IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re *Inter Partes* Review of:	)
U.S. Patent No. 8,304,935	)
Issued: Nov. 6, 2012	)
Application No.: 12/647,763	)
Filing Date: Dec. 28, 2009	)

For: Wireless Energy Transfer Using Field Shaping to Reduce Loss

DECLARATION OF MARK ALLEN

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I. Introduction

1. I have been retained as an expert witness on behalf of Momentum Dynamics Corporation ("Momentum" or "Petitioner") in the above-captioned *inter partes* review ("IPR") relating to U.S. Patent No. 8,304,935 ("the '935 patent") (Ex. 1001). The '935 patent relates to near-field wireless energy transfer between a "source resonator" and a "second" (or "device") resonator, including shaping the magnetic field using shielding comprising conducting and magnetic materials. '935 patent 2:18-25, 8:5-9.

2. I understand that Momentum is petitioning for IPR of claims 1-23 of the '935 patent and requests that the United States Patent and Trademark Office ("PTO") cancel those claims.

3. In preparing this Declaration, I have reviewed the '935 patent and considered the documents identified in Section III in light of the general knowledge in the relevant art. In forming my opinions, I relied on my education, knowledge, and experience (including my extensive research and development experience with wireless power transfer) and considered the level of ordinary skill in the art as discussed below.

4. I am being compensated for my time in connection with this IPR at my standard consulting rate, which is $625.00 per hour, plus actual expenses. My compensation is not dependent in any way upon the outcome of this matter.

II. Background and Qualifications

5. I received a B.A. degree in Chemistry, a B.S.E. degree in Chemical Engineering, and a B.S.E. degree in Electrical Engineering from the University of Pennsylvania, and a S.M. and Ph.D. (1989) from the Massachusetts Institute of Technology. From 1989 to 2013, I was a member of the faculty of the School of Electrical and Computer Engineering of the Georgia Institute of Technology, ultimately holding the rank of Regents' Professor and the J.M. Pettit Professorship in Microelectronics. In 2013, I joined the University of Pennsylvania faculty as the Alfred Fitler Moore Professor of Electrical and Systems Engineering, and was named the founding director of the Singh Center for Nanotechnology at Penn.

6. As discussed below, my technical expertise is in microelectromechanical systems (MEMS), microfabrication technologies for MEMS, and the application of MEMS in multiple fields. A particular research interest area of mine is the application of microfabrication technologies to magnetics, including magnetoquasistatic problems such as those inherent in near-field wireless power transfer based on magnetic field coupling.

7. At the beginning of my academic career in 1989, I founded my research group, the Microsensors and Microactuators Group. This group, consisting of graduate students and postdoctoral associates of both the Georgia Institute of Technology and the University of Pennsylvania, has been in continuous existence

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