

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.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. 58

**UNITED STATES PATENT AND TRADEMARK OFFICE**

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

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Ex parte FRED A. HEITFELD and  
SUSAN A. ANDERSON

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Appeal No. 1999-1276  
Application No. 08/318,574

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ON BRIEF

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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, 3-8, 10-12, 15 and 19-27, all the claims pending in the application.<sup>1</sup>

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<sup>1</sup> 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. 52);  
Brief (paper no. 54);  
Examiner's Answer (paper no. 55);  
Reply To Examiner's Answer (paper no. 56); and,  
Examiner Communication (paper no. 57).

Claim 1 is illustrative of the claims on appeal and reads as follows:

1. A method for quantitating an organic peracid comprising:

introducing into a sample solution containing an organic peracid in the presence of a high background of hydrogen peroxide in said solution, an amount of catalase sufficient to decompose said hydrogen peroxide in said solution;

reacting all of the hydrogen peroxide present in said solution with sufficient amount of said catalase without decomposing said organic peracid present in the solution; and

quantitating said organic peracid in ppm active oxygen (A.O.) by measuring an amount of said organic peracid in an absence of said hydrogen peroxide.

The references relied upon by the examiner are:

Bittner	3,677,903	Jul. 18, 1972
Clements et al. [Clements '210]	4,338,210	Jul. 06, 1982
Clements [Clements '566]	4,427,566	Jan. 24, 1984
Wiersema et al. [Wiersema]	5,296,161	Mar. 22, 1994

Heath et al. (Heath), "A New Sensitive Assay for the Measurement of Hydroperoxides," Analytical Biochemistry, Vol. 76, pp. 184-191 (1976)

Johnson et al. (Johnson), "The Determination of Organic Peroxides," Pergamon Press, pp. 15-27 (1970)

Claims 1, 8, 10-12, 15 and 19-27 stand rejected under 35 U.S.C.

§ 103(a) as being unpatentable over the combination of Johnson in view of each of Heath, Bittner, Clements '210 and Clements '566.

Claims 3-7 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Johnson in view of each of Heath, Bittner, Clements '210 and Clements '566, as applied to claims 1, 8, 10-12, 15 and 19-27, and further in view of Wiersema.

### DISCUSSION

Examiner has the burden of establishing a prima facie case of obviousness. In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992).

Accordingly, examiner has the initial burden of establishing that the claimed invention would have been obvious over at least Johnson in view of Heath, Bittner, Clements '210 and Clements '566. That initial burden has not been met.

The claimed invention is directed to a process for quantitating an organic peracid. The process, as exemplified by claim 1, involves three steps:

1. introducing catalase into a sample solution containing an organic peracid and a high background of hydrogen peroxide;
2. reacting all of the hydrogen peroxide present in the solution with catalase and without decomposing the organic peracid present in the solution; and,
3. quantitating the organic peracid in ppm active oxygen (A.O.) by measuring an amount of the organic peracid in an absence of hydrogen peroxide.

Examiner submits, and appellants do not dispute it, that the primary reference, Johnson, shows a method of quantitating an organic peracid in a solution that contains hydrogen peroxide. Johnson describes (Table 3.1, p. 24, e.g., sixth and seventh entries; references 21 and 18, respectively) conditions for determining peracids including reagents for removing hydrogen peroxide.

Examiner (Examiner's Answer, p. 5) concedes, however, that Johnson does not disclose catalase as the claimed invention requires. Rather than using enzymatic means to remove the hydrogen peroxide, Johnson uses chemical

reagents such as Ce(IV) and  $\text{KMnO}_4$ . For this reason, examiner relies on the secondary art.

According to the examiner, Heath shows a quantitation method in which catalase is used to remove hydrogen peroxide<sup>2</sup> and Bittner, also directed to a quantitation method, discloses that catalase is specific "for hydrogen peroxide and not other peroxides"<sup>3</sup>. Finally, according to the examiner, the two Clements patents show catalase used together with organic peracids to form a washing and bleaching composition.

Examiner concludes:

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to employ catalase to remove the excess hydrogen peroxide present prior to determining peracids because the art suggests that catalase be used to remove hydrogen peroxide in the presence of other organic peroxides and the art is consistent with the stability of peracids in the presence of catalase.

Examiner's Answer, p. 6. Notwithstanding examiner's conclusion, we do not find that examiner has made out a prima facie case of obviousness.

"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

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<sup>2</sup> "Heath et al. (Analytical Biochemistry) entitled "A New Sensitive Assay for the Measurement of Hydroperoxides" on page 185 last paragraph bridging to page 186, specifically suggest the utility of catalase for the removal of hydrogen peroxide in the presence of other peroxides." Examiner's Answer, p 5.

<sup>3</sup> "Bittner (3,677,903) entitled 'Determination of Uricase Activity' teaches in column 4 lines 33-37, teaches [sic] the specificity of catalase for hydrogen peroxide and not other peroxides." Examiner's Answer, pp. 5-6.

F.3d 1339, 1343, 48 USPQ2d 1635, 1637 (Fed. Cir. 1998). 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). Something in the prior art as a whole must suggest the desirability and thus the obviousness of making the combination. Lindemann Maschinenfabrik GmbH v. American Hoist and Derrick Co., 730 F.2d 1452, 1462, 221 USPQ 481, 488 (Fed. Cir. 1984).

Examiner has established that the references disclose various elements of the claimed invention but has not pointed to anything in these references, and we can find none, that suggest the desirability of modifying Johnson's idiometric method of quantitating organic peracids to replace the chemical reagents used therein to remove hydrogen peroxide with the catalase of the secondary prior art.

Johnson is, like the claimed method, directed to a method of quantitating organic peracids, albeit an idiometric method involving chemical reagents and not catalase. Heath and Bittner use catalase to remove hydrogen peroxide but do not quantitate organic peracids; instead, they quantitate hydroperoxides and uricase, respectively. Furthermore, and in contrast to the claimed invention which introduces the catalase to a solution of organic peracids and a high background of hydrogen peroxide, Heath uses the catalase separately from the actual assay to initially incubate the sample to remove hydrogen peroxide (see sentence bridging pp. 185-186) and Bittner uses catalase to remove hydrogen peroxide generated as a by-

product during uricase oxidation (see column 3, lines 15-30). The Clements' patents also disclose using catalase and they disclose using catalase in combination with organic peracids as the claimed method requires. However, the Clements' patents are not directed to quantitation methods but rather to washing and bleaching compositions and, unlike the claimed method, the catalase is used to scavenge any existing excess persalts that might interfere with the composition's bleaching results and not to remove hydrogen peroxide (see e.g., Clements '210, column 2, lines 57-62). Accordingly, the references do disclose various elements of the claimed method.<sup>4</sup> However, there is no suggestion to lead one of ordinary skill in the art to combine these elements in the manner claimed. We fail to find, and Examiner has not shown, anything in the references that would suggest modifying Johnson's idiometric method of quantitating organic peracids in order to replace the chemical reagents used therein for removing hydrogen peroxide with the catalase used by Heath, Bittner and the Clements' patents and thereby derive the claimed invention.

We agree with appellants that "the Examiner ignored the fact that one of ordinary skill in the art can not simply use catalase in decomposing a high background of hydrogen peroxide in a method for quantitating the organic peracid [as claimed] without the motivation or suggestion in the prior art to replace the

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<sup>4</sup> I.e., quantitating organic peracids in which hydrogen peroxide is removed (Johnson); removing hydrogen peroxide with catalase (Heath); removing hydrogen peroxide, in the presence of other peroxides (e.g., organic peracids) with catalase (Bittner); and, using catalase together with organic peracids (the Clements' patents).

chemical means with enzymatic means.” Brief, p. 10<sup>5</sup>. Rather than pointing to something in the prior art that would suggest the desirability of replacing the chemical means in Johnson with catalase, Examiner argues that the two techniques – Johnson’s chemical and Heath and Bittner’s enzymatic techniques – are known equivalents<sup>6</sup>; the argument being that, given knowledge that chemical and enzymatic hydrogen peroxide removal techniques are equivalent, one of ordinary skill would look to either alternative to accomplish the same result. For two reasons, the argument is unpersuasive.

First, there is no evidence to support Examiner’s position that chemical and enzymatic hydrogen peroxide removal techniques are known equivalent alternatives. While the combined disclosures of Johnson, Heath and Bittner would appear to suggest that hydrogen peroxide could be removed by either certain chemical reagents like Ce(IV) and KMnO<sub>4</sub> or catalase, these peroxide removal agents are

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<sup>5</sup> The passage reads in its entirety: “From the above, the Examiner ignored the fact that one of ordinary skill in the art can not simply use catalase in decomposing a high background of hydrogen peroxide in a method for quantitating the organic peracid without the motivation or suggestion in the prior art to replace the chemical means with enzymatic means. Moreover, the use of catalase could substantially affect the organic peracid being assayed. It is well known in the art that catalase is among the fastest enzymes known, i.e., each molecule of catalase can decompose more than 10<sup>7</sup> molecules of H<sub>2</sub>O<sub>2</sub> a second. Furthermore, catalase is a large enzyme having a 244,000 to 250,000 molecular weight, which catalyzes the rapid decomposition of hydrogen peroxide into water and oxygen [see p. 7 of the specification]. However, Appellants were able to use catalase in decomposing hydrogen peroxide without substantially affecting the organic peracid that is being quantitated. Note Tables I-II of the Appellants’ specification.” Brief, p. 10.

<sup>6</sup> “Regarding the equivalency of chemical means with enzymatic means to remove excess hydrogen peroxide, it is well known in the chemical arts to perform the same process by selecting either chemical means or enzymatic means depending upon the desired result. Heath and Bittner teach employing catalase for the removal of hydrogen peroxide in the presence of other peroxides. One would have a high expectation of success in employing known enzymes for their known function to perform an equivalent function performed by other types of reagents.” Examiner’s Answer, p. 10.

used in very different environments. As we have indicated, Johnson uses its chemical reagents in the context of quantitating organic peracids while Heath and Bittner use catalase in the context of quantitating hydroperoxides and uricase, respectively. The circumstances under which the chemical reagents and catalase are used in the references are so different that it is impossible to predict how, or even if, catalase could perform a hydrogen peroxide removing function in the context of Johnson's method of quantitating organic peracids. Accordingly, Examiner's position that chemical and enzymatic hydrogen peroxide removal techniques are known equivalent alternatives is based on speculation.

Second, even if evidence was available to show that these techniques are known equivalent alternatives, simply replacing the chemical reagents in Johnson with the catalase of the secondary references does not establish a prima facie case of obviousness for the claimed method. As appellants have indicated (see footnote 5, supra), the claimed method requires reacting all of the hydrogen peroxide present in the solution and without decomposing the organic peracid present in the solution, features not taught in any of the references. There must be a reasonable expectation of success that, in using catalase in Johnson's method, hydrogen peroxide is eliminated without decomposing the organic peracids. "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).<sup>7</sup> Accordingly, in establishing the prima facie case of obviousness, Examiner has the burden of showing that, in using the catalase of the secondary references in Johnson's quantitation method (assuming arguendo that chemical and enzymatic means of removing hydrogen peroxide are equivalent alternatives), there would have been a reasonable expectation of success in eliminating the hydrogen peroxide without decomposing the organic peracids.

Examiner acknowledges that Heath and Bittner do "not establish that catalase does not degrade peracids" (Examiner's Answer, p. 6). To overcome this, examiner cites the Clements patents which teach using a washing/bleaching composition comprising both organic peracids and catalase. According to the examiner, "if the catalase degraded the reaction product, peracids, then it is difficult to understand why it was employed by Clements and Clements et al"<sup>8</sup>. As we understand it, examiner is arguing that, for the Clements' composition to work, the catalase must not decompose the organic peracid and, if that is so, then inherently catalase does not decompose organic peracids.

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<sup>7</sup> "Where claimed subject matter has been rejected as obvious in view of a combination of prior art references, a proper analysis under § 103 requires, inter alia, consideration of two factors: (1) whether the prior art would have suggested to those of ordinary skill in the art that they should make the claimed composition or device, or carry out the claimed process; and (2) whether the prior art would also have revealed that in so making or carrying out, those of ordinary skill would have a reasonable expectation of success. See In re Dow Chemical Co., 837 F.2d 469, 473, 5 USPQ2d 1529, 1531 (Fed. Cir. 1988). Both the suggestion and the reasonable expectation of success must be founded in the prior art, not in the applicant's disclosure. Id."

<sup>8</sup> "The best evidence available that catalase does not degrade peracids comes from the teachings of Clements et al. (US Patent 4,338,210) and Clements (US Patent 4,427,566). These references teach using catalase to control the hydrogen peroxide driven production of peracids. If the catalase degraded the reaction product, peracids, then it is difficult to understand why it was employed by Clements and Clements et al." Examiner's Answer, p. 6.

The difficulty with the examiner's reasoning is that it presumes that, for the Clements composition to work, that no decomposition of peracids occurs during use. It is not at all clear that catalase would not decompose organic peracids. Moreover, the claimed method is not directed to adding catalase to a solution of organic peracids per se but to a solution of organic peracids with a high background of hydrogen peroxide. The Clements patents do not disclose introducing catalase to such a solution. In fact, the Clements patents disclose using catalase to remove persalts not hydrogen peroxide. The Clements patents have no appreciation of the effect catalase has on organic peracids when the two are in the presence of a high background of hydrogen peroxide.

Accordingly, examiner's premise that catalase does not decompose organic peracids is speculative. As a result, there can be no reasonable expectation of success that employing catalase in a quantitating method involving a solution of organic peracids and a high background of hydrogen peroxide would result in the reaction of all the hydrogen peroxide and without the decomposition of the organic peracids.

The only reason for selecting catalase and in an amount as claimed is provided by appellants' disclosure. On pages 4-6 of the specification, appellants indicate that a need exists for preventing interference with quantitation determinations of peracids in the presence of high concentration of hydrogen peroxide. According to appellants, peracid has a relatively short half-life in the presence of hydrogen peroxide, making quantitation difficult. Appellants describe

finding an effective amount of catalase that will completely decompose hydrogen peroxide without substantially affecting any peracid present in the sample (see specification, p. 12). In this way, appellants can proficiently quantitate organic peracids without interference from a relatively large quantity of hydrogen peroxide.

However, it is impermissible to use the disclosure from appellants' specification as a blueprint to reach the claimed invention from the prior art disclosure. "When prior art references require selective combination by the court to render obvious a subsequent invention, there must be some reason for the combination other than the hindsight gleaned from the invention itself." Uniroyal Inc. v. Rudkin-Wiley Corp., 837 F.2d 1044, 1051, 5 USPQ2d 1434, 1438 (Fed. Cir.), cert. denied, 118 S.Ct. 1548 (1988). Nevertheless, one cannot rely on appellant's disclosure to support a case of obviousness. "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). Since the only reason for employing catalase as claimed is provided by the specification, we conclude that the examiner has not met the burden of establishing a prima facie case of obviousness of the claims over Heath, Bittner, Clements '210 and Clements '566.

The rejection of claims 1, 8, 10-12, 15 and 19-27 under 35 U.S.C. § 103(a) as over the combination of Johnson in view of each of Heath, Bittner, Clements '210 and Clements '566 is reversed.

Accordingly, the rejection of claims 3-7 under 35 U.S.C. § 103(a) as being unpatentable over the combination of Johnson in view of each of Heath, Bittner, Clements '210 and Clements '566, as applied to claims 1, 8, 10-12, 15 and 19-27, and further in view of Wiersema is also reversed.

REVERSED

SHERMAN D. WINTERS  
Administrative Patent Judge  
  
WILLIAM F. SMITH  
Administrative Patent Judge  
  
HUBERT C. LORIN  
Administrative Patent Judge

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