

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. 44

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex Parte* JEAN-PIERRE SCHIRMANN,  
JEAN-PIERRE PLEUVRY  
and PIERRE TELLIER

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Appeal No. 1996-1132  
Application 08/217,752

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HEARD April 25, 2001

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Before, KIMLIN, KRATZ and JEFFREY T. SMITH, *Administrative Patent Judges*.

JEFFREY T. SMITH, *Administrative Patent Judge*.

*Decision on appeal under 35 U.S.C. § 134*

Applicants appeal the decision of the Primary Examiner finally rejecting claims 1, 3-10 and 12-22. We have jurisdiction under 35 U.S.C. § 134.

### ***BACKGROUND***

The invention is directed to a continuous process for producing azine compounds by the reaction of hydrogen peroxide, ammonia and a ketone or aldehyde compound.

Claim 1 which is representative of the invention is reproduced below:

1. A process for the continuous production of an azine, comprising
  - (i) establishing a loop having an azine reaction zone, means for separating azine final product from said circulating reaction medium, means for heating said reaction medium, and for purging water therefrom, and means for recycling heated and purged reaction medium to said azine reaction zone,
  - (ii) introducing hydrogen peroxide, ammonia and a ketone or aldehyde compound into said circulating reaction medium in said reaction zone,
  - (iii) withdrawing azine final product thus formed from said circulating reaction medium to maintain the volume thereof essentially constant,
  - (iv) heating said circulating reaction medium to a temperature of at least 130°C,
  - (v) recycling thus heated reaction medium to said azine reaction zone, and
  - (vi), at any point along said loop, introducing a reagent selected from the group consisting of oxyacids, ammonium salts of oxyacids, or anhydrides, esters, amides, nitrides and acyl peroxides of oxyacids into said circulating reaction medium as to essentially maintain the equilibrium of the azine-forming reaction.

Appeal No. 1996-1132  
Application No. 08/217,752

***PRIOR ART***

As evidence of obviousness, the Examiner relies on the following references:

Weiss et al. (Weiss)	3,869,541	Mar. 4, 1975
Eichenhofer et al. (Eichenhofer)	4,005,179	Jan. 25, 1977
Schirmann et al. (Schirmann)	4,093,656	June 6, 1978

Schirmann describes a process for producing azines by the reaction of hydrogen peroxide, ammonia and a ketone or aldehyde, in the presence of an amide of a carboxylic acid. (Col. 1, ll. 63-68). The reaction is capable of taking place in a continuous or discontinuous process. (Col. 4, ll. 12-13). The reactants can be employed in stoichiometric amounts or in the following amounts: 0.2 to 5 moles of aldehyde or ketone; 0.1 to 10 moles of ammonia; 1 to 5 moles of amide and of ammonia salt per mole of hydrogen peroxide. (Col. 3, ll. 16-26). Suitable amides include amides of monocarboxylic acid (oxyacid derivatives) for example, amides corresponding to formic, acetic and propionic acids. (Col. 2, ll. 54-68). Schirmann discloses the reactants can be introduced separately or simultaneously. (Col. 3, l. 61 to col.4, l. 11). The process can take place at atmospheric pressure or elevated pressure up to 10 atmospheres. (Col.3, ll. 53-57).

Weiss describes a process for producing hydrazines compounds by the reacting a ketone, hydrogen peroxide, ammonia and nitrile to produce a ketazine and

Appeal No. 1996-1132  
Application No. 08/217,752

carboxylic amide. (Col. 1, ll. 5-14). The ammonia, hydrogen peroxide and nitrile can be recovered from the reaction medium, which includes water, by fractional distillation. (Col. 3, ll. 12-15 and col. 5, ll. 12-18). Weiss discloses the components such as nitrile and ketone are recycled for the production of ketazine. (Col. 3, ll. 15-24). Weiss discloses the ingredients can be separated from the reaction medium by fractional distillation. Weiss discloses during separation temperatures above 120°C can be used at appropriate distillation pressure. However, care must be taken to prevent hydrolysis. (Weiss, col. 6, ll. 4-16). Example 2 describes the production acetoneazine wherein fresh ingredients are added to recycled ingredients. (Col. 8, ll. 33-56).

Eichenhofer describes synthesis solutions used in the process of producing hydrazines compounds. Ammonia and acetone are recycled prior to synthesis of the hydrazine. (Col. 5, ll. 60-65). The synthesis solutions may include ketones, alcohol, ammonia, and nitriles which can be recycled. (Col. 6, ll. 56-64). Eichenhofer discloses the aqueous solutions, which are removed in various stages of the process, are subject to a stripping stage for removal and recycling of extractants. (Col. 7, ll. 27-34).

Appeal No. 1996-1132  
Application No. 08/217,752

### ***THE REJECTION***

The Examiner entered the following ground of rejection:

Claims 1, 3-10 and 12-22 are rejected as unpatentable under 35 U.S.C. § 103 over the combination of Schirmann, Weiss and Eichenhofer. (Examiner's Answer, page 5).

Appellants have indicated (Brief, page 3) that, for the purposes of this appeal, claims 1, 3-10 and 12-22 will stand or fall together. Accordingly, we will select one claim as representative of all of the claims on appeal. Note *In re King*, 801 F.2d 1324, 1325, 231 USPQ 136, 137 (Fed. Cir. 1986); *In re Sernaker*, 702 F.2d 989, 991, 217 USPQ 1, 3 (Fed. Cir. 1983). We will limit our discussion to claim 1 which is the sole independent claim.

### ***OPINION***

Upon careful review of the entire record including the respective positions advanced by Appellants and the Examiner, we find that the Examiner has carried his burden of establishing a *prima facie* case of obviousness and that this *prima facie* case has not been effectively rebutted by Appellants. *See In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992); *In re Piasecki*, 745 F.2d 1468, 1471-

Appeal No. 1996-1132  
Application No. 08/217,752

1472, 223 USPQ 785, 787-788 (Fed. Cir. 1984). Accordingly, we will sustain the Examiner's rejection.

The Appellants assert the claimed invention is patentable over the combination of Schirmann, Weiss and Eichenhofer. According to the Appellants, Schirmann does not teach or suggest the present invention and Weiss and Eichenhofer do not remedy the deficiencies. Appellants' position is represented by the following excerpts from the brief:

[C]ontrary to the position taken by the Examiner during prosecution, the novelty of the present invention is not attributable to the continuous operation of the reactor. Schirmann '656 clearly describes a process wherein acetamide, ketone, acetate, EDTA, disodium phosphate, water, and hydrogen peroxide or variations thereof, are continually fed into a continuously operating reactor. However, in the continuous process of Schirmann '656 the reaction medium is **not continuously circulated**. Thus, the process of the present invention is clearly advantageous to the process of Schirmann '656 because it is simpler and cheaper, and requires less monitoring and the addition of the fewer reagents.

....

Appellants respectfully submit that the Examiner has oversimplified the differences between the claimed invention vis-a-vis the invention of Schirmann '656. As discussed, the claimed method does not differ from Schirmann '656 merely in the additional presence of a recycle step. Instead, it differs in the fact that the claimed invention provides for continuous circulation of reaction medium heated to at least 130°C. Moreover, this distinction is not taught or suggested by the secondary references.

....

[C]ontrary to the position taken by the Examiner, the claimed method does not comprise the "straight forward" addition of one of a plurality of

Appeal No. 1996-1132  
Application No. 08/217,752

make-up streams needed. Appellants acknowledge that Eichenhofer '179 and Weiss '541 describe that components of the reaction mixtures may be separated and recycled. However, there is no suggestion in either Eichenhofer '179 or Weiss '541 that the reaction of the present invention may or should be carried out by a process including the recited combination of steps...

(¶ bridging pages 9-10; page 10, third ¶; and ¶ bridging pages 11-12)

The Schirmann reference indicates that one of ordinary skill in the art would have recognized that azine compounds can be formed by continuous process. Schirmann discloses the ingredients suitable for forming azines include amides of oxyacids. (Col. 2, ll. 54-68). Eichenhofer and Weiss disclose that components of the reaction mixtures used in the formation of azine compounds may be separated and recycled. Weiss discloses the ingredients can be separated from the reaction medium by fractional distillation. Weiss also discloses the recycled materials are combined with fresh ingredients during the production of azine compounds. (See Example 2). Thus, one of ordinary skill in the art would have recognized that the ingredients used in the formation of azine compounds can be formed in a continuous process wherein the recirculated ingredients are supplemented with fresh ingredients. Amides of oxyacids, as disclosed by Schirmann, would have been included in these supplemented ingredients. The use of recycled ingredients would reduce the amount of fresh ingredients added to the reaction system and result in a cost savings.

Appellants assert the references do not suggest or render obvious the step wherein the working solution is heating the reaction medium to at least 130°C. (Brief, paragraph bridging pages 11-12). According to the specification, page 10, water is eliminated by distillation and components which are more volatile than water are recovered. The recovered components are returned to the reactor. Distillation is a well known method for separating components with various boiling points for recycling. As stated above, Weiss discloses the ingredients can be separated from the reaction medium by fractional distillation. Weiss discloses temperatures above 120°C can be used at appropriate distillation pressure, however, care must be taken during separation to prevent hydrolysis. (Weiss, col. 6, ll. 4-16). Consequently, one of ordinary skill in the art would have been motivated to use a temperature above 120°C, including temperatures of at least 130°C, depending on the ingredient which was to be removed from the reaction medium.<sup>1</sup>

Appellants assert avoiding the need for monitoring the composition of the recycled working solution is an unexpected result that is not taught or suggested by the prior art. (Brief, pg. 13). Claim 1 is not limited to the scope of Appellants' assertion. Further, claim 1 does not exclude the monitoring of the working solution to determine

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<sup>1</sup> Appellants' representative acknowledged during the Hearing that the heating of the reaction medium to at least 130°C could result from the heat of distillation.

Appeal No. 1996-1132  
Application No. 08/217,752

the appropriate amount of fresh ingredients which would be needed for maximum production of azine compounds. Appellants have also failed to explain why the results would have been unexpected by one of ordinary skill in the art. *See In re Freeman*, 474 F.2d 1318, 1324, 177 USPQ 139, 143 (CCPA 1973); *In re Klosak*, 455 F.2d 1077, 1080, 173 USPQ 14, 16 (CCPA 1972).

### ***CONCLUSION***

The rejection of claims 1, 3-10 and 12-22 as unpatentable under 35 U.S.C. § 103 over the combination of Schirmann, Weiss and Eichenhofer is affirmed.

Appeal No. 1996-1132  
Application No. 08/217,752

Time for taking action

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

**AFFIRMED**

EDWARD C. KIMLIN  
Administrative Patent Judge

PETER F. KRATZ  
Administrative Patent Judge

JEFFREY T. SMITH  
Administrative Patent Judge

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Appeal No. 1996-1132  
Application No. 08/217,752

NORMAN H. STEPNO  
BURNS, DOANE, SWECKER & MATHIS  
P. O. BOX 1404  
ALEXANDRIA, VA 22313-1404