

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 17

UNITED STATES PATENT AND TRADEMARK OFFICE

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

Ex parte VIDYANATHA A. PRASAD and
PETER E. NEWALLIS

Appeal No. 2001-0849
Application No. 08/990,120

ON BRIEF

Before WINTERS, WILLIAM F. SMITH, and LORIN, Administrative Patent Judges.

LORIN, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 from the final rejection of claims 1-3, 5-12 and 14-25, all the claims pending in the application.¹

¹ Pursuant to 35 U.S.C. § 6(b), we review the adverse decision of the examiner. In doing so, we have considered the record, including:

- Final Rejection (paper no. 13);
- Brief (paper no. 15); and,
- Examiner's Answer (paper no. 16).

Claims 1 and 10 are illustrative of the claims on appeal and reads as follows:

1. A process for making a sulfoxide comprising oxidizing a sulfide in a reaction mixture containing a perborate as an oxidizing agent to form a reaction product that contains the sulfoxide, wherein the oxidation occurs at a pH of from about 0.5 to about 5.0.
10. A process for making a sulfoxide comprising oxidizing a sulfide in a reaction mixture containing a percarbonate as an oxidizing agent to form a reaction product that contains the sulfoxide, wherein the oxidation occurs at a pH of from about 0.5 to about 5.0.

The references relied upon by the examiner are:

Shanklin et al. (Shanklin) 4,724,235 Feb. 9, 1988

Hackh's Chemical Dictionary (Hackh's), 4th Ed., New York, McGraw-Hill Book Company, p. 498 (1969)

Durst, "Sulphoxides", Comprehensive Organic Chemistry, Chp. 11.6, Vol. 3: Sulphur, Selenium, Silicon, Boron, Organometallic Compounds, pp. 121-156, (1979).

Claims 1-3, 5-12 and 14-25 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Durst and Shanklin in view of Hackh's.

DISCUSSION

The issue for our review is whether the claimed invention is properly rejectable under § 103 as being unpatentable over Durst and Shanklin in view of Hackh's. After careful review of the record, we find the examiner's position raised in this appeal is not amenable to a meaningful review. Under the present circumstances, the position put forward by the examiner in support of the rejection is insufficient for the reasons infra. Since the Board serves as a board of review, not a

de novo examination tribunal (35 U.S.C. § 6(b)), it is necessary that we understand examiner's position and that that position be thoroughly presented before we make that review. Accordingly, we vacate the rejection and remand the application to the examiner so that the rejection can be reconsidered in light of our discussion and, if reinstated, supported with proper grounds.

The claimed invention is directed to a process for making a sulfoxide comprising

- oxidizing a sulfide in a reaction mixture containing a perborate as an oxidizing agent;
- wherein the oxidation occurs at a pH of from about 0.5 to about 5.0.

It is axiomatic that:

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.

Graham v. John Deere, 383 U.S. 1, 17-18, 148 USPQ 459, 467 (1966).

Regarding the scope and content of the prior art, examiner (Examiner's Answer, pp. 4-5) states that Durst teaches "the preparation of sulfoxides by oxidation of sulfides"; Shanklin teaches "the process of making a sulfoxide of a compound having the general formula I comprising the oxidation of the corresponding sulfide with perborate"; and, Hackh's teaches "percarbonate ... as oxidizing agent."

Regarding the differences between the prior art and the claims at issue, examiner (Examiner's Answer, p. 5, first paragraph) addresses various limitations

in the claims and pronounces these limitations as either taught in one of the cited references

The difference between the instant invention and [Durst] is that applicants use perborate or percarbonate as the oxidizing reagent. However, [Hackh's] teaches percarbonate (decomposes to hydrogen peroxide in aqueous solution) as oxidizing agent.

or of no patentable significance.

The temperature range of -70 to 80°C by [Durst] embrace a temperature range of 60 to 90°C because, there is no significant difference between the upper limits of 80°C and 90°C . A pH of about 0.5 to 5.0 or 0.5 to 0.1 is not in and of itself patentable over the prior arts.

In conclusion, examiner (Examiner's Answer, p. 5) states that the "invention is prima facie obvious from the teachings of [Durst], [Shanklin], and [Hackh's] because it would have been suggested to one of ordinary skill in the art. The motivation is to produce a sulfoxide compound by oxidation of the corresponding sulfide compound."

The initial burden rests with the examiner to establish a prima facie case of obviousness of the claimed invention over the prior art. See In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). Here, examiner follows the steps of applying the standard for determining obviousness but the underlying analysis lacks the necessary substance for a meaningful review to determine if examiner has met that initial burden. Examiner's position is inadequate for two reasons.

First, examiner appears to have taken a shotgun approach to the claims. In doing so, all the claims are treated alike without consideration of the differences

between the claims. As a result, not all the differences between the claimed invention and prior art have been identified and addressed. "All words in a claim must be considered in judging the patentability of that claim against the prior art." In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

For example, examiner makes the point that the "temperature range of -70 to 80°C by [Durst] embrace a temperature range of 60 to 90°C ". This applies to only two of the claims. The rest of the claims either have no temperature range at all, which raises the question of why Durst was applied to those claims, or provide for an even more narrow range of temperatures, which has been completely ignored.

In another example, even though the pH limitation of 0.5 to 5.0 or 0.5 to 0.1 , which appears in all the claims, has been addressed (but inadequately as we discuss infra), examiner addresses it in relation to a suggestion made in Shanklin to use a weak acid. However, the suggestion made in Shanklin to use a weak acid is in the context of a reaction involving a perborate oxidizing agent. However, not all the claims are directed to using a perborate oxidizing agent. The claims directed to using percarbonate are not addressed. Examiner never explains how one of ordinary skill would derive a reaction using a percarbonate oxidizing agent conducted at a pH of 0.5 to 5.0 or 0.5 to 0.1 from the Shanklin disclosure involving a perborate.

Also, there are numerous limitations in the dependent claims, which have simply not been touched upon. Claim 7, for instance, requires the pH to be maintained by adding hydrochloric acid to the reaction mixture of sulfide and

perborate oxidizing agent. Where is this disclosed in the cited prior art? In another instance, claim 19 calls for using, as the sulfide starting material, 2-(methylthio)-5-(trifluoromethyl)-1,3,4-thiadiazole. Where is this disclosed? Examiner must analyze each claim separately and address each and every limitation in the claims in making the determination of obviousness of the claimed invention as a whole. Until examiner does so, we are not placed in a position to make an amenable review.

Second, where differences between the claims and the prior art have been addressed, namely as to temperature and pH, an insufficient rationale is given to support the obviousness for modifying the prior art method in order to derive the claimed invention.

Regarding the temperature range of 60 to 90⁰C, examiner states that “[t]he temperature range of –70 to 80⁰C by [Durst] embrace a temperature range of 60 to 90⁰C because, there is no significant difference between the upper limits of 80⁰C and 90⁰C.” We do not understand this reasoning. Notwithstanding that examiner never explains why the difference is insignificant, ten degrees would appear to be a significant overlap in ranges. The issue is whether it would have been obvious to conduct the claimed invention at the claimed temperatures in view of the prior art. Accordingly, examiner must explain how Durst’s disclosure of using a temperature within the range of –70 to 80⁰C would have suggested to one of ordinary skill to conduct the claimed invention at a temperature within the claimed range. Examiner does not provide an explanation and it is not satisfied by simply concluding that

differences in claimed and disclosed temperature ranges are “insignificant”. Until an explanation is given that properly addresses the claimed temperature range, we are not in a position to review the appropriateness of the rejection.

Regarding the pH limitation, examiner makes two statements. (1) “A pH of about 0.5 to 5.0 or 0.5 to 1.0 is not in and of itself patentable over the prior arts.” (2) “[T]he process of [Shanklin] (column 6, reaction Iva-2) was performed in dilute acid solution and as such, the pH of the reaction solution must be within the range of 0.5 to 5.0.”

It is not clear to us what examiner is trying to say. If examiner’s position is that it would have been obvious over the prior art to conduct the method at the claimed pH because Shanklin discloses conducting a relevant process using a “dilute acid,” then examiner should so state, preceded by a thorough analysis of Shanklin’s disclosure and comparison with the claims. Reaction Iva-2, to which examiner refers, involves oxidizing a unique sulfide with sodium perborate in “dilute acid” to obtain a corresponding sulfoxide. The pH, the precise acid used and the level of dilution are unknown. Therefore, contrary to what examiner suggests, Shanklin’s “dilute acid” does not inherently have a pH between 0.5 to 5.0; the term “dilute acid” suggests a broader range of possible pHs than what is claimed, covering pHs from just above 0.0 to just below 7.0. The issue is whether it would have been obvious to conduct the claimed invention at a pH within the more limited claimed ranges of 0.5 to 5.0 and 0.5 to 1.0, in view of Shanklin. Accordingly, examiner must explain how Shanklin’s disclosure of using a “dilute acid” would have

suggested to one of ordinary skill to conduct the claimed invention at a pH within the claimed ranges. Examiner never provides an explanation and it is not satisfied by making statements that the claimed pH limitation is “not in and of itself patentable” or inherently covered by the term “dilute acid.” Until such an explanation is given, we are not in a position to review the appropriateness of the rejection.

Accordingly, examiner needs to clarify the grounds for establishing a prima facie case of obviousness for combining the prior art disclosures.

Finally, another difficulty arises as a result of the examiner never fully addressing the experimental data set forth in appellants' Declaration of November 16, 1999 (paper no. 12). According to appellants' Brief (bottom p. 4), the “Declaration previously filed by Appellants on November 12, 1999, demonstrates the criticality of pH on the net yield of the TDA sulfoxide.” Appellants go on to discuss the results set forth on the Declaration. We do not know examiner's position regarding the data. This is all that we could find on the subject (Examiner's Answer, p. 5):

Applicant's amendment filed 3/1/99 and the arguments together with a declaration filed 11/2/99 have been fully considered but they are not persuasive. Applicants amended claims 1, 5-6, 10 and 14-15, wherein the pH of the claimed oxidation process is limited to 'about 0.5 to about 5.0'. In the argument filed 11/2/99 applicants refer to the accompanying declaration for support that the pH range of about 0.5 to 5.0 is very critical to the instantly claimed process (as the pH increases from 5.5 to 0.5, percent yield decreases). ... Applicants also contend that [Shanklin] do not suggest the criticality of controlling the pH of the reaction. This is not persuasive because the process of [Shanklin] (column 6, reaction Iva-2) was performed in dilute acid solution and as such, the pH of the reaction solution must be within the range of 0.5 to 5.0.

Nowhere in this passage is the Declaration data addressed. Examiner seems to have concluded that because Shanklin discloses a “dilute acid”, the Declaration data cannot be persuasive of nonobviousness. Since we are not dealing with a rejection under 35 U.S.C. §102 but one under 35 U.S.C. §103, it is improper to dismiss the Declaration as examiner appears to have done. As the court stated in Connell v. Sears, Roebuck & Co., 722 F.2d 1542, 1549, 220 USPQ 193, 199 (Fed. Cir. 1983):

It is inappropriate and injudicious to disregard any admissible evidence in any judicial proceeding. Hence all relevant evidence on the obviousness issue must be considered before a conclusion is reached. Stratoflex, Inc. v. Aeroquip Corp., 713 F.2d 1530, 218 USPQ 871 (Fed. Cir. 1983).

Evidence under 37 CFR § 1.132 must be considered and, as mandated by the court in In re Piasecki, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984) and In re Rinehart, 531 F.2d 1048, 1052, 189 USPQ 143, 147 (CCPA 1976), the prima facie case must be considered anew in view of this evidence.

Therefore, after clarifying the prima facie case, the examiner should reweigh the entire merits of the prima facie case in light of the data disclosed in appellants’ specification. See In re Hedges, 783 F.2d 1038, 1039, 228 USPQ 685, 686 (Fed. Cir. 1986).

RECOMMENDATIONS

Upon return of the application, the examiner should step back and reassess the patentability of the pending claims in view of the comments made herein.

Examiner should reformulate the rejection and provide a clear and consistent

analysis that explains how the prior art disclosures would lead one of ordinary skill to modify the prior art process to thereby derive the claimed process. In doing so, examiner should address every limitation in the claims and establish differences between the claimed composition and the prior art and, if differences exist, explain why the prior art provides substantial evidence supporting a prima facie case of obviousness of the claimed composition. With respect to the issue of pH and temperature ranges, examiner should consult MPEP 2131.03 (“Anticipation of Ranges”) and 2144.05 (“Obviousness of Ranges”). In making the necessary analysis, examiner should be mindful that the mere fact that the prior art could be modified to obtain the claimed process does not make the modification obvious unless the prior art suggested the desirability of the modification. In re Gordon, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984). “To establish a prima facie case of obviousness based on a combination of references, there must be a teaching, suggestion or motivation in the prior art to make the specific combination that was made by the applicant.” In re Dance, 160 F.3d 1339, 1343, 48 USPQ2d 1635, 1637 (Fed. Cir. 1998). It does not suffice to say that “[t]he motivation is to produce a sulfoxide compound by oxidation of the corresponding sulfide compound” as examiner has. Something in the prior art as a whole must suggest the desirability of making a sulfoxide by, per the broadest claim (claim 1), oxidizing a sulfide at a pH of from 0.5 to 5.0 and thus the obviousness of making that combination. Lindemann Maschinenfabrik GmbH v. American Hoist and Derrick Co., 730 F.2d 1452, 1462, 221 USPQ 481, 488 (Fed. Cir. 1984). Furthermore,

there must also be a reasonable expectation that using an oxidizing agent, such as perborate or percarbonate, at, for instance, a pH within the range of from 0.5 to 5.0, at the prescribed temperature, would transform the starting sulfide into a sulfoxide. “Both the suggestion and the reasonable expectation of success must be founded in the prior art, not in the applicant’s disclosure.” In re Vaeck, 947 F.2d 488, 493, 20 USPQ2d 1438, 1442 (Fed. Cir. 1991). “Obviousness can not be established by hindsight combination to produce the claimed invention,” In re Dance, 160 F.3d 1339, 1343, 48 USPQ2d 1635, 1637 (Fed. Cir. 1998).

Finally, if reestablished, examiner should analyze and reevaluate the prima facie case in light of data that appellants argue would overcome the prima facie case of obviousness. Examiner should respond to the persuasiveness of appellants’ data in overcoming the prima facie case of obviousness.

For the foregoing reasons, we vacate the rejection under § 103 and remand to give the examiner an opportunity to consider the issues discussed herein and take appropriate action not inconsistent with the views expressed herein. We emphasize that we vacate examiner’s rejections. This means that the instant rejection no longer exists and the issues set forth herein cannot be satisfied by a Supplemental Examiner’s Answer. See Ex parte Zambrano, 58 USPQ2d 1312, 1313 (Bd. Pat. App. & Int. 2000).

VACATED AND REMANDED

SHERMAN D. WINTERS)
Administrative Patent Judge)
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) BOARD OF PATENT
WILLIAM F. SMITH)
Administrative Patent Judge) APPEALS AND
)
) INTERFERENCES
)
HUBERT C. LORIN)
Administrative Patent Judge)

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PATENT DEPARTMENT
BAYER CORPORATION
100 BAYER ROAD
PITTSBURGH, PA 15205-9741

HCL/jlb