

The opinion in support of the decision being entered today was **not** written for publication and is **not** precedent of the Board.

Paper No. 27

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte AMINUL I. CHOWDHURY, ERIC L. TOLLEFSON
and TUSHAR K. GHOSH

Appeal No. 2000-1016
Application No. 08/487,629

ON BRIEF

Before WALTZ, DELMENDO, and PAWLIKOWSKI, **Administrative Patent Judges**.

PAWLIKOWSKI, **Administrative Patent Judge**.

DECISION ON APPEAL

This is a decision on an appeal from the final rejection of claims 14, 17, 20, and 22-33. Claims 1-13, 15, 16, 18, 19, 21 and 34-38 have been cancelled.

The subject matter on appeal is represented by claim 14, set forth below:

14. A process for the oxidation and elimination of H₂S from gas mixtures comprising adding oxygen to the said mixture to obtain an O₂/H₂S molar ratio in the mixture between 0.5:1 to 0.6:1, passing the said gas mixture into at least one activated carbon bed contained in a reaction vessel and subjecting the said H₂S to the catalytic action of the activated carbon under reaction conditions which produce elemental sulfur with minimal production of SO₂ so that the elemental sulfur produced by the reaction is sorbed by the catalyst while the purified gas is recovered as product, said reaction conditions being selected from a temperature range of between about 130°C to about 220°C and a gas pressure range of between about 500 kPa to 7000 Kpa the activated carbon being subjected to periodic regenerations so that the sorbed sulfur is removed therefrom as another product.

The references relied upon by the examiner as evidence of unpatentability are:

Li	4,196,183	Apr. 1, 1980
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Kohl et al. (Kohl) "Gas Purification" 4th edition published by Gulf Publishing Co. in Houston Texas, U.S.A., 1985, pages 442-449.

Claims 14, 17, 20, and 22-33 stand rejected under 35 U.S.C. § 103 as being unpatentable over Li in view of Kohl.

As a preliminary matter, we note that on page 3 of the answer, the examiner has objected to claim 14 because the slash in line 2 of claim 14 should not be subscripted. On page 4 of the brief, appellants indicate that this minor typographical error would be corrected when the application is referred back to the examiner for consideration. The examiner also indicates on page 3 of the answer that the oath remains objected to because appellants have not given a post office address.

We note that any reference in this decision to appellants' brief concerns Paper No. 23 (not the brief of paper no. 21 which was indicated as a defective brief).

On page 4 of the brief, appellants indicate that the claims stand or fall with independent claim 14. Hence we consider only claim 14 on this appeal. 37 CFR § 1.192(c) (7) (1999).

OPINION

For the reasons set forth in the answer, and below, we will sustain the above-noted rejection.

Appellants argue that the claimed molar ratio, combined with the claimed reaction temperature, combined with the claimed gas pressure, provides for excellent conversion of hydrogen sulfide, with minimal production of SO₂. (brief, page 4-5). Appellants argue that Li requires a stoichiometric ratio of about 1.3 to 1.6. (brief, page 6).

The examiner's position is that it would have been obvious to one of ordinary skill in the art to have utilized from 0.5 to 0.6 moles of oxygen per mole hydrogen sulfide because Li teaches the expected advantage of minimizing corrosion of equipment. (answer, pages 5-6). The examiner further refers to claim 1 of Li where Li recites adding "at least a stoichiometric amount of O₂". (answer, page 10).

On page 2 of the reply brief, appellants argue that Li does not identify the amount of oxygen to be less than 1.3 times the stoichiometric amount, and thus, the fact that Li's claim 1 is broader than the patent's disclosure, does not provide a teaching of appellants' invention as defined in claim 14.

Assuming, *arguendo*, that we agree with appellants' comments regarding Li's claim 1, appellants have not overcome the fact that Li teaches a molar ratio of oxygen to hydrogen sulfide of 0.65:1. See column 2, lines 22-34 of Li ("at least 1.3 times the stoichiometric amount of oxygen to elemental sulfur"). This ratio makes for an oxygen to hydrogen sulfide molar ratio of at least 0.65:1 (as stated by the examiner at the bottom of page 4 of the answer, and as not disputed by appellants on page 5 of the brief). When we compare this ratio with a molar ratio of 0.6:1 (the upper limit of appellants' claimed range of 0.5 to 1 and 0.6 to 1), we determine that a prima facie case has been met. Titanium Metals Corp. v. Banner, 778 F.2d 775, 783, 227 USPQ 773, 779 (Fed. Cir. 1985). Also, where general conditions of the appealed claims are disclosed in the prior art, it is not inventive to discover optimum or workable ranges by routine experimentation, and appellants have the burden of proving any criticality. In re Boesch, 617 F.2d 272, 276, 205 USPQ 215, 218-19 (CCPA 1980); In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). Furthermore, we have determined that appellants have not shown any criticality with regard to their claimed molar ratio range for the following reasons.

Appellants discuss figures 2 and 4 on pages 5-6 of their brief. Appellants state that these figures show their achievement of percent conversion of hydrogen sulfide, while achieving less production of SO₂. On page 3 of the reply brief, appellants point out that Table II of Li does not achieve minimal production of SO₂ while achieving desirable conversion of H₂S.

However, we determine that the data discussed by appellants is not a presentation of a side-by-side comparison of **(1)** results using an O₂/H₂S molar ratio of 0.6 to 1 versus **(2)** results using an O₂/H₂S molar ratio of 0.65 to 1, all other factors remaining the same. Such a comparison would be desirable to prove any criticality. In this context, we remind appellants that rebuttal evidence can be in the form of direct or indirect comparative testing between the claimed invention and the closest prior art. In re Merchant, 575 F.2d 865, 869, 197 USPQ 785, 788 (CCPA 1978); In re Blondel, 499 F.2d 1311, 1317, 182 USPQ 294, 298 (CCPA 1974); In re Swentzel, 42 CCPA 757, 763, 219 F.2d 216, 220, 104 USPQ 343, 346 (1955). Appellants' data is not such a comparison. Furthermore, Li does suggest that the molar ratio is a result effective variable that one skilled in art can optimize. See column 2, lines 53-64 of Li.

In view of the above, we determine the examiner has set forth a prima facie case, and appellants have not successfully rebutted the prima facie case. We note that Kohl did not need to be discussed to address the aforementioned issues on appeal.

In view of the above, the rejection of record is affirmed.

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

AFFIRMED

THOMAS A. WALTZ)
Administrative Patent Judge)
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) BOARD OF PATENT
) APPEALS AND
ROMULO H. DELMENDO) INTERFERENCES
Administrative Patent Judge)
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BEVERLY A. PAWLIKOWSKI)
Administrative Patent Judge)

SLD

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Application No. 08/487,629

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