

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. 21

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex Parte ULRICH HAMMON,  
HOLGER HERBST and GERHARD NESTLER

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Appeal No. 2003-0849  
Application 09/622,916

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HEARD: November 18, 2003

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Before WALTZ<sup>1</sup>, 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 rejecting claims 1 to 15, all of the pending claims in the application.<sup>2</sup> We have jurisdiction under 35 U.S.C. § 134.

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<sup>1</sup> Paul Lieberman, Administrative Patent Judge, who participated in the oral hearing for this appeal, is now retired. Therefore, Thomas A. Waltz, Administrative Patent Judge, has been added to the panel for participation in the subject decision. Reargument is not required. See In re Bose Corp., 772 F.2d 866, 869, 227 USPQ 1, 4 (Fed. Cir. 1985).

<sup>2</sup> In rendering our decision we have considered Appellants' position present in the Brief, filed March 26, 2002 and the Reply Brief, filed July 17, 2002.

***THE INVENTION***

The Appellants' invention relates to a process for the rectificative isolation of acrylic or methacrylic acid from a mixture. The mixture contains acrylic or methacrylic acid, as main components, and an organic liquid having a boiling point higher than acrylic or methacrylic acid. The rectification is carried out with the addition of a surfactant. (Brief, p. 2). Claims 1 and 10 are illustrative:

1. A process for the rectificative isolation of acrylic or methacrylic acid from a mixture containing, as main components, acrylic or methacrylic acid and an organic liquid having a higher boiling point than said acrylic or methacrylic acid, wherein the rectification is carried out with the addition of a surfactant.
10. A process for the preparation of acrylic or methacrylic acid by catalytic gas-phase oxidation of a C<sub>3</sub>-/C<sub>4</sub>-starting compound, in which the reaction gas mixture of the gas-phase oxidation is passed in countercurrent to a descending high-boiling point inert hydrophobic organic liquid in an absorption column, the liquid discharge of the absorption column is then stripped with inert gas in a desorption column and said acrylic or methacrylic acid is isolated from the liquid discharge of the desorption column by rectification, wherein the rectificative isolation is carried out with the addition of a surfactant.

**THE REJECTION<sup>3</sup>**

The Examiner rejected claims 1 to 15 under 35 U.S.C. § 103(a) as obvious over the combination of Herbst, Frank and Egly.<sup>4</sup> (Answer, pp. 5-6).

**OPINION**

Upon careful review of the respective positions advanced by Appellants and the Examiner, we find ourselves in agreement with Appellants' position in that the Examiner has failed to carry the burden of establishing a *prima facie* case of obviousness. *See In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992); *In re Piasecki*, 745 F.2d 1468, 1471-72, 223 USPQ 785, 787-88 (Fed. Cir. 1984). Accordingly, we will not sustain the Examiner's rejections. We will limit our discussion to independent claims 1 and 10.

We find claims 1 and 10 are directed to a process for the production of acrylic or methacrylic acid. The process comprises the rectificative isolation of

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<sup>3</sup> The Examiner relied on the following references in the prior art rejection:

Frank et al. (Frank)	4,600,795	Jul. 15, 1986
Egly et al. (Egly)		5,780,679
Jul. 14, 1998		
Herbst et al. (Herbst)	EP 0717029	Jun. 19, 1996

<sup>4</sup> In rendering this decision we have considered the English language translation of the Herbst reference which has been filed in the record.

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acrylic or methacrylic acid from a liquid. The claimed subject matter requires the rectificative isolation to be carried out with the addition of a surfactant.

According to the Examiner, Herbst teaches a process for the rectificative isolation of acrylic or methacrylic acid from an organic liquid. The Examiner acknowledges that Herbst does not disclose the use of a surfactant in the rectificative process. The Examiner asserts that Egly discloses the use of a polymerization inhibitor, phenothiazine, and Frank discloses the use of surfactants in the recovery and purification of methacrylic acid. Specifically the Examiner states:

Herbst et al teaches a process for the separation, by rectification, of (meth)acrylic acid from a mixture containing (meth)acrylic acid and an inert hydrophobic organic liquid with a higher boiling point than (meth)acrylic acid in the presence of a primary amine (see claim 1 on page 20 of the English translation of Herbst et al). Herbst et al does not teach the use of surfactant to reduce the formation of polymers during the rectification process. Although Egly et al teaches the use of phenothiazine (i.e., an amine) as the polymerization inhibitor (Col. 4:56-59) it is Frank et al who teaches that in the recovery and purification of methacrylic acid the problem of plugging is avoided by the use of surfactants (see Frank's abstract). Frank et al further teaches that the surfactant prevents methacrylic acid from adhering to the pipe walls and forming polymerization sites (Col. 2:37-40). Therefore, the instantly claimed process would have been obvious to one of ordinary skill in the art at the time the invention was made. In order to prevent formation of polymer of (meth)acrylic acid on the wall of the apparatus used in the process for isolation of (meth)acrylic acid (i.e., the process of Herbst et al), the addition of a surfactant, as taught by Frank et al, provides the requisite motivation.  
Answer, pages 5-6.

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Appellants argue that the process of Frank takes place at an earlier stage prior to the purification and recovery of methacrylic acid (i.e., before a rectification process). According to Appellants, Frank adds a surfactant while the methacrylic acid in water is in the gaseous state and not during a rectification process. The Appellants also argue that in Frank the surfactant is added at or near the point of condensation of a gaseous effluent containing methacrylic acid not during the rectification, as in Herbst. Consequently, without knowledge of the present invention it would have been nearly impossible to predict what effect the addition of the surfactant would have if added during rectification. (Brief, pp. 4-5).

In response, the Examiner asserts that “the surfactant is known to prevent the polymerization of methacrylic acid; it can do so in the rectification process or as in the case of Frank et al in the downstream portion of the reactor train (Col. 2:21-27). In fact Frank et al’s caveat about the addition of the surfactant is that the surfactant material should *not be introduced* ‘at a point in which the temperature is at or above the point of the decomposition of the surfactant material’ (Col. 2:28-30). In other words, as long as the temperature of the medium is below the decomposition point of the surfactant, the surfactant can be used.” (Answer, p. 6).

The Examiner has not provided adequate reasons why there is motivation to combine the references and why such a combination would have rendered the

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claimed subject matter unpatentable under 35 U.S.C. § 103(a). There is no indication in the cited references that the surfactant used with the methacrylic acid and water vapor disclosed in Frank would have been expected to be suitable for use in the process for the rectificative isolation of acrylic or methacrylic acid from an organic liquid as disclosed in Herbst. The mere fact that the prior art could be modified as proposed by the Examiner is not sufficient to establish a *prima facie* case of obviousness. *See In re Fritch*, 972 F.2d 1260, 1266, 23 USPQ2d 1780, 1783 (Fed. Cir. 1992). The Examiner must explain why the prior art would have suggested to one of ordinary skill in the art the desirability of the modification. *See Fritch*, 972 F.2d at 1266, 23 USPQ2d at 1783-84. The Examiner has failed to cite evidence in the prior art that the suggestion to modify the cited references as proposed by the Examiner.

The record indicates that the motivation relied upon by the Examiner for adding a surfactant to the recertification process of Herbst comes from the Appellants' description of their invention in the specification rather than coming from the applied prior art and that, therefore, the Examiner used impermissible hindsight in rejecting the claims. *See W.L. Gore & Associates v. Garlock, Inc.*, 721 F.2d 1540, 1553, 220 USPQ 303, 312-13 (Fed. Cir. 1983); *In re Rothermel*, 276 F.2d 393, 396, 125 USPQ 328, 331 (CCPA 1960). Accordingly, we reverse the

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Examiner's rejection under 35 U.S.C. § 103(a) over the combination of Herbst, Frank and Egly. The rejection of claims 1-15 is reversed.

Since we reverse for the lack of the presentation of a *prima facie* case of obviousness by the Examiner, we need not reach the issue of the sufficiency of the evidence as allegedly demonstrating unexpected results. *See In re Geiger*, 815 F.2d 686, 688, 2 USPQ2d 1276, 1278 (Fed. Cir. 1987).



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OBLON, SPIVAK, MCCLELLAND, MAIER  
& NEUSTADT, P.C.  
1940 DUKE STREET  
ALEXANDRIA, VA 22314