

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.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. 24

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* RAGNAR WOLD

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Appeal No. 1998-2349  
Application 08/586,874

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ON BRIEF

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Before OWENS, WALTZ and TIMM, *Administrative Patent Judges*.

OWENS, *Administrative Patent Judge*.

*DECISION ON APPEAL*

This is an appeal from the examiner's final rejection of claims 8-13, which are all of the claims remaining in the application.

*THE INVENTION*

Appellant's claimed invention is directed toward a method for removing iron and halogens from hydrochloric acid. Claim 8 is illustrative:

Appeal No. 1998-2349  
Application 08/586,874

8. A method for removing iron and halogens from hydrochloric acid containing iron and halogens, which comprises removing iron from the hydrochloric acid and thereafter adding a nitrogen containing reducing agent to the acid.

*THE REFERENCES*

Wilson 1957	2,787,523	Apr. 2,
Takatomi <sup>1</sup> 1990 (Japanese Kokai)	2-233503	Sep. 17,

*THE REJECTIONS*

Claims 8-13 stand rejected under 35 U.S.C. § 103 over Takatomi and over Wilson in view of Takatomi.

Appellant states that the claims stand or fall separately (brief, page 3). However, appellant provides a substantive argument as to the separate patentability of only the sole independent claim (claim 8) and dependent claims 11 and 13. Dependent claims 9, 10 and 12, therefore, stand or fall with claim 8, and we limit our discussion to claims 8, 11 and 13. See *In re Ochiai*, 71 F.3d 1565, 1566 n.2, 37 USPQ2d 1127, 1129 n.2 (Fed. Cir. 1995); 37 CFR § 1.192(c)(7)(1997).

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<sup>1</sup>Citations herein to this reference are to the English translation thereof which is of record.

*Claim 8*

Takatomi discloses a method for removing iron and chlorine from hydrochloric acid containing free chlorine and iron (page 1). The chlorine is first removed by contacting the hydrochloric acid with either a reductant alone or a reductant followed by low-activated carbon, and then the iron is removed by contacting the hydrochloric acid with a strong basic anion exchange resin (pages 1 and 4-5). The reductant preferably is at least one of hydrazine, hydroxylamine chlorate, urea and hydrogen peroxide (pages 1 and 4).

Takatomi removes the free chlorine to prevent the hydrochloric acid from being colored and to prevent the anion exchange resin from partially losing its exchange capacity due to being oxidized by free chlorine (page 2). Takatomi must use low-activated carbon to remove the chlorine, because high-activated carbon would reduce the iron such that it cannot be thoroughly removed by the anion exchange resin (pages 2-3).

Thus, Takatomi would have fairly suggested two approaches to one of ordinary skill in the art. One is Takatomi's approach, which is to carry out the chlorine removal upstream

of the anion exchange resin. This approach has the advantage of preventing loss of anion exchange capacity, but has the disadvantage of requiring the use of low-activated carbon to remove the chlorine. The second approach is to place the anion exchange resin upstream of the chlorine removal. This approach has the advantage of permitting use of high-activated carbon for chlorine removal and avoiding, due to the iron being removed upstream of the high-activated carbon, any reduction of the iron by the high-activated carbon, but has the disadvantage of some loss of anion exchange resin capacity. The fair suggestion, to one of ordinary skill in the art, of this second approach would have rendered the method recited in appellant's claim 8 *prima facie* obvious to such a person.

Appellant argues that one of ordinary skill in the art would not have been motivated to remove the iron in Takatomi's method before the chlorine because such a person would have expected that doing so would have the disadvantage of partial loss of anion exchange resin capacity and would not have any advantage (reply brief, page 2). The advantage, as discussed

Appeal No. 1998-2349  
Application 08/586,874

above, would be prevention of reduction of the iron by high-activated carbon, so that iron could be removed effectively by the anion exchange resin and high-activated carbon could be used to remove the chlorine.

Appellant argues that one of ordinary skill in the art, when carrying out appellant's method, would not use a strong basic anion exchange resin which is known to be susceptible to damage by chlorine but, rather, would use an ion exchange resin which would remove the iron without being damaged by chlorine (brief, pages 5-6; reply brief, page 3). Appellant does not disclose what ion exchange resin is used in his method, but, rather, merely states that the iron is removed, preferably by filtration and ion exchange (specification, page 2). If those of ordinary skill in the art knew, as appellant argues, of resins which effectively remove iron without being damaged by chlorine, then the disclosure of partial loss of exchange capacity by Takatomi would have led them to use such a resin instead of Takatomi's strong basis anion exchange resin. See *In re Nomiya*, 509 F.2d 566, 572, 184 USPQ 607, 613 (CCPA 1975). Appellant's claimed invention,

Appeal No. 1998-2349  
Application 08/586,874

therefore, would have been *prima facie* obvious to one of ordinary skill in the art for this additional reason.

Regarding the rejection over Wilson in view of Takatomi, appellant's claimed invention would have been *prima facie* obvious to one of ordinary skill in the art over Takatomi as discussed above. Wilson provides an additional disclosure of removing chlorine from hydrochloric acid by use of hydroxylamine (col. 1, lines 33-35).

Because appellant has not effectively rebutted the *prima facie* case of obviousness of the method recited in claim 8 over the applied references, we affirm the rejections of that claim.

#### *Claim 11*

Appellant's claim 11 requires that the reducing agent is supplied in excess compared to a stoichiometric quantity.

Takatomi discloses that "[t]he amount of the reductant to be added is a stoichiometric amount or less for the amount of the free chlorine, and the amount of the reductant should not be excessive" (page 4).

Appeal No. 1998-2349  
Application 08/586,874

The amount of excess in appellant's claim 11 can exceed the stoichiometric quantity by an amount as small as an infinitesimal amount. In our view, the disclosure that the amount can be stoichiometric or less additionally would have fairly suggested, to one of ordinary skill in the art, use of an amount which exceeds the stoichiometric amount by only an infinitesimal degree. The reason is that one of ordinary skill in the art would have reasonably expected the performance of the reducing agent, whether added in the stoichiometric amount or an amount which differs from it by only an infinitesimal degree, to be essentially the same. See *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 783, 227 USPQ 773, 779 (Fed. Cir. 1985).

Appellant argues that the amount of excess reducing agent would have to be significantly above stoichiometric if one wanted to remove chlorine and additional halogen (brief, page 7). Appellant's claim 11, however, does not require that a halogen other than chlorine be removed. Moreover, regarding the rejection over Wilson in view of Takatomi, the examiner argues that Wilson discloses use of excess reducing agent

Appeal No. 1998-2349  
Application 08/586,874

(answer, pages 7-8), and appellant does not challenge this argument. The record, therefore, indicates that the applied references would have fairly suggested, to one of ordinary skill in the art, use of excess reducing agent to remove chlorine after a step wherein an anion exchange resin is used to remove iron.

For the above reasons, we affirm the rejections of claim 11.

*Claim 13*

Appellant's claim 13 requires the presence of coloring amounts of each of chlorine and bromine.

The examiner argues that there is no minimum amount of bromine required by claim 13, and that the amount can be at the impurity level (answer, page 6). The examiner is correct only if an impurity level is a coloring amount as required by the claim, and the examiner has not established that an impurity level is a coloring amount.

The examiner argues that any bromine present inherently would be removed by Takatomi's hydroxylamine chlorate (answer, page 6). That may be correct, but for a *prima facie* case of

Appeal No. 1998-2349  
Application 08/586,874

obviousness to be established, the applied prior art must have provided one of ordinary skill in the art with a motivation to remove bromine and a reasonable expectation of success in doing so. See *In re Vaeck*, 947 F.2d 488, 493, 20 USPQ2d 1438, 1442 (Fed. Cir. 1991); *In re O'Farrell*, 853 F.2d 894, 902, 7 USPQ2d 1673, 1680 (Fed. Cir. 1988). Appellant acknowledges that it was known in the art that free bromine causes hydrochloric acid to have a yellow color (specification, page 1). Thus, one of ordinary skill in the art would have been motivated to remove the bromine. The examiner, however, has not established that one of ordinary skill in the art would have had a reasonable expectation of success in doing so. That is, the examiner has not established that one of ordinary skill in the art would have reasonably expected 1) Takatomi's strong anion exchange resin to function effectively in the presence of bromine, and 2) the reductants of Takatomi and Wilson to be effective for removing bromine. Hence, the examiner has not established that it would have been *prima facie* obviousness to one of ordinary skill in the art to apply the processes of the applied references to hydrochloric acid

Appeal No. 1998-2349  
Application 08/586,874

containing bromine. Consequently, we reverse the rejections of claim 13.

*DECISION*

The rejections of claims 8-12 under 35 U.S.C. § 103 over Takatomi and over Wilson in view of Takatomi are affirmed. The rejections of claim 13 under 35 U.S.C. § 103 over Takatomi and over Wilson in view of Takatomi are reversed.

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*

	)	
TERRY J. OWENS	)	
Administrative Patent Judge	)	BOARD OF PATENT
	)	
	)	APPEALS AND
	)	
THOMAS A. WALTZ	)	INTERFERENCES
Administrative Patent Judge	)	

Appeal No. 1998-2349  
Application 08/586,874

TIMM, *Administrative Patent Judge*, dissenting-in-part.

I respectfully dissent-in-part from the majority's disposition of this case. I do so because I believe the examiner has not produced a sufficient amount of evidence to establish a *prima facie* case of obviousness with respect to the subject matter of any of the claims on appeal. Accordingly, I would reverse all the rejections.

In order to establish a *prima facie* case of obviousness, there must be a suggestion to do what the appellant has done and that suggestion must come from the prior art and not from the appellant's own disclosure. "A critical step in analyzing the patentability of claims pursuant to section 103(a) is casting the mind back to the time of invention, to consider the thinking of one of ordinary skill in the art, guided only by the prior art references and the then-accepted wisdom in

Appeal No. 1998-2349  
Application 08/586,874

the field." *In re Kotzab*, 217 F.3d 1365, 1369-70, 55 USPQ2d 1313, 1316-17 (Fed. Cir. 2000). "The invention must be viewed not with the blueprint drawn by the inventor, but in the state of the art that existed at the time." *In re Dembiczak*, 175 F.3d 994, 999, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999)(quoting *Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 1138, 227 USPQ 543, 547 (Fed. Cir. 1985). To establish a *prima facie* case of obviousness, "there must be some 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).

The majority opinion, after careful consideration of the facts as apparent from their opinion, arrives at the conclusion that the claims define only obvious subject matter based on the finding that:

Takatomi would have fairly suggested two approaches to one of ordinary skill in the art. One is Takatomi's approach, which is to carry out the chloride removal upstream of the anion exchange resin. This approach has the advantage of preventing loss of anion exchange capacity, but has the disadvantage of requiring the use of low-activated carbon to remove the chloride. The second approach is to place the anion exchange resin upstream of the chlorine removal. This approach has the advantage of permitting use of

Appeal No. 1998-2349  
Application 08/586,874

high-activated carbon for chlorine removal and avoiding, due to the iron being removed upstream of the high-activated carbon, any reduction of the iron by the high-activated carbon, but has the disadvantage of some loss of anion exchange resin capacity. The fair suggestion, to one of ordinary skill in the art, of this second approach would have rendered the method recited in appellant's claim 8 *prima facie* obvious to such a person.

My point of disagreement lies here: I do not believe that Takatomi fairly suggests the second approach nor the advantage of the second approach expressed by my colleagues. Takatomi teaches only processes in which chlorine is removed upstream from the iron removing anion exchange resin. Takatomi expresses a specific reason for performing the chlorine removal before iron removal, i.e. removing the free chlorine prevents oxidation and partial loss of the exchange capacity of the anion exchange resin (Takatomi, page 2). There is no mention of reversing the steps of chlorine and iron removal in the reference and the examiner has pointed to no specific evidence that performing iron removal first was known in any process of purifying hydrochloric acid. Nor has the examiner presented any evidence or convincing technical reasoning that those of ordinary skill in the art would have found it permissible in this type of process to allow oxidation and

Appeal No. 1998-2349  
Application 08/586,874

partial loss of exchange capacity of the anion exchange resin. Furthermore, there is no evidence or technical reasoning advanced by the examiner tending to show that using high-activated carbon after iron removal would have been reasonably expected to offer enough of a benefit to sufficiently mitigate the disadvantage created by the loss of anion exchange resin capacity. In my view, there is no factual basis to support the finding that the second approach, as the majority calls it, was known in the art at the time of invention or that there was a reason, suggestion or motivation, understood by those of ordinary skill in the art, for reversing the order of the steps.

"In proceedings before the Patent and Trademark Office, the examiner bears the burden of establishing a *prima facie* case of obviousness based upon the prior art." *In re Fritsch*, 972 F.2d 1260, 1265, 23 USPQ2d 1780, 1783 (Fed. Cir. 1992). The mere fact that the prior art could be modified as proposed by the examiner is not sufficient to establish a *prima facie* case. See *Fritsch*, 972 F.2d at 1266, 23 USPQ2d at 1783-84. "[A] determination of obviousness must be based on

Appeal No. 1998-2349  
Application 08/586,874

facts and not on unsupported generalities." *In re Freed*, 425 F.2d 785, 787, 165 USPQ 570, 571 (CCPA 1970). In my opinion, based on the current record, there is an insufficient factual basis to support a *prima facie* case of obviousness over Takatomi. Furthermore, Wilson does not remedy the deficiency. Accordingly, I would not sustain any of the examiner's rejections.

CATHERINE TIMM  
Administrative Patent Judge

) BOARD OF PATENT  
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) APPEALS AND  
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INTERFERENCES

WENDEROTH, LIND & PONACK  
2033 K STREET, N.W., SUITE 800  
WASHINGTON, DC 20006

Appeal No. 1998-2349  
Application 08/586,874

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