages, including the use of more than one reactor in the initial stage (example 13) or the use of a continuous reactor in the second stage (example 12). Admittedly, the whole process comprising the two stages carried out under the claimed conditions, in particular, of esterification is not exemplified. The Respondents argue that this process is the one which is de facto used on an industrial scale to produce polyol fatty acid esters.

9. When objecting lack of sufficient disclosure, the onus of proof is on the Opponents to show that the claimed invention could not be carried out (see for example, decision T 16/87, OJ EPO 1992, 212). In contrast, the Appellants stated in the grounds of appeal that they "had the opinion that for a man skilled in the art, the information in the specification is insufficient to perform the process as claimed", yet, they failed to provide any evidence to back-up this opinion. In accordance with the case law of the Boards of Appeal

(see for example, T 19/90, OJ EPO 1990, 476), mere assumptions that a claimed subject-matter would not be reproducible are not sufficient to lead to a conclusion of lack of reproducibility.

10. In view of the technical teaching provided in the patent specification and in absence of any evidence to the contrary, it is concluded that the requirements of Article 83 EPC are fulfilled.

Article 54 EPC; novelty

11. There are no documents on file describing a process for the interesterification of polyols comprising an initial stage characterized by two steps with a maximum degree of esterification of 50% to 60%, and a final stage to be carried out in a continuous reactor under conditions approaching plug-flow. Novelty is acknowledged.

Article 56 EPC; inventive step

12. The closest prior art is document (1). Said document discloses a process for the synthesis of polyol fatty-acid esters by reacting a polyol and a fatty-acid lower-alkyl ester characterized in that said process comprises an initial stage carried out under back-mixing conditions until the polyol conversion lies within the range of from 2 to 60% (page 3, lines 29 to 31) and a final stage which may be carried out under conditions approaching plug-flow (batchwise, page 4, line 57).

13. Starting from the closest prior art, the problem to be solved may be defined as setting up an alternative process for the production of polyol fatty acid esters.
14. The solution provided is a process which also comprises two stages. The first stage comprises two steps, each carried out in a different reactor and to a specific degree of esterification: from 30% to 50% in the first reactor and from 50% to 60% in the second reactor. The second stage is carried out under conditions approaching plug flow in a continuous reactor.
15. Document (1) nowhere suggests that the two-stages process which it describes could be in any way altered, let alone that modifications could be carried out at the initial stage. Neither does document (2) which is concerned with the pressure to be applied in an initial stage comprising one step. All other documents on file concerned with the interesterification of polyol refer to processes comprising only one stage.
16. At oral proceedings, the Respondents argued that the modification of the initial stage according to the claimed process resulted in an optimization of the reaction conditions, increasing the ability to dissolve the polyol and, thus, providing an outgoing product essentially composed of partially esterified polyol and free of polyol *per se*. They submitted that this way to proceed was an efficient way to avoid charring. In the patent (page 9, lines 51 to 54), further advantages are pointed out in relation to carrying out the initial stage in more than one reactor, such as the possibility of sequential esterification with different fatty acid

chain length, a better control of the variables influencing the course of the reaction such as temperature, sparging rate.

17. For the reasons given in points 15 and 16 above, inventive step is acknowledged.
18. The Board is satisfied that the amendments carried out on page 2, 3, 9 and 10 of the "Druckexemplar" as accepted by the Opposition Division are suitable to put the description in line with the patentable main request.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the Opposition Division with the order to maintain the patent with the claims and description, pages 2, 3, 9 and 10 filed during the oral proceedings, other pages of the description, including page 2a, as in the "Druckexemplar" accepted by the Opposition Division.

The Registrar:

The Chairman:

G. Rauh

F. Davison-Brunel