

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent of: David Champlin, et al.
U.S. Patent No.: 7,844,037 Attorney Docket No.: 39521-0050IP1
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Appl. Serial No.: 11/200,511
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Title: METHOD AND DEVICE FOR ENABLING MESSAGE
RESPONSES TO INCOMING PHONE CALLS

DECLARATION OF DR. NARAYAN MANDAYAM

1. My name is Dr. Narayan B. Mandayam. I am a Distinguished Professor of Electrical and Computer Engineering at Rutgers University. My current *curriculum vitae* is attached and some highlights follow.
2. I received a bachelor degree (with Honors) in 1989 from the Indian Institute of Technology, Kharagpur, and M.S. and Ph.D. degrees in 1991 and 1994 from Rice University, Houston, TX, all in electrical engineering.
3. I was a Research Associate at the Wireless Information Network Laboratory (“WINLAB”), Department of Electrical and Computer Engineering, Rutgers University, between 1994 and 1996. In September 1996, I joined the faculty of Department of Electrical & Computer Engineering at Rutgers where I became Associate Professor in 2001, Professor in 2003, and Distinguished Professor in 2014. I also served as the Peter D. Cherasia Endowed Faculty Scholar at Rutgers University from 2010 to 2014. Currently, I also serve as the Chair of the Electrical and Computer Engineering Department as well as Associate Director at

WINLAB where I conduct research in various aspects of wireless systems and networks. I teach courses at Rutgers on the topics of Wireless System Design, Wireless Communication Technologies, Wireless Revolution, Detection and Estimation Theory and Introduction to Computing for Engineers. I was a visiting faculty fellow in the Department of Electrical Engineering at Princeton University in Fall 2002 and a visiting faculty at the Indian Institute of Science in Spring 2003.

4. My research focuses on wireless networks and communications, and I have worked on various aspects of networking and wireless devices. Over the last 25 years, I have published a wide range of articles on various aspects of wireless systems, including techniques for data transmission, resource allocation strategies, mathematical modeling, and performance analysis. Using constructs from game theory, communications and networking, my work has focused on system modeling and performance, signal processing as well as radio resource management for enabling wireless technologies to support various applications. I have coauthored 2 books on wireless networks (Principles of Cognitive Radio, Cambridge (2012) and Wireless Networks: Multiuser Detection in Cross-Layer Design, Springer (2005)), 6 book chapters and published over 200 papers in prestigious international journals and conferences. I have also given numerous invited presentations at a variety of industry, government, and academic forums.

5. Specifically, I have been doing research in various aspects of wireless data transmission for over 25 years addressing PHY, MAC and Network layer issues. I have made seminal research contributions to wireless data communications on issues ranging from the systems level (such as power control, base station assignment, capacity evaluation, protocol design, medium access control, and radio resource management) to the physical layer (such as detection and estimation). I have also done seminal work in the area of the PHY layer security, where properties of the radio channel are exploited for the purposes of key generation, authentication and encryption. My expertise includes cellular systems such as for 2G, 3G and 4G and I have published papers on a wide variety of topics related to the design and operation of GSM/TDMA, CDMA and LTE based systems. During this time, I have also worked extensively on wireless local area network (WLAN) technologies as well as wireless ad-hoc and sensor networks, and as such, I am quite familiar with 802.11 and Bluetooth.

6. I also teach both graduate and undergraduate courses at Rutgers where I introduce students to the wide area network (WAN) cellular and local area network (LAN) technologies mentioned above. I have also served as a technical consultant since its inception in 2002 to the company Mojo Networks Inc., a world leader in enterprise network security for WLANs that offers the next generation of intelligent edge, secure, and flexible Wi-Fi solutions. I am familiar with the early

developments in the area of cellular systems (2G, 3G, 4G and 5G) and have served on several graduate thesis defense committees pertaining to all aspects of cellular systems operation.

7. I have received several prestigious awards relating to my research on wireless networks and communications: the 2015 IEEE COMSOC Advances in Communications Award for seminal work on power control in wireless data networks (this is the highest paper award given by the IEEE Communications Society), the 2014 IEEE Donald G. Fink Award (recognizes the most outstanding tutorial paper across all IEEE publications) for the paper titled “Frontiers of Wireless and Mobile Communications” that discusses the historical and future landscape of both WAN and LAN wireless technologies, and the Fred W. Ellersick Prize from the IEEE Communications Society in 2009 for work on dynamic spectrum access models and spectrum policy. I also received the Peter D. Cherasia Faculty Scholar Award from Rutgers University in 2010, the National Science Foundation Career Award in 1998, and the Institute Silver Medal from the Indian Institute of Technology, Kharagpur, in 1989.

8. I have served as an Editor for the journals IEEE Communication Letters (1999- 2002) and IEEE Transactions on Wireless Communications (2002-2004). I have also served as a guest editor of the IEEE JSAC Special Issues on Adaptive, Spectrum Agile and Cognitive Radio Networks (2007) and Game

Theory in Communication Systems (2008). I was elected Fellow of the IEEE for “contributions to wireless data transmission.” I have also served as a Distinguished Lecturer of the IEEE Communications Society.

9. My experience of nearly 30 years with networking and telecommunications in academic and practical situations as well as my hands on experience, has given me a detailed appreciation of the technology involved with the ‘037 patent.

10. In writing this Declaration, I have considered the following: my own knowledge and experience, including my work experience in the above fields; my experience in teaching those subjects; and my experience in working with others involved in those fields. In addition, I have analyzed the following publications and materials, in addition to other materials I cite in my declaration:

11. I have been retained on behalf of Apple Inc. to offer technical opinions relating to U.S. Patent No. 7,844,037 (“the ‘037 Patent” or APPLE-1001), and prior art references relating to its subject matter. I have reviewed the ‘037 Patent and relevant excerpts of the prosecution history of the ‘037 Patent (“the Prosecution History” or APPLE-1002). Additionally, I have reviewed the following:

- U.S. Patent No. 6,301,338 to Mäkelä (“Mäkelä” or APPLE-1004);
- U.S. Pub. No. 20040203794 to Brown (“Brown” or APPLE-1005);

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