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Datasheet for the decision of 20 September 2018

Case Number: T 1949/15 - 3.3.03

Application Number: 07021437.4

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IPC: C08G63/00

Language of the proceedings: EN

Title of invention:
Process for the preparation of polyether-ester polyols

Patent Proprietor:
Covestro Deutschland AG

Opponent:
BASF SE

Relevant legal provisions:
EPC Art. 108, 56

Keyword:
Admissibility of appeal - appeal sufficiently substantiated (yes)
Inventive step - (no) - all requests

Decisions cited:
J 0022/86, T 0162/97, T 0213/85, T 0846/01

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Case Number: T 1949/15 - 3.3.03

D E C I S I O N
of Technical Board of Appeal 3.3.03
of 20 September 2018

Appellant: (Opponent)	BASF SE 67056 Ludwigshafen (DE)
Representative:	Herzog, Fiesser & Partner Patentanwälte PartG mbB Isartorplatz 1 80331 München (DE)
Respondent: (Patent Proprietor)	Covestro Deutschland AG Kaiser-Wilhelm-Allee 60 51373 Leverkusen (DE)
Representative:	Levpat c/o Covestro AG Gebäude 4825 51365 Leverkusen (DE)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 31 July 2015 concerning maintenance of the European Patent No. 1923417 in amended form.**

Composition of the Board:

Chairman	M. C. Gordon
Members:	D. Marquis
	R. Cramer

Summary of Facts and Submissions

I. The appeal of the opponent lies against the interlocutory decision of the opposition division, posted on 31 July 2015 according to which it was held that European patent number 1 923 417 could be maintained in amended form on the basis of the main request, filed on 20 May 2015.

II. A notice of opposition was filed in which revocation of the patent in its entirety on the grounds of Article 100(a) EPC (lack of novelty, lack of inventive step) was requested.

III. The following documents,*inter alia*, were invoked in the decision of the opposition division and are relevant to the present appeal proceedings:

E3: W099/31040 A1 (Henkel KGaA)
E4: DE 19812174 (BASF AG)
E5: US 2003/0191274 A1 (Kurth et al.)
E8: "Chemistry and Technology of Polyols for Polyurethanes", M. Ionescu, pages 326 and 324 (Rapra Technology Ltd. 2005)
Annex A: Letter dated 16 March 2009 by Bayer MaterialScience AG submitted during the examination proceedings.

IV. The decision of the opposition division was announced at the oral proceedings on 6 July 2015. The main request filed with letter of 20 May 2015 contained four claims, claims 1, 3 and 4 reading:

"1. A process for the preparation of polyether-ester polyols, in which starter compounds having zerewitinoff-active hydrogen atoms are reacted with

alkylene oxides under base catalysis in the presence of fatty acid glycerides to give polyether-ester polyols, wherein fatty acid glycerides in which the fatty acid radicals contain no free OH groups are employed, and in which the basic catalyst is an amine."

"3. A polyether-ester polyol, obtainable by a process as claimed in one of claims 1 to 2."

"4. The use of polyether-ester polyols as claimed in claim 3 for the preparation of polyurethanes."

The decision of the opposition division, insofar as relevant to the present decision, can be summarised as follows:

(a) The subject matter of claims 1 and 2 (process), claim 3 (product by process) and claim 4 (use) was novel over E1, E4 and E5. With regard to claim 1, E4 disclosed in a general manner (claim 1 and column 3, lines 55-63) a process wherein the fatty acid triglyceride was reacted in a one-pot/one-step process with compounds having active hydrogen and an alkylene oxide, but did not disclose the use of an amine catalyst. Also, the present process differed from example 4 of E4 in the used catalyst, namely an amine catalyst instead of tetra-n-butyl-titanate.

(b) E4 was the closest prior art document. The skilled person starting from the general teaching of E4 as well as its examples had to select a one-pot/one-step process (1), fatty acid triglycerides containing fatty acid residues having no free hydroxyl group (2) and elect to employ a catalysed reaction (3) in which an amine catalyst was used,

in order to arrive to the claimed process.

(c) The problem underlying the patent in suit was the provision of further polyether-ester polyols which could be employed in polyurethane formulations as components which were reactive towards isocyanates. In view of the examples of the patent in suit, where an amine catalyst was used, it was considered that the technical problem was indeed solved.

(d) The use of an amine catalyst in combination with the specific glyceride as presently claimed and the one-pot/one-step reaction, was the solution to the technical problem.

(e) Even if the skilled person, starting from E4 had selected a one-pot/one-step process (1), fatty acid triglycerides containing fatty acid residues having no free hydroxyl group (2) and a catalysed reaction (3) there was no motivation or indication to use an amine catalyst. The further documents E3, E5 and E8 provided no such indication because E3 and E8 related to reactions involving fatty acid glycerides and E5 only disclosed a two step process.

V. The opponent (appellant) lodged an appeal against the decision.

VI. In its reply to the statement of grounds of appeal, the patent proprietor (respondent) submitted auxiliary requests I to VII.

Auxiliary request I corresponded to the main request from which claims 3 and 4 had been deleted.

In auxiliary request II, claim 1 was amended in that it further defined the claimed process: "said process being a one-pot one-step process".

Auxiliary request III corresponded to auxiliary request II from which claims 3 and 4 had been deleted.

In auxiliary request IV, claim 1 was amended in that it further defined the claimed process: "in which the basic catalyst is an amine selected from the group consisting of N,N-dimethylbenzylamine, dimethylaminoethanol, dimethylaminopropanol, trimethylamine, N,N-dimethylcyclohexylamine, N-methylpyrrolidine, N,N,N',N'-tetramethylethylenediamine, diazabicyclo [2,2,2] octane, 1,4,dimetliylpiperazine, N-methylmorpholine, imidazole, alkyl-substituted imidazole derivatives, N,N-dimethylaniline, 4-(N,N-dimethyl)aminopyridine and partly crosslinked copolymers of 4-vinylpyridine or vinylimidazole and divinylbenzene.".

Auxiliary request V corresponded to auxiliary request IV from which claims 3 and 4 had been deleted.

In auxiliary request VI, claim 1 was amended in that it further defined the claimed process: "in which the basic catalyst is an amine selected from the group consisting of N,N-dimethylbenzylamine, dimethylaminoethanol, dimethylaminopropanol, trimethylamine, N,N-dimethylcyclohexylamine, N-methylpyrrolidine, N,N,N',N'-tetramethylethylenediamine, diazabicyclo [2,2,2] octane, 1,4,dimetliylpiperazine, N-methylmorpholine, imidazole, alkyl-substituted imidazole derivatives, N,N-dimethylaniline, 4-(N,N-dimethyl)aminopyridine and partly crosslinked copolymers of 4-vinylpyridine or

vinylimidazole and divinylbenzene." and "said process being a one-pot one-step process".

Auxiliary request VII corresponded to auxiliary request VI from which claims 3 and 4 were deleted.

VII. In a communication dated 26 July 2018 sent in preparation of oral proceedings, the Board summarised the points to be dealt with and provided a preliminary view on the disputed issues.

VIII. By letter of 20 August 2018, the appellant filed further arguments regarding novelty and inventive step.

IX. Further arguments were also filed by the respondent by letter of 20 August 2018.

X. Oral proceedings were held on 20 September 2018.

XI. The arguments provided by the appellant, as far as relevant to the present decision, can be summarised as follows:

Admissibility of the appeal of the opponent

(a) The appeal was sufficiently substantiated and was therefore admissible. With respect to inventive step, there was only one feature distinguishing the claimed subject matter from example 4 of E4. The only necessity was thus to address the selection of that feature in the prior art documents cited. There was no need to address the part of the decision under inventive step mentioning a hypothetical reasoning about the selection of features.

Main request

Inventive step

(b) Example 4 of E4 was the closest prior art. Since claim 1 of the main request did not explicitly require that the process be carried out in a one-pot/one-step fashion, that feature was not a distinguishing feature. Furthermore, claim 1 did not explicitly require all the components, and in particular the fatty acid glycerides, to react in a single step with one another. Thus, claim 1 differed from the closest prior art only in that an amine was selected as catalyst.

(c) The examples provided in the patent in suit did not establish the presence of an effect resulting from the choice of an amine as catalyst. In particular, examples F and G could not be compared to one another since they not only differed by the catalyst used but also involved different starting compounds. The use of different starting compounds would lead to differences in the structure of the polyether-ester polyols produced. The problem solved was thus the provision of an alternative process for the preparation of polyether-ester polyols.

(d) E3, E5 and E8 already taught the use of amines, and in particular imidazole, as catalyst for the reaction underlying the claimed process. Claim 1 of the main request therefore lacked an inventive step.

Auxiliary requests I-VII

Inventive step

(e) No further arguments were provided for claim 1 of the auxiliary requests other than those already submitted for the main request.

XII. The arguments of the respondent, as far as relevant to the present decision, can be summarised as follows:

Admissibility of the appeal of the opponent

(a) The arguments provided by the appellant in its appeal did not deal with all the reasons upon which the decision under appeal was based. Neither the objection of lack of novelty nor that of lack of inventive step over E4 were sufficiently substantiated. In particular, the arguments of the appellant only dealt with one of three claimed features that distinguished claim 1 over E4, namely the choice of an amine as a catalyst in the claimed process.

(b) While the contested decision referred to a situation for which the skilled person would have considered the selection of all but the amine catalyst within E4, that situation was only hypothetical. It did not establish that there was only one distinguishing feature over E4. On the contrary, the decision made it clear that a threefold selection was necessary in order to arrive at claim 1 of the main request and was formulated in such a manner that it was seen as doubtful that the first two steps would in fact be followed. The statement setting out the grounds of

appeal failed to address that. Thus, even if the appellant were to succeed in his argument limited to the amine catalyst, the outcome of the decision of the opposition division would still remain unchanged since it would be necessary to demonstrate that the first two selections were also obvious, the implication being that they were not. The statement setting out the grounds of appeal was therefore not substantiated with respect to those two other features of claim 1. The appeal was not admissible.

Main request

Inventive step

(c) E4 was the closest prior art and within that document, the process of example 6 of E4 was, from the view of the process features, closer to the claimed process than that of example 4. Example 6 of E4 was thus a better starting point for the assessment of inventive step than example 4. Starting from example 4 however, the claimed subject matter was distinguished by two features, namely the use of a different catalyst system, namely an amine catalyst and the conduct of the process in one step instead of a two step process. Indeed, the formulation of claim 1 of the main request "in the presence of" made clear that all starter compounds had to be present in the same reactor at the same time.

(d) The problem solved in view of example 4 of E4 was the improvement of the propoxylation in the course of the preparation of polyether-ester polymers. None of the prior art documents cited in appeal

would have motivated the skilled person to select an amine catalyst and a one-pot/one-step process in order to arrive at the claimed subject matter. E3 did not concern the same field as the patent in suit. E5 was not relevant as it only concerned processes having a plurality of steps. E8 did not hint at the selection of features as claimed. Claim 1 of the main request was therefore inventive over E4.

Auxiliary requests I-VII

Inventive step

(e) The arguments submitted for the main request also applied to claim 1 of all auxiliary requests.

XIII. The appellant requested that the decision under appeal be set aside and that the European patent No. 1 923 417 be revoked.

XIV. The respondent requested that the appeal be rejected as inadmissible. If the Board would come to the conclusion that the appeal is admissible, it requested that it be dismissed. Alternatively it requested that the decision under appeal be set aside and the patent be maintained on the basis of one of auxiliary requests I to VII, all filed with the reply to the statement of grounds of appeal.

Reasons for the Decision

2. Admissibility of the appeal

2.1 In reply to the statement of grounds of appeal submitted by the opponent, the respondent questioned the admissibility of the appeal for not being sufficiently substantiated (see letter dated 19 April 2016, pages 4 and 5, point I). In particular, the respondent argued that the appeal lacked substantiation because the inventive step arguments of the appellant regarding claim 1 of the main request only dealt with one of three features said in the decision to distinguish the claimed subject matter from that of the closest prior art, failing to address the other two distinguishing features.

2.2 With regard to inventive step, the decision indicated that starting from the general teaching of the closest prior art E4 and its examples, the skilled person wishing to solve the problem of providing further polyether-ester polyols reactive towards isocyanates which could be employed in polyurethane formulations would have had to perform a threefold selection, namely to conduct the process as a one-pot/one-step process, to select fatty acid triglycerides containing fatty acid residues having no free hydroxyl groups and to select an amine as catalyst (passage bridging pages 9 and 10 of the contested decision). In the view of the respondent, no credible argument was given in the statement setting out the grounds of appeal why the skilled person would have selected the first two features of that threefold selection in order to arrive

at the claimed subject matter.

2.3 The question with regard to admissibility to be decided here is whether the statement of grounds of appeal filed by the appellant complies with the requirements addressed in the third sentence of Article 108 EPC and in Rule 99(2) EPC. Whether or not these requirements are met depends upon the substance of the document presented as the statement of grounds of appeal.

2.4 According to the established case law of the boards of appeal, the grounds of appeal have to specify the legal and factual reasons why the contested decision should be set aside and the appeal allowed. In particular, the arguments must be clearly and concisely presented to enable the board and the other party or parties to understand immediately why the decision is alleged to be incorrect, and on what facts the appellant bases its arguments, without first having to make investigations on their own. In other words, it must be clear from the statement of grounds of appeal why in the appellant's opinion the contested decision is incorrect (Case Law of the Boards of Appeal, 8th edition 2016, IV.E.2.6.3).

2.5 The examination of whether the requirements of the EPC are met has to be made on the basis of the contents of the statement of grounds of appeal in the light of the reasons given in the contested decision (see, for example, J 22/86, OJ EPO 1987, 280, reasons, 2; T 162/97, reasons, 1.1.2; T 213/85, OJ EPO 1987, 482, reasons 3).

2.6 In the present case, it is clear from the decision under appeal that the opposition division maintained the patent on the basis of the claims of the main request because it was found that claims 1 to 4 met the

requirements regarding novelty (Article 54 EPC) and inventive step (Article 56 EPC) over E4.

2.7 Since the Board had indicated that it was of the preliminary opinion that the novelty attacks put forward by the appellant in the statement setting out the grounds of appeal were not sufficiently substantiated, an opinion that was not contested by the appellant, the question of the admissibility of the appeal depended on whether the attack of inventive step was sufficiently substantiated.

2.8 Inventive step of claim 1 in view of E4 as the closest prior art is addressed in the statement of grounds of appeal (pages 1 to 3) wherein a distinguishing feature over E4 is identified and the question of its technical effect as well as its obviousness in view of the prior art documents E3, E5 and E8 is discussed. In that respect, the statement of grounds of appeal included the legal and factual reasons why the decision under appeal should be set aside with respect to at least one ground, namely lack of inventive step.

2.9 It is true that the reasoning of the appellant with respect to inventive step is not based on the threefold selection of features within the general teaching of E4 as laid out in the contested decision, mentioning instead that the decision had established that claim 1 and E4 differed from one another only in the use of an amine catalyst. The Board does however not find this to be at odds with the contested decision especially because the decision refers on page 5 (first four lines of the last paragraph in view of claim 1 and column 3 of E4) and on page 6 (first paragraph in view of example 4 of E4) to disclosures within E4 allegedly differing from claim 1 of the main request only in the

use of an amine catalyst. In this respect, the Board does not find that the appellant disregarded alleged distinguishing features from his inventive step assessment, as stated by the respondent, but that it instead based its argumentation on a different assessment of the features distinguishing claim 1 of the main request over the closest prior art E4.

2.10 With respect to the contested decision, it is to be noted that the passage on page 10 (first three full paragraphs) referred to as a hypothetical reasoning of the opposition division by the respondent, only establishes that the selection of an amine catalyst was inventive over the cited prior art, seemingly disregarding in this assessment the other two distinguishing features of claim 1 over E4. The respondent implied that these two features, namely the one-pot/one-step reaction and the triglycerides without free hydroxyl groups, would alone justify an inventive step. That however has not been shown to be the case nor did the opposition division conclude or even indicate that an inventive step could be acknowledged on the basis of these two features, either singly or jointly, in its contested decision.

2.11 Decision T 846/01 cited by the respondent, held that, for an appeal to be admissible, at least one of the grounds in the written statement of grounds of appeal had to relate to a point which could at least arguably have been decided in the appellant's favour by the instance appealed from but which point had not been so decided, and such favourable decision on this point would have produced a different outcome (point 1 of the reasons). That statement however was made in the context of an appeal in which the appellant had sought the re-opening of issues of validity of the claims

which had already been decided in an earlier appeal concerning the same case (point 3 of the reasons). The finding of the board was accordingly that an appeal could not be an excuse for requesting consideration of points which the instance appealed from was not entitled to consider and that consequently if the written grounds filed related only to such points the requirements of Article 108 EPC for written grounds of appeal was not fulfilled and the appeal had to be rejected as inadmissible (point 2 of the reasons). Case T 846/01 does therefore not concern the degree of substantiation of an appeal ground and is not found by the Board to be relevant to the present case.

2.12 Having regard to the foregoing, the Board is satisfied that the statement of grounds of appeal sets out in a complete manner why the appellant considered the decision under appeal to be incorrect. Therefore, the appeal is admissible under the terms of Article 108 and Rule 99(2) EPC.

Main request

3. Inventive step

3.1 Both the patent in suit and E4 relate to a process for the preparation of polyether-ester polyols from fatty acid glycerides and hydrogen functional compounds for use in polyurethane preparation (claim 1 and paragraph 1 of the patent in suit; column 1, lines 1 to 8 of E4). E4 was considered as the closest prior art in the decision of the opposition division and was also seen as the closest prior art by both parties in appeal. The Board does not see a reason to depart from E4 as the closest prior art.

3.2 As part of the process for the preparation of polyether-ester polyols according to E4 is an alkoxylation by treatment of the hydrogen functional compounds with alkylene oxides before, after or even during their reaction with the fatty acid glycerides (column 2, lines 39-46). In that last case, the reaction between the fatty acid glycerides and the hydrogen functional compounds is interrupted so that the alkoxylation can be performed (column 3, lines 45-54). Preferred fatty acid glycerides according to E4 are based on natural oils such as soy oil (which bears a fatty acid radical not containing free hydroxyl groups) or castor oil (which bears a fatty acid radical containing free hydroxyl groups) (column 2, lines 54-60). These aspects of the process of E4 are further detailed in the examples, among which example 4 and example 6 were seen as particularly relevant by the parties.

3.2.1 Example 4 describes a process in which soy oil and castor oil are first reacted with glycerol, before alkoxylation is conducted with propylene oxide. It is clear from the description of example 4 that that process is carried out in two reactors since the product of the first reaction, performed in laboratory mixing apparatus, is transferred to an autoclave in order for the alkoxylation to take place (column 5, lines 47 and 52). This constitutes a first distinguishing feature of the claimed subject matter since claim 1 of the main request requires the reaction between the starter compounds having zerewitinoff-active hydrogen atoms and alkylene oxides under base catalysis to be performed in the presence of fatty acid glycerides, thereby defining a process which can be characterized as a one-pot/one-step process.

3.2.2 Furthermore, while the first step of the process according to example 4 is carried out in the presence of tetra-n-butyltitanate as catalyst, which is used as a transesterification catalyst (column 4, lines 12-20), the alkoxylation reaction with propylene oxide carried out in the second step does not appear to involve a catalyst. Thus, the use of an amine base catalyst for the reaction of alkylene oxides as required in claim 1 of the main request is a further distinguishing feature in view of example 4 of E4.

3.2.3 Example 6 describes a process in which castor oil is reacted with trimethylol propane in the presence of propylene oxide and potassium hydroxide as a catalyst. The process of claim 1 of the main request differs from example 6 in that it must involve a fatty acid radical containing no free hydroxyl group and in that the alkoxylation reaction must be performed with an amine catalyst.

3.3 On the basis of the distinguishing features noted above, both examples 4 and 6 represent equally relevant starting points for the assessment of inventive step of claim 1 of the main request. It must now be determined which problem was solved by the claimed subject matter. To that effect, the respondent referred to examples F and G of the patent in suit as well as to Annex A.

3.3.1 Example F (paragraph 82) discloses a process for the preparation of a polyether-ester polyol in which glycerol, soy oil, sucrose and propylene oxide are reacted according to a one-pot/one-step process in the presence of imidazole as a catalyst. Example G also discloses a one-pot/one-step process for the reaction of sucrose, soy oil and propylene oxide. The catalyst system used in that example does not contain an amine

but consists of two polymeric alkoxylates.

3.3.2 It was submitted by the respondent that a comparison of the products obtained from examples F and G established the presence of an improvement related to the specific use of an amine catalyst. In order to establish such an improvement in the present case however, it would have to be shown that the alleged improvement was directly and causally related to the distinguishing feature, i.e. the use of an amine catalyst. The processes of examples F and G however not only differ from one another by the catalysts employed, but also differ in the nature and the amounts of the reacting compounds, which ultimately have an impact on the structure of the polyether-ester polyols produced and therefore their properties. Indeed, example F is carried out on a mixture of glycerol and sucrose as compounds having zerewitinoff-active hydrogen atoms whereas in the process of example G, only sucrose is used. The relative amounts of some reactants are also substantially different in examples F and G. Thus, while the amount in soy oil is approximatively the same in both examples (2245.3g in example F and 2058.1g in example G), the amount of compounds having zerewitinoff-active hydrogen atoms is nearly twice as much in example F (633g+948.7g=1581.7g) as in example G (870.7g) and the amount in propylene oxide used is also higher in example F (2167.5g) compared to example G (1525.5g). Since it is to be expected that these significant differences will have an influence on the structure of the produced polyether-ester polyols as well, it cannot be concluded that any effect determined on these polymers can be directly and causally linked to the nature of the selected catalyst. The Board concluded therefrom that examples F and G of the patent

in suit cannot establish the presence of any effect linked to the distinguishing feature.

3.3.3 Annex A was also cited by the respondent at the oral proceedings before the Board as evidence of an improvement in the claimed process. However, the experiments provided in that annex cannot demonstrate any benefits of using an amine catalyst as compared to other catalysts since all experiments of Annex A were conducted in the presence of an amine catalyst, namely imidazole.

3.3.4 Furthermore, since examples F and G of the patent in suit and the examples of Annex A were all carried out as one-pot/one-step process, none of these examples can establish the presence of an effect directly linked to a one-pot/one-step process as claimed over a two step process as it is disclosed in example 4 of E4.

3.3.5 The Board concludes from the above that neither examples F and G of the patent in suit nor the examples of Annex A are suitable to demonstrate the presence of a technical effect arising from the use of an amine catalyst or the conduct of the reaction as a one-pot/ one-step process. The evidence provided does also not support the presence of an effect resulting from the combination of the features of a one-pot/one-step process and the use of an amine alkoxylation catalyst. That argument was also not made by the respondent. Under these circumstances, the sole problem that can be formulated is the provision of a further process for the preparation of polyether-ester polyols.

3.4 It remains to be determined whether the solution defined according to claim 1 of the main request is inventive in view of the cited prior art. To that

extent, the question to be answered is whether the skilled person, starting from E4 and seeking to solve the problem as formulated above would be led to the claimed process by the available prior art.

3.5 In particular, starting from example 4 of E4, the question is whether a skilled person would have considered performing the preparation of polyether-ester polyols according to a one-pot/one step process and would have used an amine catalyst for the alkoxylation reaction.

3.5.1 With respect to the preparation of the polyether-ester polyols, the description of document E4 contemplates three modes of realisation of the process (column 3, lines 45-68). A first mode in which the alkoxylation is performed before the transesterification (lines 45-54), a second mode in which the alkoxylation is carried out during the transesterification (lines 55-62) and a third mode in which the transesterification is performed first, followed by the alkoxylation in a second step (lines 64-68). While the second mode according to that passage of E4 corresponds to a process in which the starter compounds having active hydrogen atoms are reacted with alkylene oxides in the presence of fatty acid glycerides as required in claim 1 of the main request (a one-pot/one-step process), the third mode corresponds to the process of example 4 of E4. While E4 suggests that the first mode is preferred (line 45), the second and third modes are presented as equally acceptable (lines 55 and 64). E4 thus teaches that the preparation process can either be carried out as a one-pot/one-step process or in two steps as in example 4. Under these circumstances, the Board finds that a skilled person would have considered a one-pot/one-step process as an alternative to the two

step process of example 4.

3.5.2 With regard to the alkoxylation reaction, as reported in the closest prior art E4, it is generally known that it can be performed catalysed or uncatalysed (column 3, lines 38-44). In that respect, E4 suggests the use of potassium and/or calcium hydroxide as alkoxylation catalysts. Among the documents cited in appeal, E8 is an excerpt of a textbook on the chemistry and technology of polyols for polyurethanes. The teaching of E8 is thus relevant to the patent in suit and to document E4 since E8 relates to the preparation of polyols for polyurethanes. The first (partial) paragraph on page 326 of E8 discloses that the most important catalysts used in industrial practice are alkali hydroxides and tertiary amines. This teaching establishes that alkoxylation catalysts as mentioned in E4 (column 3, line 41) and tertiary amine catalysts were known to the skilled person to be suitable catalysts for alkoxylation reactions. Section 13.1.1 of E8, relating more specifically to the tertiary amine alkoxylation catalysis of hydroxyl groups further discusses the reactivity of tertiary amine catalysts and identifies the group of aromatic amines of very high catalytic efficiency, in particular imidazole, in the polyaddition reaction of propylene oxide (PO) to hydroxyl groups. E8 therefore teaches the use of tertiary amine catalysts such as imidazole as an alternative alkoxylation catalyst to alkali hydroxide catalysts in general.

3.5.3 Document E5, which is also in the field of polyol preparation for polyurethanes (paragraph 12), confirms the teaching of E8 since it discloses that propoxylation of transesterified polyols of vegetable oils is typically carried out in the presence of

triethylamine, trimethylamine or other suitable amines as well as potassium hydroxide (paragraph 22). Even if the process disclosed in E5 is a two step process, the teaching relating to the nature of the alkoxylation catalyst is not limited in any way to a two step process. There is thus no reason why a skilled reader would not have applied that teaching to a one-pot/one-step process.

3.5.4 In view of the teaching provided in E8 and E5, a skilled person would have considered tertiary amines in general and imidazole in particular as an alternative to alkoxylation catalysts such as potassium hydroxide mentioned in E4.

3.5.5 Furthermore, the passages relating to the choice of the mode of operation of the transesterification and alkoxylation reactions on the one hand and the nature of the alkoxylation catalyst on the other hand in the description of the process in E4 are largely independent of one another. There is also no teaching in E4 suggesting that the selections of these two features would be mutually exclusive. The Board concludes that a skilled reader of E4 would have considered the operation of the process as a one-pot/one-step process and the choice of an amine alkoxylation catalyst in combination as an obvious solution to the problem posed, namely the provision of a further process for the preparation of polyether-ester polyols.

3.6 The subject matter of claim 1 of the main request therefore lacks an inventive step in view of the closest prior art E4. The main request does not satisfy the requirements of Article 56 EPC.

Auxiliary requests

4. Inventive step

4.1 Auxiliary request I differs from the main request in that claims 3 and 4 have been deleted. Claim 1 of auxiliary request I is thus identical to claim 1 of the main request and lacks an inventive step for the same reasons as claim 1 of the main request.

4.2 Claim 1 of auxiliary request II differs from claim 1 of the main request in that the process is further defined as "being a one-pot one-step process". As however mentioned established in point 3.2.1 above, claim 1 of the main request was already considered as being limited to a "one-pot/one-step" process. Since claim 1 of auxiliary request II does not contain additional distinguishing features as compared to claim 1 of the main request, that claim too lacks an inventive step for the same reasons as claim 1 of the main request.

4.3 Auxiliary request III differs from auxiliary request II in that claims 3 and 4 have been deleted. Claim 1 of auxiliary request III is thus identical to claim 1 of auxiliary request II and lacks an inventive step for the same reasons as the main request.

4.4 Claim 1 of auxiliary request IV differs from claim 1 of the main request in that the alkoxylation catalyst is further defined as an amine basic catalyst selected in a list comprising among others, imidazole. As however established for the main request in point 3.5.2 above, the selection of imidazole as an amine catalyst is taught in document E8 and thus does not involve an inventive step.

4.5 Auxiliary request V differs from auxiliary request IV in that claims 3 and 4 have been deleted. Claim 1 of auxiliary request V is thus identical to claim 1 of the auxiliary request IV and lacks an inventive step for the same reasons as the main request.

4.6 Auxiliary request VI differs from claim 1 of the main request in that the process is further defined as "being a one-pot one-step process" and the alkoxylation catalyst is further defined as an amine basic catalyst selected in a list comprising among others, imidazole. As established for the main request in points 3.2.1 and 3.5.2 above, the selections of a one-pot one-step process and of imidazole as an amine catalyst cannot be seen as inventive, nor is the combination of these two features within E4, as shown in point 3.5.5. Claim 1 of auxiliary request VI lacks therefore an inventive step for the same reason as the main request.

4.7 Auxiliary request VII differs from auxiliary request VI in that claims 3 and 4 have been deleted. Claim 1 of auxiliary request VII is identical to claim 1 of the auxiliary request VI and lacks an inventive step for the same reasons.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The patent is revoked.

The Registrar: The Chairman:

B. ter Heijden M. C. Gordon

Decision electronically authenticated