

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent of: Dumas, et al.  
U.S. Patent No.: 9,057,210 Attorney Docket No.: 42746-0006IP1  
Issue Date: June 16, 2015  
Appl. Serial No.: 13/734,671  
Filing Date: January 4, 2013  
Title: WIRELESS ACCESS CONTROL SYSTEM AND  
RELATED METHODS

### DECLARATION OF DR. RICHARD T. MIHRAN

#### I. BACKGROUND AND QUALIFICATIONS

1. My name is Dr. Richard T. Mihran. I am a Professor Adjunct in the Department of Electrical, Computer and Energy Engineering at the University of Colorado at Boulder, where I have been on the faculty since 1990. I teach a wide variety of classes at the undergraduate and graduate level covering general electrical and computer engineering theory and practice, including circuit theory, microelectronics communications, signal processing, and medical devices and systems. Many of these classes incorporate lecture and laboratory components that include both hardware and software design. My *curriculum vitae* is submitted on the record as Exhibit ASSA-1025.

2. I have taught many classes at the undergraduate and graduate level covering analog and digital signal processing; radio-frequency identification devices; miniaturized devices incorporating embedded systems; and optics and optical electronics. I further regularly teach a course covering microelectronics

and semiconductor devices, including Bipolar Junction Transistors (BJT) and Metal Oxide Semiconductor Field Effect Transistor (MOSFET) devices, including transistor configurations utilized in digital logic circuits, processors, and semiconductor memory, such as various types of RAM, ROM and flash memory, and data storage and data transfers using these types of memories.

3. Many of these courses cover subject matter directly relevant to wireless communication devices and access control systems employing, for example, Radio Frequency Identification (RFID) and Near Field Communication (NFC) technologies, including principles of inductive, electromagnetic, and electrostatic coupling and energy transfer, carrier modulation and demodulation techniques, and methods on data encoding. These courses further include components and concepts directly relevant to electronic devices and systems and their interfaces with other devices, including communications networks, general principles of wired and wireless RF communications, and data signal modulation and encoding in a variety of applications.

4. I have also performed research and development in academic and industrial settings pertaining to electronic, optical and ultrasonic devices and systems for a variety of applications, including both hardware and software development, for over 30 years. As part of my faculty role at the University of

Colorado, I participate in the supervision of doctoral research performed by graduate students as part of obtaining their doctoral degrees.

5. With respect to the subject matter of the patent addressed in this Declaration, wireless access control systems are generally implemented using microprocessor-based designs along with supporting control and communication circuitry. I have been involved in the design and analysis of microprocessor-based devices and systems since approximately 1979, utilizing commercial microprocessors manufactured by Intel, Motorola, Zilog and Microchip, among others. Research projects I have directed involving such microprocessor-based systems include the development of RFID readers and transponders, spread-spectrum RF data telemetry devices, embedded system radar signal processing devices, biosensor and immunoassay devices, and microprocessor-controlled drug infusion devices. Many of these research projects have involved the development and/or analysis of communications transceiver devices utilized in systems for acquiring, processing, storing and retrieving data, as well as computational algorithms and analytical techniques implemented in both software and firmware on a variety of computing platforms, including embedded microprocessor systems and personal computers (PCs).

6. I have consulted extensively in the area of RFID systems, devices and networks used in wireless access control and other applications, for over twenty

years, including various forms of wireless devices using both near-field and far-field wireless communication technologies, including those having frequencies of operation of 125 kHz, 13.56 MHz, 800-900 MHz, and microwave frequencies.

7. I am an inventor on three issued U.S. patents and one Canadian patent associated with some of these activities, two involving computer-based Doppler radar signal processing and data analysis, and two involving data telemetry utilizing spread spectrum wireless links and database analysis systems for agricultural management.

8. Since obtaining my Ph.D. in 1990, I have actively consulted in industry in many areas of technology development, analysis and assessment, directed to both product development and analysis of intellectual property portfolios, patent infringement and validity. The fields of technology in which I have consulted and/or served as a technical expert include, but are not limited to, wireless smart card and Radio Frequency Identification systems; wired and wireless networking devices and systems; spread-spectrum data telemetry devices and systems; computer storage and data systems; and wireless telecommunications and networks.

9. I received a B.S. in Electrical Engineering and Applied Physics from Case Western Reserve University, Cleveland, Ohio in 1982. I further received an M.S. in Electrical and Computer Engineering and a Ph.D. in Electrical Engineering

from the University of Colorado at Boulder in 1988 and 1990, respectively. My professional and educational background, as well as a listing of other matters on which I have provided consulting and/or provided testimony as a technical expert, are detailed in my *curriculum vitae*.

## II. MATERIALS CONSIDERED

10. In writing this Declaration, I have considered my own knowledge and experience, including my relevant work, industry and academic experience detailed above. I have also considered and analyzed the publications and materials listed below. While I refer to various supporting materials throughout this Declaration, all of the analysis and opinions I express below are *primarily* based on my own knowledge and experience in view of the '210 Patent and the prior art references set forth in Exs. 1005-1010.

- U.S. Pat. No. 9,057,210, its accompanying prosecution history, and the supporting Provisional Appl. No. 61/453,737 (“the '210 Patent”, Exs. ASSA-1001, ASSA-1002, ASSA-1003);
- U.S. Pat. Pub. No. 2010/0075656 (“Howarter”, ASSA-Ex. 1005);
- U.S. Pat. Pub. No. 2003/0008675 (“Willats”, ASSA-Ex. 1006);
- U.S. Pat. Pub. No. 2010/0171642 (“Hassan”, ASSA-Ex. 1007);
- U.S. Pat. No. 6,034,617 (“Luebke”, ASSA-Ex. 1008);
- U.S. Pat. Pub. No. 2002/0099945 (“McLintock”, ASSA-Ex. 1009);

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