

UNITED STATES PATENT AND TRADEMARK OFFICE

**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Ex parte BERND GUTTES, KATHRIN HARRE, GOTTFRIED KNORR,
MARITA SCHUSTER, and MONIKA WETTERLING

Appeal 2008-1768
Application 10/495,199
Technology Center 1600

Decided: April 3, 2008

Before DONALD E. ADAMS, ERIC GRIMES, and JEFFREY N.
FREDMAN, *Administrative Patent Judges*.

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DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 involving claims to a method for the production of a polyether alcohol and the resultant product which the Examiner has rejected as anticipated. We have jurisdiction under 35 U.S.C. § 6(b). We affirm.

Background

“The synthesis of polyether alcohols by the reaction of H-functional initiators, particularly alcohols and primary and/or secondary amines, with alkylene oxides is well-known.” (Spec. 1). The Specification notes that “traces of these amines used as catalysts frequently interfere with the subsequent conversion of the polyether alcohols to polyurethanes” (Spec. 1).

Appellants teach a

process for the production of polyether alcohols using amine catalysts, which process gives high space-time yields and avoids side reactions as far as possible and in which the catalysts remain in the polyether alcohol following the reaction and can act as catalysts when use is made of said polyether alcohols for the production of polyurethanes.

(Spec. 2.)

Statement of the Case

The Claims

Claims 1-6 are on appeal. We will focus on claims 1 and 4, which are representative and read as follows:

1. A process for the production of a polyether alcohol comprising catalytic addition of an alkylene oxide to an H-functional initiator using an amine as catalyst, wherein the addition of the amine to the reaction mixture is carried out prior to or at the commencement of the chemical addition of the alkylene oxide and also at least once during the reaction, said additional addition of the catalyst being effected at the point of the reaction at which there is an increased occurrence of side reactions and/or the alkylene oxide undergoes a change in the polyether chain.

4. A polyether alcohol produced in accordance with the process of any of claims 1 to 3.

The prior art

The Examiner relies on the following prior art references to show unpatentability:

Ulyatt	US 3,357,970	Dec. 12, 1967
Speranza	US 4,228,310	Oct. 14, 1980

The issues

The rejections as presented by the Examiner are as follows:

Claims 1-7 stand rejected under 35 U.S.C. § 102(b), as being anticipated by Ulyatt.¹

Claim 4 stands rejected under 35 U.S.C. § 102(b), as being anticipated by Speranza.

35 U.S.C. § 102(b) rejection over Ulyatt

Appellants argue that Ulyatt “discloses a single addition of an amine to a first reaction followed by another single addition of an amine to a second reaction” (App. Br. 10). Appellants contend that “two independent reactions cannot reasonably be said to be the same as a single chemical reaction” (App. Br. 10). Appellants also argue that Ulyatt “does not teach, disclose, or suggest adding the amine during the reaction at the point of the reaction at which there is an increased occurrence of side reactions and/or the alkylene oxide undergoes a change in the polyether chain” (App. Br. 11).

The Examiner responds that

(1) the claims do not require adding additional amine to the "same" reaction and (2) even if the claims did have this requirement the

¹ The rejection of claim 7 is not on appeal (App. Br. 3).

Examiner believes that Ulyatt does add additional amine to the "same" chemical reaction because in examples V-VII after the first part of the reaction occurs Ulyatt removes a portion of the polyol product and then adds more of the same starter, amine catalyst and alkylene oxide for further reaction.

(Ans. 4.)

The Examiner "disagrees that the reactions disclosed by Ulyatt are independent reactions rather they are separate stages of one reaction. Ulyatt utilizes the same starter, catalyst and alkylene oxide in the second stage of the reaction as he uses in the first stage of the reaction" (Ans. 5-6).

In view of these conflicting positions, we frame the anticipation issue before us as follows:

Does Ulyatt teach a polyether alcohol production process with a second addition of amine "during the reaction"?

Findings of Fact

1. Ulyatt teaches a "method for preparing polyethers from polyhydroxy compounds that contain at least three hydroxy groups in the molecule" (Ulyatt 1:14-16).
2. Ulyatt teaches formation of a polyether product "by reacting a polyhydroxy compound having at least three hydroxy groups in the molecule . . . with an excess in moles of a vicinal lower alkylene oxide in the presence of a strongly basic organic amine catalyst" (Ulyatt 2:12-17).
3. The Specification teaches that the "initiators used are mostly those having at least 4 active hydrogen atoms, preferably at least tetrafunctional alcohols Examples of at least tetrafunctional alcohols are sugar alcohols, such as . . . sucrose" (Spec. 5:28-35).

4. The Specification teaches that the “alkylene oxides used are mostly ethylene oxide and propylene oxide alone or together” (Spec. 5:15-17).

5. Ulyatt teaches an exemplary synthesis in Example V in a stainless steel reaction vessel where “into it were introduced powdered sucrose (7 kg.) and a polyether (6 kg.) of hydroxyl number 420 prepared by reacting powdered sucrose with propylene oxide at 115° C in the presence of dimethylamine as a catalyst” (Ulyatt 5:65-69).

6. Ulyatt teaches that the mixture of Example V “was purged with nitrogen for 45 minutes to remove any dissolved oxygen and 70 g. of dimethylamine were then added. The reaction vessel was heated to 115° C and propylene oxide was introduced” (Ulyatt 5:70-73).

7. Ulyatt teaches regarding Example V that “[i]t was found that this reaction cycle could be repeated as often as desired without any apparent deterioration in the quality of the polyether product” (Ulyatt 6:21-23).

8. Ulyatt teaches, in Example VII, that “powdered sucrose (500 g.), a sucrose/propylene oxide polyether diluent (500 g.) of a hydroxyl number 530 . . . propylene oxide (500 g.), diethylamine (10 g.) and distilled water (10 g.)” were added to a reaction vessel (Ulyatt 7:15-20). This mixture is then “heated to 115° C and [maintained] at this temperature” (Ulyatt 7:20-21). Ulyatt then teaches that after venting excess propylene oxide, “[s]ome of the product was removed and to the remainder (500 g.) were added sucrose (500 g), diethylamine 10 g., propylene oxide (500 g.)

and distilled water (10 g). The vessel was heated to 115° C and maintained at this temperature while reaction was carried out” (Ulyatt 7:31-36).

9. Ulyatt teaches that “it should be pointed out that the polyether diluent employed as the reaction medium here in the continuous process should preferably be one which is derived from the same polyhydroxy starting compound as that which is to be oxyalkylated” (Ulyatt 2:65-69).

10. Ulyatt teaches in claim 3 that “the reaction is conducted as a continuous process by recycling a portion of the polyether reaction product to the reaction mixture to serve as suspension medium for the polyhydroxy compound” (Ulyatt 10:71-74).

Discussion of 35 U.S.C. § 102(b) over Ulyatt

The arguments focus on whether Ulyatt teaches a second addition of an amine catalyst “during the reaction”, where the central disputed claim phrase is “during the reaction”. We begin by analyzing what “during the reaction” means in the context of claim 1, the Specification and the prior art of Ulyatt.

Claim 1 is drawn to a “process for the production of a polyether alcohol” (Claim 1). The process involves the addition of an amine catalyst at two time points in the reaction, one time at the beginning of the reaction and a second time “during the reaction” (*see* Claim 1). Claim 1 indicates that the second time point is functionally placed when “there is an increased occurrence of side reactions and/or the alkylene oxide undergoes a change in the polyether chain” (Claim 1).

Appellants’ Specification indicates that side reactions occur “during the chemical addition of alkylene oxides” (Spec. 3:17-18). The

Specification suggests that “addition of the catalyst must take place before the rate of formation of aldehyde exceeds the value of 100 ppm of aldehyde/100 g of rise in molecular weight” (Spec 3:21-23). Consequently, Appellants’ Specification teaches that addition of the amine catalyst prior to or coincident with the addition of the alkylene oxides will satisfy the functional requirement for preventing side reactions (*see* Spec 3:17-23).

We therefore interpret the claim limitation regarding the addition of the amine catalyst as requiring that the amine catalyst is added prior to or coincident with the addition of the alkylene oxides in order to satisfy the functional requirement of preventing side reactions in claim 1.

The Specification and claim 1 do not, however, define what constitutes a “reaction”. Therefore, in the absence of any specific definition of a “reaction”, we give this term its broadest reasonable interpretation. *See, e.g., In re Hyatt*, 211 F.3d 1367, 1372 (Fed. Cir. 2000) (“[D]uring examination proceedings, claims are given their broadest reasonable interpretation consistent with the specification.”).

Ulyatt does provide some indication of what constitutes a “reaction” (FF 9-10). In claim 3, Ulyatt claims a process where “the reaction is conducted as a continuous process by recycling a portion of the polyether reaction product to the reaction mixture to serve as suspension medium for the polyhydroxy compound” (Ulyatt 10:71-74). Additionally, Ulyatt exemplifies processes in which the reaction involves multiple steps to obtain the final desired polyether compound (*see* FF 5-8). Ulyatt teaches that “[i]t was found that this reaction cycle could be repeated as often as desired

without any apparent deterioration in the quality of the polyether product” (Ulyatt 6:21-23).

We therefore interpret the claim limitation of “during the reaction” as encompassing a “reaction” which is a continuous process of recycling portions of the polyether reaction products as taught by Ulyatt (*see* FF 7, 9-10).

Applying this interpretation to claim 1, Ulyatt teaches a method for preparing polyethers from polyhydroxy compounds (FF 1). Ulyatt teaches catalytic addition of an alkylene oxide to an initiator such as sucrose using an amine as catalyst (FF 2-5). Ulyatt teaches addition of the amine catalyst to the mixture prior to the reaction (FF 5, 8). Ulyatt further teaches, and exemplifies in Examples V-VII, that additional amine catalyst is added to the reaction mixture coincident with or prior to the addition of propylene oxide, the time point indicated by the Specification as necessary to prevent side reactions (FF 6, 8).

Based on the above, we conclude the Examiner has made a prima facie case of anticipation under 35 U.S.C. § 102(b) (FF 1-10).

We reject Appellants’ argument that “two independent reactions cannot reasonably be said to be the same as a single chemical reaction” (App. Br. 10). Claim 1 does not state “during a single chemical reaction” but rather “during a reaction” (*see* Claim 1). From our previous discussion, it is clear that Ulyatt, at least, reasonably treated his cyclic process for polyether synthesis as a “reaction” (FF 7, 9-10). This is most clearly evident from claim 3 of Ulyatt, where he states “the reaction is conducted as a continuous process by recycling a portion of the polyether reaction product

to the reaction mixture to serve as suspension medium for the polyhydroxy compound” (Ulyatt 10:71-74). It is therefore reasonable to interpret the claim term “during a reaction” to encompass the cyclical reaction taught by Ulyatt and we conclude that Ulyatt teaches a reaction within the scope of claim 1 (*see* FF 7, 9-10).

We are not persuaded by Appellants’ argument that “no additional catalyst, *based on the starting material*, is ever added” (App. Br. 10). This is simply incorrect, since Ulyatt expressly teaches addition of a separate amount of the catalyst diethylamine in Example VII after the reaction has initiated and before the final product is obtained (*see* FF 8). Additionally, Ulyatt teaches addition of an initial amount of diethylamine coincident with the start of the reaction process in Example VII (FF 8).

We also reject Appellants’ argument that Ulyatt does not disclose addition “at the point of the reaction at which there is an increased occurrence of side reactions and/or the alkylene oxide undergoes a change in the polyether chain” (App. Br. 11). Ulyatt teaches addition of the diethylamine at the same time that propylene oxide is added (FF 6, 8). As we noted, in interpreting this claim limitation, the Specification teaches that side reactions occur “during the chemical addition of alkylene oxides” (Spec. 3:17-18). Consequently, when Ulyatt teaches addition of the diethylamine immediately prior to addition of the propylene oxide, we conclude that Ulyatt meets the functional requirements of the second catalyst addition of claim 1 (FF 6, 8).

We affirm the rejection of claims 1 as anticipated by Ulyatt. Claims 2-6 fall with claim 1 as they were not separately argued.

35 U.S.C. § 102(b) rejection over Speranza

Appellants argue that for a “102(b) rejection of claim 4, the Examiner must demonstrate that the '310 patent teaches *every* aspect of the claims invention either explicitly or impliedly, as set forth in claims 1, 2, and/or 3, followed by every aspect of the claimed invention as set forth in claim 4” (App. Br. 12). Appellants further contend that because of the difference in process, the resultant product “includes a decreased amount of undesirable by- products, is formed in increased space-time yields, includes a decreased amount of prematurely chain terminated products, and includes residual amine catalyst that can be re-used in the production of polyurethanes” (App. Br. 13).

The Examiner contends that “the polyether alcohol of Speranza et al. appears to be identical to the claimed polyether alcohol because they are made by a similar process and they have similar utility” (Ans. 6). The Examiner also argues that “Appellants have not provided any evidence that the polyether alcohol of Speranza et al. is different from the claimed polyether alcohol” (Ans. 6).

In view of these conflicting positions, we frame the anticipation issue before us as follows:

Are the products of claim 4 and the products of Speranza identical or substantially identical?

Findings of Fact

11. The Specification teaches “production of polyether alcohols” (Spec. 2:22). The Specification does not provide any structural

characteristics of the resultant polyether alcohols that distinguish them from those produced by Speranza (Spec. 6-10).

12. Speranza teaches polyether alcohols formed using an alkylene oxide and a catalyst such as an amino phenol (*see* Speranza 1:27-68).

Discussion of 35 U.S.C. § 102(b) over Speranza

The controlling case law for product by process claims is *Best*, in which the court notes “[w]here, as here, the claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes, the PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his claimed product”. *In re Best*, 562 F.2d 1252, 1255 (CCPA 1977).

Applying *Best* to the current facts, we conclude that Appellants have not identified any specific structural feature of the polyether alcohol product of claim 4 which is different than the polyether alcohol of Speranza (FF 11-12). In *Spada*, the court noted with approval that

The Board held that the compositions claimed by Spada ‘appear to be identical’ to those described by Smith. While Spada criticizes the usage of the word ‘appear’, we think that it was reasonable for the PTO to infer that the polymerization by both Smith and Spada of identical monomers, employing the same or similar polymerization techniques, would produce polymers having the identical composition.

In re Spada, 911 F.2d 705, 708 (Fed. Cir. 1990). We think the same reasoning applies to the instant facts, where the chemical reactions of Speranza and claim 4 use similar techniques and the products therefore

appear to be identical. The Examiner applied Speranza in the initial March 27, 2006 Office action in this prosecution. Therefore, Appellants have had the opportunity to provide rebuttal evidence, rather than argument, to demonstrate that the compounds of Speranza differed from those of claim 4 in response to that Office action. No such evidence is of record in the current appeal (*see* App. Br. Evidence Appendix). The Examiner's initial Office action served to place Appellants on notice that they needed "to prove that the prior art products do not necessarily or inherently possess the characteristics of his claimed product." *Best*, 562 F.2d at 1255. Appellants did not meet this burden of production.

We therefore affirm the rejection of claim 4 as anticipated by Speranza.

CONCLUSION

In summary, we affirm the rejection of claim 1 over Ulyatt under 35 U.S.C. § 102(b). Pursuant to 37 C.F.R. § 41.37(c)(1)(vii)(2006), we also affirm the rejections of claims 2-6 as these claims were not argued separately. We also affirm the rejection of claim 4 over Speranza.

Appeal 2008-1768
Application 10/495,199

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv)(2006).

AFFIRMED

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BASF AKTIENGESELLSCHAFT
CARL-BOSCH STRASSE 38, 67056 LUDWIGSHAFEN
LUDWIGSHAFEN 69056 DE GERMANY