

Filed on behalf of Petitioner

By: Elisabeth H. Hunt  
Richard F. Giunta  
Randy J. Pritzker  
WOLF, GREENFIELD & SACKS, P.C.  
600 Atlantic Avenue  
Boston, MA 02210  
Tel: (617) 646-8000  
Fax: (617) 646-8646  
[EHunt-PTAB@wolfgreenfield.com](mailto:EHunt-PTAB@wolfgreenfield.com)

UNITED STATES PATENT AND TRADEMARK OFFICE

---

BEFORE THE PATENT TRIAL AND APPEAL BOARD

---

RPX Corporation,  
Petitioner,

v.

Digital Audio Encoding Systems, LLC,  
Patent Owner.

---

Case No. TBD  
Patent No. 7,490,037

---

**DECLARATION OF SCHUYLER QUACKENBUSH, PH.D.**

RPX Exhibit 1202

## TABLE OF CONTENTS

I.	PERSONAL AND PROFESSIONAL BACKGROUND .....	1
II.	MATERIALS REVIEWED AND CONSIDERED .....	4
III.	LEVEL OF ORDINARY SKILL IN THE ART .....	7
IV.	THE BASICS OF DIGITAL SIGNAL ENCODING .....	8
V.	SUMMARY OF THE '037 PATENT CLAIMS.....	14
VI.	CLAIMS 1-32 ARE ANTICIPATED OR OBVIOUS IN LIGHT OF THE PRIOR ART IDENTIFIED IN RPX'S PETITION.....	23
A.	The Claims in International Patent Application Publication No. WO 99/01948 Disclose Each Limitation of Claims 1-31 of the '037 Patent .....	25
B.	Ferriere Discloses Each Limitation of Claims 1-4, 9-11, 13, 17-21, 24, 25, 29, 31, and 32 of the '037 Patent, and Renders Claims 7, 12, 14, and 15 Obvious.....	32
C.	Ferriere Renders Independent Claims 1 and 17, and Dependent Claims 2-4, 7, 9-15, 18-21, 24, 25, 29, 31, and 32 of the '037 Patent Obvious.....	91
D.	Ferriere and Kalra Render Claims 5 and 6 of the '037 Patent Obvious.....	94
E.	Ferriere and Schulzrinne Render Claims 8, 23, 26, and 30 of the '037 Patent Obvious .....	98
F.	Ferriere and Chen Render Claim 11 of the '037 Patent Obvious .....	106
G.	Ferriere and Hluchyj Render Claim 22 of the '037 Patent Obvious .....	108
H.	Ferriere and Riddle Render Claim 27 of the '037 Patent Obvious .....	111
I.	Ferriere and Barraclough Render Claims 28 and 30 of the '037 Patent Obvious.....	115
J.	Ferriere and Lin Render Claim 32 of the '037 Patent Obvious .....	120
K.	Ferriere and Kudo Render Independent Claims 1 and 17 of the '037 Patent Obvious, and Likewise Dependent Claims 2-15, 18-21, and 23-32 Would Have Been Obvious over Ferriere and Kudo, or over Ferriere and Kudo in Combination with Other References .....	123

L. Goetz Discloses Each Limitation of Claims 1, 2, 10, 11, 13, 17, 20-22, 24-26, and 29 of the '037 Patent, and Renders Claims 8, 9, 12, 14, and 23 Obvious .....	128
M. Goetz Renders Independent Claims 1 and 17, and Dependent Claims 2, 8-14, 20-26, and 29 of the '037 Patent Obvious .....	167
N. Goetz and Cannon Render Claims 2-4, 15, 18, and 19 of the '037 Patent Obvious.....	169
O. Goetz and Kalra Render Claim 5 of the '037 Patent Obvious .....	179
P. Goetz, Cannon, and Kalra Render Claims 6 and 15 of the '037 Patent Obvious.....	183
Q. Goetz and Walsh Render Claim 8 of the '037 Patent Obvious.....	186
R. Goetz and Brandenburg Render Claim 11 of the '037 Patent Obvious.....	188
S. Goetz and Krueger Render Claims 20 and 28 of the '037 Patent Obvious.....	190
T. Goetz and RealAudio Render Claims 27 and 30 of the '037 Patent Obvious.....	196
U. Goetz and Ferriere Render Claim 32 of the '037 Patent Obvious .....	201
V. Goetz and Lin Render Claim 32 of the '037 Patent Obvious .....	204
VII. SIGNATURE.....	207

I, Schuyler Quackenbush, Ph.D., declare:

1. I have been retained by Petitioner RPX Corporation (“RPX”), to assess U.S. Patent No. 7,490,037 (“the ‘037 patent). I am being compensated for my time at a rate of \$400 per hour, plus actual expenses. My compensation is not dependent in any way upon the outcome of RPX’s petition.

2. I understand that this declaration is being submitted in connection with three petitions regarding the same ‘037 patent, and that while the exhibits to all three petitions are the same, they are required to have different numbering. Therefore, when I cite to an exhibit in this declaration, I provide all three of the exhibit’s numbers, one for each petition. For example, the ‘037 patent is Ex. 1001 in one petition, Ex. 1101 in the second petition, and Ex. 1201 in the third petition; I therefore cite it as “Ex. 1001/1101/1201.”

## **I. PERSONAL AND PROFESSIONAL BACKGROUND**

3. I am currently the founder and CEO of Audio Research Labs, LLC, a media technology consulting company that has developed and sells products for subjective audio evaluation and for multi-channel audio mixing. I have been active in standardization of encoding formats for compressed media: I have participated in the ISO/IEC MPEG process since 1995 and am currently Chair of the MPEG Audio subgroup. I am also an adjunct professor at New York University’s

Steinhardt School, where I teach the graduate-level course “Introduction to Perceptual Audio Coding.”

4. I received a Bachelor of Science in Engineering degree in Electrical Engineering from Princeton University in 1975. I received a Master of Science degree in Electrical Engineering from the Georgia Institute of Technology (“Georgia Tech”) in 1980, specializing in Signal Processing. I received a Ph.D. in Electrical Engineering from Georgia Tech in 1985. The subject of my Ph.D. thesis was “Objective Measures of Speech Quality.”

5. From 1986 to 2002, I worked at AT&T Bell Laboratories (Signal Processing Research Department) and AT&T Laboratories (Speech and Audio Research Department and Speech and Audio Coding Group), where I was an expert in audio coding and real-time signal processing. My primary research projects and responsibilities included developing algorithms and corresponding real-time implementations for error mitigation for streaming audio signals using MPEG-2 Advanced Audio Coding (AAC) on 3G cellular and IP channels, contributing to the AAC standard as AT&T’s principal delegate to the MPEG Audio Subgroup, designing the audio encoder and decoder for a U.S. standardization of digital audio broadcast sponsored by the National Association of Broadcasters and the Electronics Industry Association, developing and implementing a streaming client/server music player using the AT&T audio

# 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.