UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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*Ex parte* RICHARD R. ROESLER, YULIYA BEREZKIN, CAROL L. KINNEY, KYLI MARTIN, MYRON W. SHAFFER, POLI C. YU, DOROTA GRESZTA-FRANZ, REINHARD HALPAAP, and JOACHIM PETZOLDT

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Appeal 2008-4026
Application 10/970,771
Technology Center 1700

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Decided: November 17, 2008

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Before PETER F. KRATZ, ROMULO H. DELMENDO, and LINDA M. GAUDETTE, *Administrative Patent Judges*.

DELMENDO, *Administrative Patent Judge*.

DECISION ON APPEAL

Statement of the Case

Appellants appeal under 35 U.S.C. § 134(a) from a final rejection of all pending claims 1-7. (Appeal Brief filed January 25, 2007, hereinafter "Br."; Final Office Action entered August 22, 2006.) We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

Appellants state that the claimed invention is directed to a blocked biuret group-containing polyisocyanate composition that has a blocked isocyanate functionality of at least 4. (Spec. 2:20-22). Appellants further explain that the composition is prepared by reacting a specified polyisocyanate adduct with a biuretizing agent to incorporate biuret groups into the polyisocyanate, where the polyisocyanate adduct is prepared from a specified aliphatic and/or cycloaliphatic diisocyanate, has an average functionality of at least 2.5, and contains isocyanurate groups and then reacting the biuret-containing polyisocyanate with a blocking agent selected from the group consisting of di-$C_1$-$C_{12}$-alkyl and/or alkoxyalkyl malonates and acetoacetic acid $C_1$-$C_{12}$-alkyl and/or alkoxyalkyl esters. (*Id*. 2:23 -3:4).

Representative claim 1 reads as follows:

> Claim 1: A blocked biuret group-containing polyisocyanate composition having a blocked isocyanate functionality of at least 4 prepared by a process comprising
>
> A) reacting a polyisocyanate adduct which
>
> a) is prepared from an aliphatic and/or cycloaliphatic diisocyanate
>
> b) has an isocyanate functionality of at least 2.5 and
>
> c) which contains isocyanurate groups,
>
> with a biuretizing agent to incorporate biuret groups into said polyisocyanate, and
>
> B) reacting the biuret-containing polyisocyanate with a blocking agent selected from the group consisting of di-$C_1$-$C_{12}$-alkyl and/or alkoxyalkyl malonates and acetoacetic acid $C_1$-$C_{12}$-alkyl and/or alkoxyalkyl esters.

The prior art references relied upon by the Examiner to reject the claims on appeal are:

Adams US 2003/0109664 A1 Jun. 12, 2003

Saunders et al., *Polyurethanes, Part I*, 120 (1962).[1]

The Examiner rejected claims 1-7 under 35 U.S.C. § 103(a) as unpatentable in view of the combined teachings of Adams and Saunders.

Issue

The Examiner found that Adams discloses every limitation of the claims except that Adams discloses the use of alcohol, oxime, and ketimine blocking agents instead of the claimed blocking agents selected from the group consisting of di-$C_1$-$C_{12}$-alkyl and/or alkoxyalkyl malonates and acetoacetic acid $C_1$-$C_{12}$-alkyl and/or alkoxyalkyl esters . (Ans. 3:10-13). The Examiner, however, relied on Saunders, which teaches the specified compounds as blocking agents for polyisocyanates, and concluded: "It would have been obvious to one of ordinary skill in the art at the time of the invention to choose diethyl malonate or ethyl acetoacetate to block the polyisocyanate of Adams et al because Saunders et al show that they deblock at lower temperatures than alcohols or oximes." (*Id*. 3:15-18).

Appellants contend: "[T]he Examiner appears to be equating the chemistry of ketimine blocking agents with those of malonates and acetoacetates as both lists include alcohols and oximes, which are not instantly claimed." (Br. 4:25-27). Furthermore, Appellants assert: "[T]he

[1] Appellants refer to this reference as: J. H. Saunders and K. C. Frisch, *Polyurethanes Chemistry and Technology Part I. Chemistry*, 1962. (Br. 3).

references of record contain no such statement of equivalency or any other statement that would teach, suggest or motivate one of ordinary skill in the art to make such a leap." (*Id*. 4:31-33).

Thus, the issue before us is: Have Appellants shown that the Examiner erred in determining that one of ordinary skill in the art would have found it obvious to substitute Adams's alcohol, oxime, or ketimine blocking agents with Saunders's blocking agents to make Adam's blocked biuret group-containing polyisocyanate composition, thus arriving at the claimed composition?

## Findings of Fact

1. Adams discloses:

> A process for preparing a biuret group-containing polyisocyanate having a functionality of at least 4 which comprises reacting a polyisocyanate adduct which
>
> a) is prepared from an aliphatic, cycloaliphatic, or aromatic diisocyanate;
>
> b) has an average isocyanate functionality of at least 2.8; and
>
> c) contains either isocyanurate or iminooxadiazine dione groups, provided that a total of at least 50 mole percent, based on the total moles of isocyanate adduct groups present in the polyisocyanate adduct, of isocyanurate and iminooxadiazine dione groups are present,
>
> with 0.01 to 0.15 moles of water for each equivalent of isocyanate groups in the polyisocyanate adducts at a temperature of 50 to 180° C[] to incorporate biuret groups into the polyisocyanate adduct. (Claim 1).

2. Adams further states:

> [T]he [inventive] products may be used as is or *may be blocked with any of the conventional blocking agents*.

> Such products are also a part of this invention. Typical blocking agents are alcohols, ketimines, oximes and the like. (¶ 0040; emphasis added).

3. Appellants acknowledge Adams as follows:

> U.S. Patent Publication 2003/0109664 [Adams] describes the production of a higher functional polyisocyanate by biuretizing an isocyanaurate [sic]-group containing polyisocyanate. Among the starting isocyanates described is a trimer of hexamethylene diisocyanate. (Spec. 1:19-23).

4. Saunders lists ethyl malonate, ethyl acetoacetate, alcohol, and oximes as active hydrogen compounds in splitter testing of adducts of hexamethylene diisocyanate. (Saunders at 120).

5. The Examiner found that Saunders suggests that ethyl malonate, ethyl acetoacetate, alcohol, and oximes are blocking agents for isocyanates and that ethyl malonate and ethyl acetoacetate deblock at lower temperatures than alcohols or oximes. (Ans. 3:14-15).

6. Appellants do not specifically dispute the Examiner's finding as to Saunders.

## Principles of Law

"Section 103 forbids issuance of a patent when 'the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.'" *KSR Int'l Co. v. Teleflex Inc*., 127 S. Ct. 1727, 1734 (2007).

> Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at

> issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or nonobviousness of the subject matter is determined.

*KSR Int'l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 1734 (2007) (quoting *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17 (1966)).

"[W]hen a patent claims a structure already known in the prior art that is altered by the mere substitution of one element for another known in the field, the combination must do more than yield a predictable result." *KSR*, 127 S.Ct. at 1740.

"When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. *KSR*, 127 S.Ct. at 1742.

## Analysis

*Rejection of Claims 1-7 in View of Adams and Saunders*

Appellants group claims 1-7 together, submitting specific arguments directed to claim 1, and do not argue the separate patentability of claims 2-7. (App. Br. 3-5). Accordingly, we select claim 1 as representative and confine our discussion to this claim. 37 C.F.R. § 41.37(c)(1)(vii).

Appellants principal argument in this appeal is that the Examiner did not provide a showing of an equivalency between the chemistry of Adams's ketimine blocking agents and that of malonates and acetoacetates as described in Saunders and that, in the absence of such a showing, the Examiner has not met the burden of making out a prima facie case of obviousness. (*Id.* 4:31-5:6).

Appellants' argument is not persuasive. Here, the dispositive question is whether one of ordinary skill in the art, confronted with choosing blocking agents in a known process for making a biuret group-containing polyisocyanate composition, would have found it obvious to select blocking agents from those disclosed by Saunders.

As instructed by *KSR*, "when a patent claims a structure already known in the prior art that is altered by the mere substitution of one element for another known in the field, the combination must do more than yield a predictable result." *KSR*, 127 S.Ct. at 1740.

Applying this principle, the Examiner found that Adams teaches blocked biuret group-containing polyisocyanate compositions prepared by using alcohols, ketimines, or oximes as blocking agents. (FF 1 and 2; Ans. 3:10-13). Adams, however, teaches that alcohols, ketimines, or oximes are merely typical blocking agents and that any conventional blocking agent may be used (FF2). The Examiner found, and Appellants do not dispute, that Saunders teaches diethyl malonate and ethyl acetoacetate as known blocking agents for polyisocyanates. (Ans. 3:14-15; FF 4-6).

From these facts, the Examiner determined that one of ordinary skill in the art would have reasonably expected that the chemical compounds disclosed in Adams and Saunders are interchangeable as blocking agents for polyisocyanates. (Ans. 3:15-17). Furthermore, the Examiner reasoned that the skilled artisan would have been led to use Saunders's blocking agents in place of Adams's blocking agents in order to operate at lower deblocking temperatures. (*Id*. 3:15-18).

We are in complete agreement with the Examiner. It is undisputed that diethyl malonate and ethyl acetoacetate are known blocking agents for

isocyanates (FF 4-6). It is also undisputed that diethyl malonate and ethyl acetoacetate exhibit lower deblocking temperatures than alcohols or oximes. Hence, one of ordinary skill in the art would have reasonably expected that diethyl malonate and ethyl acetoacetate would predictably effect their known blocking functions in the preparation of Adams's blocked polyisocyanates while providing deblocking at lower temperatures than alcohols or oximes. The reason to combine the references is particularly strong in this case because Adams explicitly states that alcohols, ketimines, and oximes are merely typical blocking agents and that any conventional blocking agent may be used.

Appellants do not direct us to any persuasive evidence, such as unexpected results for the claimed invention, to show that the Examiner erred in determining the claimed subject matter obvious. (Br. 3-5). For these reasons, we uphold the Examiner's rejection.

## Conclusion of Law

Appellants have not shown that the Examiner erred in determining that one of ordinary skill in the art would have found it obvious to substitute Adams's alcohol, oxime, or ketimine blocking agents with Saunders's blocking agents to make Adam's blocked biuret group-containing polyisocyanate composition.

## Order

The decision of the Examiner rejecting claims 1-7 is affirmed.

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).

AFFIRMED

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