U.S. Patent No.: 8,865,921 Paper No. \_\_\_\_
Petitioners' Reply

## UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

E. I. DU PONT DE NEMOURS AND COMPANY and ARCHER-DANIELS-MIDLAND COMPANY, Petitioners,

V.

FURANIX TECHNOLOGIES B.V., Patent Owner.

Inter Partes Review No.: IPR2015-01838 U.S. Patent No. 8,865,921

**PETITIONERS' REPLY** 



## **TABLE OF CONTENTS**

Page No.

I.	Intro	Introduction & Summary of Argument			
II.	Argument			2	
	A.	Person Having Ordinary Skill in the Art			
	B.	Claim Construction.			
		1.	"Between 140° C. and 200° C."	3	
		2.	"At an Oxygen Partial Pressure of 1 to 10 bar"	3	
		3.	Claim Terms Not Present	4	
	C.	Claims 1-5 of the '921 patent are unpatentable as obvious over the '732 publication in view of RU '177 and the '318 publication		5	
		1.	The Prior Art	5	
		2.	Secondary Considerations	15	
	D.	O. Claims 7-9 of the '921 patent are obvious.		26	
III.	Conc	Conclusion			



# **TABLE OF AUTHORITIES**

	Page(s)
Cases	
In re Aller, 220 F.2d 454 (C.C.P.A. 1955)	9
In re Applied Materials, Inc., 692 F.3d 1289 (Fed. Cir. 2012)	7
EWP Corp. v. Reliance Universal Inc., 755 F.2d 898 (Fed. Cir. 1985)	6
In re Peterson, 315 F.3d 1325 (Fed. Cir. 2003)	6
Titanium Metals Corp. v. Banner, 778 F.2d 775 (Fed. Cir. 1985)	15
In re Wertheim, 541 F.2d 257 (C.C.P.A. 1976)	14
In re Woodruff, 919 F.2d 1575 (Fed. Cir. 1990)	15



#### **UPDATED LISTING OF EXHIBITS**

Exhibit 1001: U.S. Patent No. 8,865,921 B2 (filed Oct. 6, 2010).

Exhibit 1002: International Application Publication WO 01/072732 A2 (filed

Mar. 27, 2001).

Exhibit 1003: Walt Partenheimer et al., Synthesis of 2,5-Diformylfuran and

Furan-2,5-Dicarboxylic Acid by Catalytic Air-Oxidation of 5-

Hydroxymethylfurfural. Unexpectedly Selective Aerobic

Oxidation of Benzyl Alcohol to Benzaldehyde with

Metal/Bromide Catalysts, ADV. SYNTH. CATAL. 2001, 343,

NO. 1, Published Online on Feb. 6, 2001.

Exhibit 1004: U.S. Patent No. 8,558,018 B2 (filed May 14, 2010).

Exhibit 1005: Jaroslaw Lewkowski, Synthesis, Chemistry and Applications of

5- Hydroxymethylfurfural and its Derivatives, ARKIVOC 2001

(i) 17-54, Published Online on Aug. 8, 2001.

Exhibit 1006: Shigeru Oae et al., A Study of the Acid Dissociation of Furan-

and Thiophenedicarboxylic Acids and of the Alkaline

Hydrolysis of Their Methyl Esters, SOC. JPN. 1965, 38, Aug.

1965, at 1247.

Exhibit 1007: USSR Patent RU-448177A1 (filed Oct. 30, 1972) (cited to

Certified English Language Translation).

Exhibit 1008: U.S. Patent Publication No. US 2008/0103318 (filed Oct. 31,

2007).

Exhibit 1009: Declaration of Dr. Kevin J. Martin.

Exhibit 1010: Prosecution History of European Patent Application No. 2 486

028 A0 (filed Oct. 7, 2009).

Exhibit 1011: Prosecution History of U.S. Patent No. 8,865,921 B2.



Exhibit 1012: Brian S. Furniss et al., VOGEL'S TEXTBOOK OF PRACTICAL ORGANIC CHEMISTRY (5th ed. 1989).

Exhibit 1013: U.S. Patent No. 2,628,249 (filed Jan. 3, 1951).

Exhibit 1014: D.R. Kreile et al., Liquid-Phase Catalytic Oxidation of 5-Methylfurfural, Zhurnal Vsesoyuznogo Khimicheskogo Obshchestva, Vol. 22, 1977.

Exhibit 1015: CV of Dr. Kevin J. Martin.

Exhibit 1016: International Application Publication WO 2007/146636 A1 (filed June 4, 2007).

Exhibit 1017: U.S. Patent No. 3,071,599 B2 (filed Feb. 25, 1959).

Exhibit 1018: B. F. M. Kuster, 5-Hydroxymethylfurfural (HMF). A Review Focusing on its Manufacture, Starch/ Stärke, 42, 1990, at 314.

Exhibit 1019: G.B. Patent Specification No. 621,971 (filed Nov. 12, 1946).

Exhibit 1020: Claude Moreau et al., Recent Catalytic Advances in the Chemistry of Substituted Furans from Carbohydrats and in the Ensuing Polymers, Topics in Catalysis Vol. 27, Nos. 1-4, Feb. 2004, at 11.

Exhibit 1021: MCGRAW-HILL ENCYCLOPEDIA OF CHEMISTRY, (Sybil P. Parker et al. eds., 5th ed. 1983).

Exhibit 1022: U.S. Patent Publication No. 2009/0156841 (filed Dec. 12, 2008).

Exhibit 1023: U.S. Patent No. 4,792,621 (filed Jul. 28, 1986).

Exhibit 1024: HAWLEY'S CONDENSED CHEMICAL DICTIONARY (13th ed. 1997 at 92).

Exhibit 1025: U.S. PATENT NO. 5,099,064 (FILED MAR. 24, 1992).



# DOCKET

# Explore Litigation Insights



Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

# **Real-Time Litigation Alerts**



Keep your litigation team up-to-date with **real-time** alerts and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

## **Advanced Docket Research**



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

## **Analytics At Your Fingertips**



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

### API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

#### **LAW FIRMS**

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

#### **FINANCIAL INSTITUTIONS**

Litigation and bankruptcy checks for companies and debtors.

### **E-DISCOVERY AND LEGAL VENDORS**

Sync your system to PACER to automate legal marketing.

