UNITED STATES PATENT AND TRADEMARK OFFICE
WASHINGTON, D.C.

BEFORE THE PATENT TRIAL AND APPEAL BOARD

WAVES AUDIO, LTD.
Petitioner

v.

ANDREA ELECTRONICS CORPORATION
Patent Owner

Case: IPR2016-00459

Patent 6,363,345

DECLARATION OF BERTRAND M. HOCHWALD IN SUPPORT OF PETITION FOR INTER PARTIES REVIEW OF US PATENT 6,363,345

I. INTRODUCTION

1. I, Bertrand M. Hochwald, declare the following to be true and correct to the best of my knowledge. Except where otherwise indicated, I have personal knowledge of the facts below and, if called to do so, would and could testify regarding the matters stated in this report. I make this Declaration in support of inter partes review of US Patent 6,363,345.

2. I have been retained by Denko Lauff LLP on behalf of Waves Audio, Ltd.

3. I have been asked to provide my technical review, analysis, insights, and opinions on the materials I have reviewed in this case related to the '345 patent, including the references that form the basis of the grounds of rejection.

II. QUALIFICATIONS

A. Educational Background

4. In 1995 I received a Ph.D. in Electrical Engineering, and in 1993 an M.A. in Statistics from Yale University. My primary area of study was Statistical Signal Processing. I received an M.S. in Electrical Engineering from Duke University in 1986, and a B.S. in Engineering from Swarthmore College in 1984.

B. Career History

5. I have twenty years of combined industry and academic experience in the research and design of systems for signal processing, and wireless and wireline communications.

6. My most recent appointment, starting in 2011, is with the University of Notre Dame, where I am currently a Freimann Chaired Professor of Electrical Engineering. I teach both graduate and undergraduate classes in Communication Systems and in Signals and Systems, where the emphasis is on the processing of analog and digital signals. My primary areas of research include communication systems, radiofrequency circuits, and signal design and processing. I advise graduate students who are attaining Ph.D. degrees through research and coursework.

7. Prior to Notre Dame, I worked from 2005-2010 at Beceem Communications, a cellular wireless communication chipset start-up company in Santa Clara, California, where I was Chief Scientist and Vice President of Systems Engineering. I was an integral part of the chipset development team. Beceem was bought by Broadcom Corporation in 2010 and no longer exists as a separate company.

8. Prior to Beceem, I worked from 1996-2005 at Lucent Bell Laboratories in New Jersey, where I was as a Distinguished Member of the Technical Staff doing research into communications systems and multiple-antenna systems. This resulted

in many patents and publications across a variety of areas in communication theory, information theory, and circuit design.

9. Prior to Bell Laboratories, I was a Visiting Assistant Professor at the University of Illinois in Urbana-Champaign during the 1995-1996 school year, where I worked on a broad range of research topics related to signal processing and communications.

10. Prior to completing my Ph.D., during 1986-1989 I worked at the Department of Defense as a system engineer for signal processing and wireless communication systems.

C. Publications

11. As indicated in detail in my CV (attached and incorporated as Exhibit 1), I have published approximately 95 articles in scholarly journals, many of them within the journals of the Institute of Electrical and Electronic Engineers (IEEE), one of the premier societies for electrical engineers. I have 37 granted patents in a variety of areas related to communication and signal processing systems. I have been an invited and plenary speaker at several international conferences throughout the world and have received awards and recognition for my research and publications.

D. Other relevant qualifications

12. In addition to my academic and practical experience, I have worked as an expert in the areas of communication and signal processing systems, as detailed in Exhibit 1. I have had experience drafting and successfully prosecuting my own patents, and have worked with other experts in signal processing systems as a co-inventor and co-author.

13. I am being compensated for my time at the rate of $500 per hour for my work in connection with this matter. This compensation is not dependent in any way on the contents of this Declaration, the substance of any further opinions or testimony that I may provide or the ultimate outcome of this matter.

III. MATERIALS REVIEWED

14. In formulating my opinions, I have relied on my knowledge and experience in the field of signal and audio processing, and on the documents and information described below. I have reviewed the following materials:

- U.S. Patent No. 6,363,345 (the '345 patent) and its file history;
- Sources listed in Exhibit 2.

IV. LEGAL PRINCIPLES

15. I will not offer opinions of law because I am not an attorney. However, I have been informed of several principles of patent law, which I used in formulating my opinions.

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