

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 27

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte TSOUNG Y. YAN

Appeal No. 94-2855
Application 07/887,404¹

ON BRIEF

Before KIMLIN, JOHN D. SMITH and GARRIS, Administrative Patent Judges.

KIMLIN, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 14-45, all the claims remaining in the present application. Claim 14 is illustrative:

¹ Application for patent filed May 19, 1992. According to appellant, this application is a continuation of Application 07/628,311, filed December 17, 1990, now abandoned.

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14. A method for increasing the AACI of an aqueous diethanolamine solution which has been at least partially deactivated from contact with an acid gas, said method comprising contacting said aqueous diethanolamine solution with hydrogen in the presence of a hydrotreating catalyst under conversion conditions of temperature from 30EC to 400EC, liquid hourly space velocity from 0.01 hr⁻¹ to 100 hr⁻¹, pressure from 1 to 14,000 kPa, hydrogen dosage from 1 to 100 mols H₂ per mol of diethanolamine, and contact time sufficient to convert diethanolamine degradation products to diethanolamine.

The examiner relies upon the following references as evidence of obviousness:

Sze et al. (Sze)	3,429,804	Feb. 25, 1969
Kniel	3,696,162	Oct. 3, 1972
Oleck et al. (Oleck)	4,440,630	Apr. 3, 1984
Yan	4,795,565	Jan. 3, 1989
Rubin et al. (Rubin)	4,954,325	Sept. 4, 1990

Appellant's claimed invention is directed to increasing the AACI (acid absorption capacity index), or regenerating, an aqueous diethanolamine solution which has been deactivated by contact with an acid gas which contains H₂S and CO₂. The method involves contacting the deactivated solution with hydrogen in the presence of a hydrotreating catalyst. The result of such contacting is the conversion of degradation products of diethanolamine into diethanolamine. Page 6 of appellant's specification lists several known degradation products of diethanolamine which result from the reaction of diethanolamine and acid gas comprising H₂S and CO₂.

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Appealed claims 27 and 45 stand rejected under 35 U.S.C. § 112, fourth paragraph. Claim 27 stands rejected under 35 U.S.C. § 112, first paragraph, as being based upon an original specification that does not provide descriptive support for the claimed subject matter. Claim 35 stands rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. In addition, the appealed claims stand rejected under 35 U.S.C. § 103 as follows:

(1) Claims 14, 17-19, 26, 27, 30-34, 37-39 and 45 over Kniel in view of Sze;

(2) Claims 15, 16, 28, 29, 35 and 36 over Kniel in view of Sze and Yan;

(3) Claims 20, 21 and 40 over Kniel in view of Sze and Oleck;

(4) Claims 22-25 and 41-44 over Kniel in view of Sze, Oleck and Rubin.

Upon careful consideration of the opposing arguments presented on appeal, we concur with appellant that the prior art applied by the examiner fails to establish a prima facie case of obviousness for the claimed subject matter.

Kniel, the primary reference in all of the examiner's rejections, discloses a process of removing acid gases from a gaseous stream by contacting the stream with an aqueous alkanolamine solution of the kind used by appellant. The aqueous

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amine solution of Kniel is regenerated in unit 23 by withdrawing acid gas through overhead line 24. Kniel does not disclose regenerating degradation products of the alkanolamine in any way, let alone by means of the hydrogenation step claimed by appellant. However, the key to the examiner's rejection is Kniel's disclosure that a hydrocarbon solvent is mixed with the alkanol amine solution to remove troublesome dienes which tend to polymerize and foul the system. Since Sze discloses separating dienes from a gaseous stream also containing aromatic hydrocarbons by treating the stream with hydrogen and a hydrogenation catalyst, the examiner reasons that it would have been obvious for one of ordinary skill in the art to treat the diene-containing stream of Kniel with Sze's hydrogenation step to separate the dienes therefrom, and thereby inherently effect appellant's conversion of alkanolamine degradation products to alkanol amines.

The flaw in the examiner's reasoning is two-fold. First, since Kniel removes dienes from the spent alkanolamine solution by addition of a hydrocarbon solvent, and Sze discloses hydrogenation for separating dienes and the like from aromatic compounds, there would have been no motivation for one of ordinary skill in the art to modify the Kniel process by replacing the treatment with hydrocarbon solvent with Sze's

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hydrotreatment. Secondly, there is no teaching or suggestion in the prior art that hydrotreating a mixture of an aqueous alkanolamine solution and hydrocarbon solvent comprising dienes would result in the conversion of degradation products of alkanolamines. For instance, the reaction kinetics may strongly favor the hydrogenation of dienes over the conversion of alkanolamine degradation products, and the examiner has not established otherwise. It is well settled that a determination of inherency cannot be established by probabilities or possibilities, but only by inevitability. In re Oelrich, 666 F.2d 578, 581, 212 USPQ 323, 326 (CCPA 1981); In re Wilding, 535 F.2d 631, 635-36, 190 USPQ 59, 63-64 (CCPA 1976). Since the other secondary references applied by the examiner do not remedy the deficiency of the combination of Kniel and Sze, we will not sustain the examiner's rejections under 35 U.S.C. § 103.

It is stated on page 1 of the Reply Brief that "[a]pplicant will not contest the rejection of claims 27, 35, and 45 under 35 U.S.C. 112." Accordingly, perforce, we will sustain the examiner's § 112 rejections of claims 27, 35 and 45.

In conclusion, based on the foregoing, the examiner's rejection of claims 27, 35 and 45 under 35 U.S.C. § 112 is affirmed. The examiner's rejections of the appealed claims under

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35 U.S.C. § 103 are reversed. The examiner's decision is affirmed-in-part.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED-IN-PART

EDWARD C. KIMLIN)	
Administrative Patent Judge)	
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BRADLEY R. GARRIS)	BOARD OF PATENT
Administrative Patent Judge)	APPEALS AND
)	INTERFERENCES
)	
)	
JOHN D. SMITH)	
Administrative Patent Judge)	

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